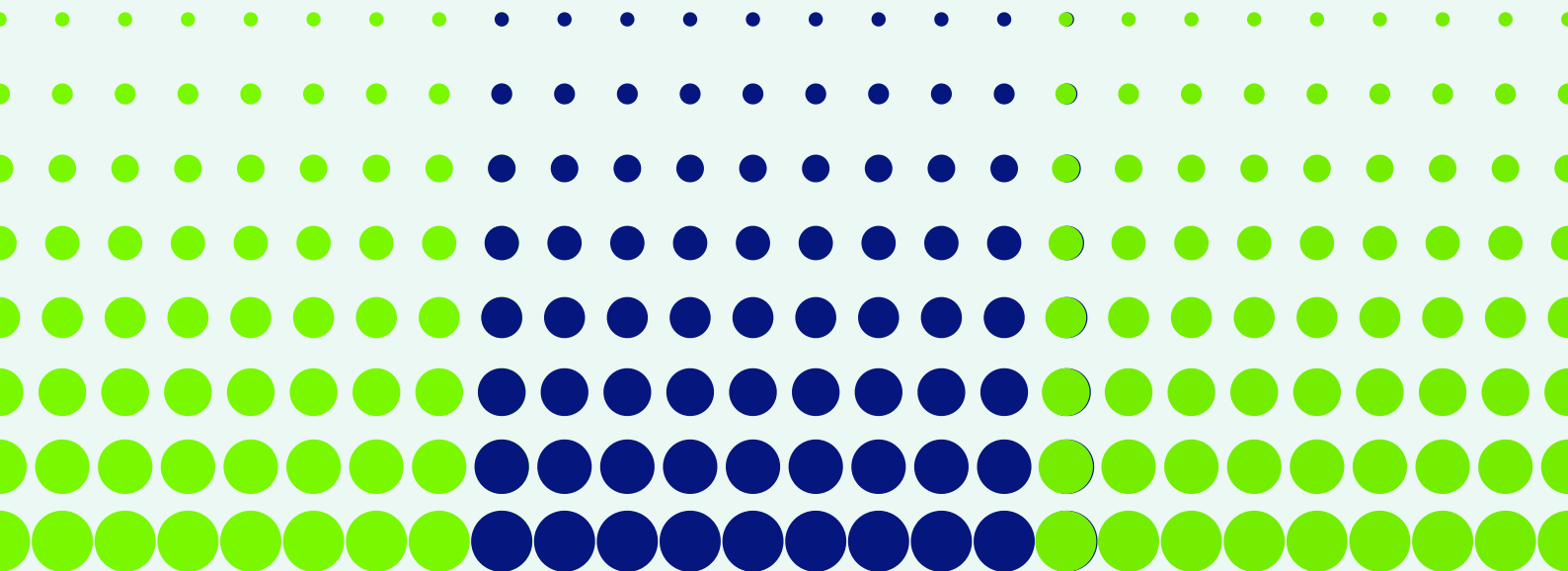




Development Discourse

**IRM Journal of Social Sciences &
Humanities**

**Summer 2020
Volume I, Issue No:1**



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**DD Journal
Summer 2020
Volume I, Issue No:1**

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DD Journal
Summer 2020
Volume I, Issue No:1

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ASSESSING ECONOMIC BENEFITS THROUGH WASTE EFFICIENT DRIVERS IN MEGA CONSTRUCTION PROJECTS: A CASE OF PAKISTAN

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Abstract

Waste disposal has become an issue worldwide and the major cause of this issue is considered to be the construction activities producing wastes. Pakistan being the 6 most populated country in the world is considered to have a huge amount of waste due to the various construction and particularly megaprojects and this amount of construction waste is increasing consistently in the country. Pakistan produces of construction waste per year and is increasing annually by 2%. These increasing wastes and issues associated with these construction wastes lead to a crucial need for improvement of waste management practices in the construction industry of the country through various measures. Despite of the large need for waste minimization research in Pakistan, , deductive approach was used, and quantitative method was selected, the present study has used cross-sectional design. The researcher used a sample of 323 individuals and conducted a questionnaire-based study.

Keywords: Construction Waste Reduction, Waste Efficient Bill Quantity, Effective Materials Delivery Management

Introduction

Construction waste has really become an issue in projects that are mostly caused by a number of activities and practices carried out in all stages of the process of project delivery. Many past researchers have focused their efforts on studying different construction stages of projects. However, few scholars studied material procurement processes and waste efficient drivers in order to diminish the possibilities of waste in construction projects. There is seen less focus of scholars on strategies formulation and execution for using waste efficient drivers in the projects for the sake of reducing construction costs of projects. In developing economies, waste recycling and disposal is really becoming a challenge. A huge portion of waste in those countries is not properly reused and discarded by construction firms thus creating difficulties for waste management by those firms (Maleka, Nyirenda, & Fakoya, 2017). The challenge of waste generation and disposal in Pakistan is also giving tough time and causing ecological pressure on the construction firms and projects operating in the country. The growing amount of waste materials have caused a big issue of sustainability for all the construction firms and construction projects. It has created a big chaos in various construction activities and practices in the Pakistan. Therefore, waste efficient practices and techniques are largely needed by those firms and projects in order to meet with this ecological challenge to enhance and achieve their economic (Ajayi et al., 2015). The solid waste created by construction projects and its processing is really a big challenge for the community and environment worldwide. This is because waste generation per capita is continuously facing incremental trend that seems a real-time challenge for construction project managers and firms and this challenge is more serious specifically in the developing economies of nations. Due to this increased challenge and issue in developing countries, particularly the construction firms in those countries are likely to face a large pressure in terms of environmental, social and economic requirements and responsibilities because they have to diminish the ecological impacts and ecological issues and problem possibly arising due to the operations and construction activities of those firms. For overcoming and reducing this ecological pressure, the construction firms really need such operations and practices that assist them to reduce their wastes and adverse impacts of those wastes on the environment. In the EU, a regulatory framework has been set up with the Directive 99/31/EC on landfill to comply with the 3R regulations (Reduce, Reuse and Recycle) aiming towards sustainable construction. (Calvo, Varela-Candamio, & Novo-Corti, 2014). The waste generates by construction and devastation activities in the construction industry needs to be diminished

because its reduction is beneficial to both the environment as well as construction firms. Its reduction contributes to the environment by eliminating ecological issues and hazards along with contributing to the firms by reducing their costs overall.

Scholars suggest that when construction firms or projects increase their expenditure on waste management. Similarly, its practices then are likely to come in a position to diminish their waste portion and their ability to achieve targets of waste lessening is expected to augment. Consequently, the achievement of targets regarding waste reduction incorporates various economic as well as ecological benefits for the firms or projects operating in the construction industry and their profitability is expected to augment (Maleka et al., 2017). Studies also suggest that when construction projects or firms focus their efforts on the process of material procurements in terms of waste reduction. They adopt such practices and techniques that have the ultimate effect of reducing waste and cost in the process of material procurement of construction project consequently making the project waste-efficient as well as cost-efficient in those processes. These waste-efficient processes of the material acquisition have a positive influence on waste minimization of construction projects (Ajayi&Oyedele, 2018). Due to the increased significance of the waste minimization for a construction firm from both economic and ecological perspectives, the need for research on exploring and analyzing various causative elements and precautionary measures for waste minimization has evolved and heightened. Many past scholars have conducted researches and also have given a call to future researchers to conduct studies on such instrumental factors. Additionally, measures at various stages of projects like plan & design, procuring & purchasing material as well as the construction stage in order to reduce the waste and to make projects or firm waste-efficient. The inadequate management of MSW is one of the principal challenges for African cities achieving ambitious sustainable development goals (SDGs). Sustainability entails processes and services that meet the needs of the current generations without compromising the ability to serve future generations (Aryampa, Maheshwari, Sabiiti, Bateganya, & Bukenya, 2019).

However, in contrast to the activities at the stages of specific design and construction (that have been largely examined and analyzed in terms of making projects waste- efficient), limited research has been performed on the waste efficiency through the material procurement process and waste efficient drivers of construction waste and cost minimization. Following four vital waste efficient drivers and factors in process of material procurement and acquisition have been recognized in the literature that need investigation ad further confirmation in terms of their contributive role in diminishing construction waste and cost of

projects to have ultimate positive influences on success and economic benefits of the construction project: (Ajayi&Oyedele, 2018).

- ‘Suppliers’ commitment to low waste measures’ (SCLWM)
- ‘Low waste material purchase management’ (LWMPM)
- ‘Effective material delivery management’ (EMDM)
- ‘Waste efficient bill of quantity’ (WEBOQ)

Problem Statement

The waste disposal has become an issue worldwide and the major cause of this issue is considered the construction activities producing wastes. The waste produced by construction practices in the construction industry needs to be reduced because its reduction is necessary for the atmosphere. Training and education is another effective way of minimizing waste generation (Udawatta, Zuo, Chiveralls, &Zillante, 2015). Pakistan is considered to have a huge amount of waste due to the various construction and particularly megaprojects and this amount of construction waste is increasing consistently in the country. These increasing wastes and issues associated with these construction wastes lead to a crucial need for improvement of waste management practices in the construction industry of the country through various measures. Furthermore, the literature on waste minimization in the context of Pakistan is limited and no study is found to give insights and assistance about waste minimization in the construction projects particularly undertaking in Pakistan. This gap of research really needs to be filled with empirical research.

The proposed study will try to find a solution to the above problem by working on the following research objectives in the context of Pakistan:

- To check the relationship between suppliers’ commitment to low waste measures (SCLWM) and construction waste reduction.
- To check the relationship between low waste material purchase management (LWMPM) and the construction waste reduction.
- To check the relationship between effective materials delivery management and the construction waste reduction.

- To check the relationship between waste efficient bill of quantity (WEBOQ) and the construction waste reduction.
- To check the relationship between the construction waste reduction and the economic benefits to the construction project.

Literature Review

The Pakistan is facing the serious challenge of waste and its disposal particularly at construction sites and it is deliberated as one of the major producer states of waste. According to the Pakistan Interact (2007), 75 percent of the total waste produced in the Pakistan is considered to be produced by the construction industry. In terms of waste proportion per capita, Pakistan comes at the second number to the USA in the ranking of all countries of the world according to the waste share per capita. Pakistan is expected to have a large number of landfills for the dumping of huge amounts of construction waste and this amount of construction waste is increasing day by day in the country. In addition, a study has shown that construction waste minimization also needs to focus on the design stage of pre-construction projects, which can directly reduce construction waste from sources (Wang, Yu, Tam, Li, & Xu, 2019). These increasing wastes and issues associated with these construction wastes cause an urgent need to arise for improving waste management in the construction industry of the country through waste efficient techniques and processes. As the construction industry of PAKISTAN is booming extraordinarily due to a large number of mega projects and construction contracts that in turn are likely to enhance the waste and ecological concerns, therefore, the need for improving the positive attitude of builders and construction contractors towards waste management and its measurements has augmented. Many prior studies suggested the need for ecological concerns arising due to such mega projects in Pakistan (Lin & Raza, 2019).

Constructions wastes are actually the by-products produced and eliminated from construction, restoration, and destruction at factories or at sites of construction or at public manufacturing structures. Construction waste is described by Environmental Act (1990) as, “Scrap material or effluent or other surplus substances arising from the application of any process.” The construction waste is produced at various stages of a construction project that needs to be reduced at each stage in order to achieve overall waste reduction targets. The past studies suggest many source factors for construction waste but the four main source factors and activities of waste generation in a construction project. There are dominant and recognized in the literature that is ‘design, procurement,

holding of material and operations of construction' When performing the stage of design of a construction project, a huge amount of waste produces due to several design issues (Huang et al., 2018). It is revealed in past literature that the design of construction projects has a major impact on construction waste thus requiring designers to use models for producing designs that are waste efficient. In this way, the waste minimization process is encouraged and started at the starting stages of the construction projects. On the other hand, the lack of effective regulation is not the root cause of these disparities in Europe. The relationship between environmental innovation and policy is also important (Le Hesran, Ladier, Botta-Genoulaz, & Laforest, 2019).

Waste minimization is about the set of activities carried out to diminish the waste. The activities that are encompassed in waste minimization are first of all waste inhibition in which the construction waste is prevented to be produced, secondly re-use of waste produced and thirdly, the recycling of waste to convert it to something useful. The waste inhibition can be achieved through waste efficient drivers at construction sites. These drivers may encompass industry, governmental policies and constraints, economy and environmental principles. The government may induce waste minimization in construction projects through various strategies and tools including policies, contracts, etc (Umar, Shafiq, & Isa, 2018). Some environmental standards serve as means for construction projects and firms to diminish their waste generation and its impact on the environment as well as to induce their waste minimization.

There are many financial advantages associated with waste minimization because there is a huge cost that is incurred for waste disposal. Therefore, if a construction project or firm works on waste minimization in the stages of the project then it can avoid that huge cost associated with waste disposal. These financial benefits enhance the economic worth of waste minimization along with its ecological worth for firms. A large number of studies have been performed in order to examine the significance of waste minimization, its various drivers and their contribution towards economic benefits to the construction projects or firms (Ajayi&Oyedele, 2018). However, no such research has been performed in the context of Pakistan and Pakistan to investigate these phenomena in the construction projects undertaking particularly in Pakistan.

The planning of material logistics has gained increased importance in construction projects because it can act as a strategic device for the effective operations and

management of the construction projects. Material logistics planning is actually about the management of a set of activities involved in the purchase of material, its storage, its wastage and disposal, its alteration and its delivery. The activities involved in this whole process are covered in material logistics management. Its proactive and effective management is likely to enhance economic benefits for the projects by decreasing cost. Along with cost-saving benefits, it is also expected to have a contribution towards the environmental performance of the project by realizing the sustainability of the construction environment. The enhanced contribution of the management of material logistics towards environmental stability has galvanized the increased awareness about the environmental effects of material logistics (Guzzo, Trevisan, Echeveste, & Costa, 2019). Along with environmental impacts, a large number of past studies are found in the literature that suggests the importance of material procurement measures and their proper management in promoting construction waste and cost reduction. The critical measures used in this process have the potential to diminish the cost and waste of the construction project. Procurement measurements can serve as significant tools for waste minimization in the purchase material stage thus contribute to the overall waste reduction of the project throughout the supply chain.

There are four significant measures recognized in the literature that can assist firm or projects to achieve a waste reduction in material procurement process i.e. the commitment of suppliers towards waste efficient measures, waste efficient purchase management, effective material delivery man agent and low waste bill of quantity (Ajayi&Oyedele, 2018). The SCLWM requires the suppliers to be flexible for supplying varying quantities, the modification and alignment of products with design, determination for plan take back for recycling and reusing materials, providing quality product and avoiding the use of extra packaging. When these measures are adopted at the stage of material procurement then potentials of cost and waste saving enhance. Therefore, the first hypothesis of the current study will be:

LWMPM measure in material procurement enhances the acquisition of such materials as well as technology that is waste efficient and incur a minimal cost and waste at the construction site. It promotes the acquisition of the secondary material for recycling and reusing it. The purchase of such material is encouraged through LWMPM measure that material is suitable, correct and is of good quality in order to avoid the waste and extra cost required for its alteration and any other logistics management (Ajayi&Oyedele,

2018). The proper adoption and management of these measurement activities are likely to diminish the construction waste of the projects. So, the second hypothesis of the current study will be:

EMDM measure is also very important for decreasing the waste portion in the procurement process and in the overall construction. Through this measure, the material is properly endangered during the whole process of transportation, stacking, releasing, etc. for avoiding any waste or cost. The delivery schedules are effectively formulated and applied in order to avoid any delay in the procurement process. The most effective measure that is used under EMDM is the use of 'Just in time inventory' in which the chances of waste of material as well as cost decrease (Ajayi&Oyedele, 2018). These all measures are very likely to have potentials for waste as well as cost minimization in the whole process. Thus, the third hypothesis of the current study will be:

The consideration of WEBOQ requires the procurement process to take off correct materials and to avoid extra or less ordering. It enforces the managers to order the appropriate amount or quantity of material that is exactly required for the construction process instead of under or over-ordering. When the bill of quantity includes the consideration of waste efficiency then it bounds the managers to minimize the allowance for waste. All these practices in this measure, in turn, contribute towards minimization of the waste and cost in procurement processes (Ajayi&Oyedele, 2018). Thus, the forth hypothesis of the current study will be:

The construction waste reduction achieved through various measures then, in turn, has the potential to generate many economic benefits for the projects. It augments the chances of cost cut due to the waste minimization and efficiency of the stages of the project. These cost cuts ultimately enhance the profitability of the construction projects or firm. Therefore, it is suggested that waste reduction is likely to generate several economic benefits the profitability from which seems a prominent economic benefit (Platonova, Asutay, Dixon, & Mohammad, 2018).

Methodology

Quantitative method is selected because this study give us the findings of results by descriptive statistics for the sake of getting the relationship of variable with another variable

and to identify the effect of one variable on other. Quantitative method is used because of minimum budget and time. Because as discussed earlier qualitative needs extra time for interviewing, and getting a common result by different opinion. Other reason of choosing quantitative is to avoid biasness in research. Sample size relays on selected target population, technique of analysis, time and resource availability. Sample size is selected is 350, almost 400 questionnaires were distributed and response from 323 respondents was received. Data is collected through survey based questionnaire from the construction industry of Pakistan.

Discussion and conclusion

The purpose of this study was to assess the economic benefits through waste efficient drivers in mega construction projects in context with the Pakistan. Our first hypothesis was Suppliers' commitment to low waste measures (SCLWM) has a positive and significant influence on the construction waste reduction. According to the results of structural equation modeling the hypothesis has been accepted. In past research ([Paz & Lafayette, 2016](#)) has also tested this hypothesis which was accepted. Our second hypothesis was low waste material purchase management (LWMPM) has a positive and significant influence on the construction waste reduction. According to the results of structural equation modeling the hypothesis has been accepted. In past research ([Barbudo, Ayuso, Lozano, Cabrera, & López-Uceda, 2020](#)) has also tested this hypothesis which was accepted. Our third hypothesis was Effective materials delivery management has a positive and significant influence on the construction waste reduction. According to the results of structural equation modeling the hypothesis was accepted. In past research ([Galán, Viguri, Cifrian, Dosal, & Andres, 2019](#)) was conducted in which same hypothesis was accepted. Our fourth hypothesis was Waste efficient bill of quantity (WEBOQ) has a positive and significant influence on the construction waste reduction. According to the structural equation modeling this hypothesis was rejected. In past researches ([Hoang, Ishigaki, Kubota, Yamada, & Kawamoto, 2019](#)) this hypothesis was also tested which was rejected. Our fifth hypothesis was Construction waste reduction behavior has a positive and significant influence on the economic benefits of construction waste minimization. According to the results of structural equation modeling the hypothesis has been accepted. In past research ([Esa, Halog, & Rigamonti, 2017](#)) has also tested this hypothesis which was accepted. Our sixth hypothesis was construction waste reduction behavior has significant mediating role in the relationship between supplier's commitment to low waste measures and economic benefits of construction waste minimization. According to the results of structural equation modeling the hypothesis has been accepted. In past

mediating role with the independent and dependent variable has not be checked but studies has been conducted discussing these variables individually which rely with our results. Our seventh hypothesis is Construction waste reduction behavior has significant mediating role in the relationship between low waste material purchase management and economic benefits of construction waste minimization. According to the results of structural equation modeling the hypothesis has been accepted. In past ([Huang et al., 2018](#)) mediating role with the independent and dependent variable has not be checked but studies has been conducted discussing these variables individually which rely with our results. Our eight hypothesis Construction waste reduction behavior has significant mediating role in the relationship between effective materials delivery management and economic benefits of construction waste minimization. According to the results of structural equation modeling the hypothesis has been accepted. In past mediating role with the independent and dependent variable has not be checked but studies has been conducted discussing these variables individually which rely with our results. Our ninth hypothesis is construction waste reduction behavior has significant mediating role in the relationship between waste efficient bill of quantity and economic benefits of construction waste minimization. According to the results of structural equation modeling the hypothesis has been rejected. In past ([Akinade et al., 2016](#)) mediating role with the independent and dependent variable has not be checked but studies has been conducted discussing these variables individually which rely with our results.

Conclusion

In the proposed study, the impact of economic benefits was assessed on the material procurement measures by keeping construction waste reduction behavior as mediator. This was investigated in the context of Pakistan. Results shows construction waste reduction behavior has positive impact on supplier commitment to law waste measures, low waste material purchase management, waste efficient material delivery management for gaining economic benefits. While waste efficient bill of quantity does not seems to be impactful in the construction industry of Pakistan. By applying the material procurement measures discussed in the study economic benefits and the construction waste reduction behavior can be achieved. It will be a quantitative study that will contribute theoretically to the literature of waste reduction and will enhance its scope by checking its applicability in Pakistan.

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**CORONA PANDEMIC: ANALYZING THE RESPONSE OF
US, CHINA, RUSSIA, INDIA AND PAKISTAN**

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Abstract

This article is an effort to examine socio-political and economic impact of COVID-19 to state system global politics. Further, this study analyzes the response of US, China, Russia, India and Pakistan to Covid-19.

Introduction

Starting in December of 2019, first suspected as a mild cold in a seafood merchant of Hua'nán market was proved to be a fine example of “Butterfly” or you may call it “Domino” effect. At first it was taken by the world community an epidemic later regarded as a global pandemic engulfing over million of earthlings in matter of days, responsible for seizing its originating country and crippling the world’s economy. As this viral pandemic started to grow people around the world began to speculate its causes, its immense socio-political effects and daily increase in number of patients by many folds. But there is something else that spread earlier than virus, COVID-19, itself and that is the “panic” caused by it. And there is the reason for this panic, COVID-19 single-handedly became a cause of decease for nearly 30,000 people in just three months, while hospitalizing half a million (ABCnews). States, that were not yet recorded any case or effect, began to formulate emergency responses, markets around the world saw momentous outrun of sanitizing products and some started to fabricate it as a biological war that would be limited to a certain region or country. While some states that didn’t consider it as deadly or longed for epidemic to enter their borders to drive any action, COVID-19 proved to be very harsh on them.

Analyzing the response of US, China, Russia, India and Pakistan

In China, Initially the response of Chinese government was measured; the authorities suppressed the voices of citizens as well as doctors regarding this deadly disease in Wuhan. Authorities turned deaf years toward the warnings of doctors by saying labeling their warnings as “lies”. This outbreak is not recent, but since December, Ophthalmologist Li Wenliang signaled that a group of doctors as well as the seven whistleblower scolded by the Chinese authorities for the sake of spreading illegal and misinformation vis-à-vis a virus on social media, that’s shows there was something that has been occurring internally in Wuhan that was not spread publicly.

When the disease declared publicly, at central level under the chairmanship of Chinese Premier Li Keqiang a meeting organized on January 25, 2020. After that meeting two days later Chinese Vice Premier Sun Chunlan visited Wuhan in order to guide the work to eradicate epidemic in Hubei province, in the fight again this pandemic the model that was adopted after 2008

Wenchuan earthquake again implemented. Under this model, the 16 provinces will provide support to the cities that are outside Wuhan which means that one province will be united with one city. In the response of such epidemic Government established two hospitals Houshenshan (Fire God Mountain) Hospital and Leishenshan (Thunder God Mountain) Hospital within 10 days. These two hospitals were established only to treat coronavirus patients. Cities also made strict control over the exchange of personal travel and exchanges. (TheDiplomat, 2020/02)

In the hours of dire need, Indian government was the first on which provided 15 tons of medical assistance that was consist of masks, gloves, and other equipment to China on 26 February 2020. (CNBC, 2020/03).

In Us, on state level, many bills as well as legislatures has been passed at central level in the fight against this epidemic. State or Public health emergence declared in each and every territory of state in response to such virus. Almost 32 states introduced legislature including resolutions and bills which consists of funding, disease surveillance, medical coverage, isolation and quarantine all are part of the actions taken by governors in state of emergency. The approach that has been used at state level is whole-of-America Approach, an economic package formulated for the infectious persons (TheDiplomat,2020/02).

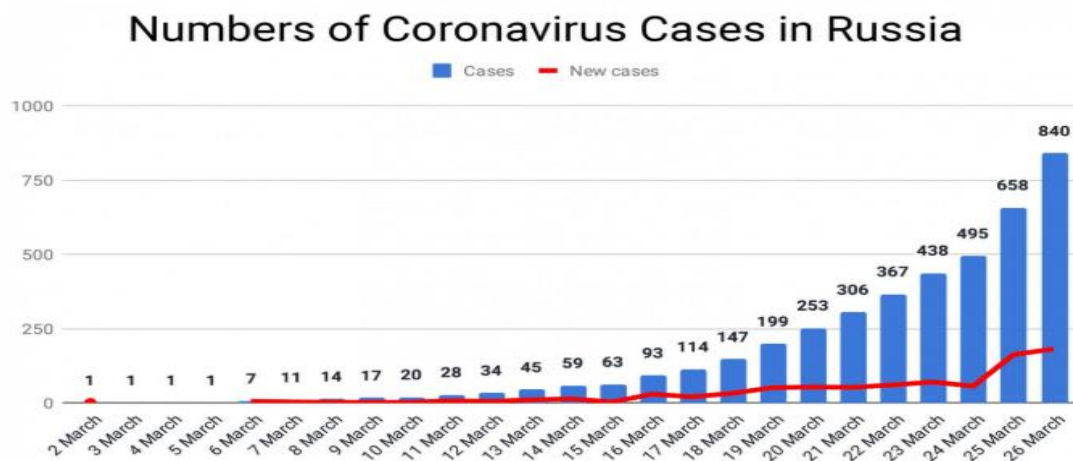
At national level, new guidelines were introduced, which included the ban over traveling, shut down bars, closing schools as well as food courts etc. for 15 days. It was also allowed the no permission is required in order to fulfill the growing demand of respirators from federal. Trump signed a coronavirus relief package that contains free test of the patients of COVID-19 In a speech Trump said that “Gatherings Should Be Limited to 10 People”

The economy of US affected drastically by this virus as the oil prices slid below \$30 a barrel, large business groups and local groups are begging the federal government to pay trillion of dollars in order to pay the salaries of workers that are stayed at home. Workers who are affecting by Coronavirus and staying at home would get 2-3 of their pay. (CNN, 2020/03/18). The Kentucky Derby first time in history postponed that was supposed to held in first Saturday of March but now it will take place in September, this race was suspended firstly in 1901 and then in 1945 due to WWII. (NYTimes, 2020/03/16). US administration is actually using the Defence

Production Act under which the center would request to pharmaceutical companies to boost the supply of Coronavirus supplies to treat COVID-19 patients. In a tweet Trump said:

“I only signed the Defense Production Act to combat the Chinese Virus should we need to invoke it in a worst case scenario in the future. Hopefully there will be no need, but we are all in this together” (TheVox, 2020/03/18).

In Russia, since the spread of corona virus not limited to China but its blowout globally, Russian was also affected as 840 cases of Corona virus confirmed in Russia. On national level government shut down all the flights to other countries since March 27, all the shops have been closed on the direction of government only pharmaceutical and grocery stores will be open. All the cultural festivals and large gatherings were strictly banned by the government. The health sector is urging the patients of those mild infections to recover at home rather than admitting in hospitals. The Republic of Chechnya is the first region under the Russian control where complete lockdown has been observed because the first case of corona virus identified at this region. (TheMoscowTimes, 2020/03/26).



(Source: The Moscow Times)

According to economist Luis Garicano, the epicenter of this virus is being shifted towards Europe, that's why lockdown is being practicing in almost every state. With this shift the supply chain is also being stagnate, no one is sure when it will completely be eliminated but its consequence are so deep in the term of economy, it is expected that its aftermath would be much more severe than the financial crisis of 2008.

President of European Union Ursula von der Leyen also formulated a comprehensive response in fight against this deadly virus, that response composed of measures such as, ensure the supply of medical equipment across the Europe, on the fiscal rule complete flexibility was given to all the European Union nations, for the support of health sector as well as small businesses EUR 37 billion Coronavirus Response Investment Initiative introduced, for the protection of borders a comprehensive guideline granted to all state in the form of suggestions such as ban on exchange of citizens over borders, it make a strictly prohibited non-essential flow of travelers to EU. The mechanism for the Crisis coordination of Commission has been activated and the meeting of the members made mandatory in the context of this outbreak. (Europa, 2020).

India is largest state after China in the term of population, it a union consists of 28 states and 7 territories, the Seventh Schedule of Indian constitution empowered both the union as well as states to formulate policies on the affairs of public health independently. The Union law deals only with the port quarantine means all the affairs that are related to seaman's and marine hospitals are fall under the jurisdiction of Union, on the flip side, all the affairs such as hospitals, dispensaries, sanitation and public health came under the control of state government but it is the mutual responsibility of state and union to prevent transmission of disease from one state to another.

On national level, on the direction of Prime Minister Modi, a group of ministers (GOM) established in order to supervise and review all the measures taken by Indian government in the wake of this coronavirus outbreak. Government made restrictions over traveling, visas suspended; only the diplomats and the government officials can travel abroad. For Overseas citizenship of India card holders' visas also suspended till April 15, 2020. For 21 days nationwide lockdown imposed in the state on the direction of Prime Minister. He said that "Every state, every district, every lane, every village will be under lockdown," (NYTimes, 2020/03/24).

Due to the proximity of Pakistan with the epicenter of this deadly virus i.e China, and with the state that is second largest in coronavirus cases after China i.e Iran, the treat for Pakistan is very visible as Pakistan shared its border with these two states. Initially no case was reported in Pakistan, but after the influx of passengers from abroad, this virus started penetrating in Pakistani society and more than 1,000 cases has been reported since last three weeks, this ration is

reaching its peak with each passing day. In this state of emergency, Pakistani government formulated a National Action Plan for Corona virus disease (COVID-19) Pakistan, this 136 pages documents consists of all the measures as well as guidelines for citizens. The response of Pakistani government is considered to be the “timely” best national response” in the overall world. Dr Palitha Gunarathna Mahipala, the country head of WHO said that “at a time when other countries were reporting cases, Pakistan was keeping the virus at bay, which is something quite praiseworthy.”

“At the moment, Pakistan has seven diagnostic labs which are capable of conducting 15,000 tests, but there is a need for more diagnostic facilities in case the number of suspected patients go up,” (TheGulfNews, 2020/03)

In the case of Iran, initially the situation was alarming because government did not take it seriously, no particular actions in the context of coronavirus has been taken by Tehran. The below picture that has been taken on March 18, 2020 depicts, the irresponsible behavior of government, this heavily crowded highway between Tehran & Qom that are epicenter of this



deadly virus is raising serious questions regarding government efforts, in its fight against coronavirus. (Source: BBC News)

Since the increase in the death toll and reported case, a seriousness has been observed in the behavior of state, all the educational institutions, and public gathering spots have been closed by the government, all the religious and cultural practices have been suspended in the state for 15

days. (BBCNews, 2020). One of the reasons for fragile state towards this deadly disease is US imposed sanctions on Iran, that's why state is unable to facilitate the bulk of patients.

There are many reasons that why creating a vaccine for virus would take billions of dollars and unexpected time. COVID-19 is new, how it behaves, reproduces and spreads is still ambiguous to scientists around the world. The most common way of making vaccines is called "attenuated vaccines" (WeForumOrganization, 2020/03). This way includes injection of tiny dosages into body, prepared outside by a weaker strains of actual pathogens. The trials of vaccinations need a lots of test, vaccines must be meticulously tested to assure their working and see if there is any side-effects.

States around the world, joining hands with various welfare organizations and qualified teams of scientists are working to create experimental vaccines. Total number of research groups, industries and pharmaceutical companies working to cultivate vaccine, listed by WHO, are currently 41. Here let us see an overview of some of such exertions:

Professors at London school of Hygiene and Tropical medicine are working with Moderna, a biotech agency working in Cambridge, Massachusetts. Moderna is currently funded by USNIH. Scientists and professors working there consider themselves in a race and working to include all possible options and platforms for development of vaccine.

Organizations like Bill and Melinda Gates Foundation funded spin-out companies like: DIOSynVax. DIOSynvax was also funded by UK innovation agency (UKIA) to develop new and better vaccinations for influenza and Ebola virus. Now, with again funding of UKIA, DIOSynVax has sharpened its focus on developing of vaccine to counter COVID-19 only.

Another effort by UK is from researchers at Oxford University. They are planning to start first trails on human in start of May. The essence of virus they are using is created artificially, unable to replicate in human body. This is rumored to be the top dog vaccine produced in UK.

Germany is also heading forward in this race. African based foundation CEPI or Coalition for Preparedness Innovation funded an enormous amount of about \$8 million to a German based CureVac. European Investment Bank also offered CureVac a loan of about 80 million euros. This company came into spotlight as President Donald Trump tried to get his hands on the

company because of its advance technology and high-end laboratories. The largest shareholders are billionaires Dietmar Hopp and Bill Gates.

Another German based company, BioNTech is testing its fortune for developing mRNA vaccine. Company was in agreements with Pfizer, a Shanghai based pharmaceutical company and recently tested on mice in lab in Mainz. They are scheduling to test on humans in April (ScienceBusinessMag, 2020).

China has established a six month trial program for testing of an experimental vaccine, with help of biotech CanSino Biologics based in epicenter of pandemic, Wuhan. Eight candidates were recently recruited in the program.

Funded by USA and government, Migal-Galilee institute in Israel is also working to provide with their version of vaccine. This institute already hailed a scientific breakthrough early this year by isolating COVID-19. Human trials are expected to start by end of April.

State and federal government in Australia provided University of Queensland with almost \$17 million to mark their flag in race. Other shareholders are CEPI and Paul Ramsay foundation. They claimed to produce vaccine in early of 2021 and six more months to start human trials.

Investment of Canadian government is over \$23 million over its vaccine manufacturer VIDO-InterVac. VIDO-InterVac previously produced successful vaccine for SARS and Zika Virus. This institute is working swiftly and claimed to produce testing vaccinations in less than 3 weeks.

With all these developed countries, contributing in development of vaccine the part of USA is comparatively more. It seems like the superpower is way ahead in this race with large investments not only in local companies but in firms abroad, including UK, Israel and Australia. Other USA-Based companies are Johnson & Johnson, Novavax, and Inovio Pharmaceuticals (ScienceBusinessMag, 2020).

With the spread of COVID-19, many conspiracy theories began to circulate. The prediction of spread mentioned in a novel written back in 80s to accusation on Chinese scientists in Canada working on some deadly viruses and pathogens, possibly making a bioweapon (TheDiplomat, 2020/03). These conspiracies have their effects on official arrangements of states as-well. Chinese administrators are blaming USA army for bringing the virus in mainland China and

Tweets by USA president renaming COVID-19 as “China Virus”. Question arises that why people around the world find it comfortable to share an idea of conspiracy, blaming states and institutions for creating and spreading of COVID-19? Answer may not be difficult if we set sail to debunk such theories.

Particular outcome of such theories, when they began to circulate in society, is it tears down trust of people on their governments. Many revolutionaries sees it as an opportunity to get in control with valid arguments. For example recent data from PEW research institute in USA estimated that about 29% of public in USA considers COVID-19 as a bioweapon. This number may seem comparatively small but when it comes to the government institutions and the orders of staying isolated and avoid gathering, people show distrust and consider it as a suppression by government. Another report by ‘the Verge’ (TheVergeMagazine, 2020/03/20), shows the confusion complex in people. As the spread was rapid and decisions taken by states were aggressive and strict, general public felt vulnerable, they began to gravitate towards any idea that provides them with any logical explanation, so why not a conspiracy that grips their minds with valid arguments.

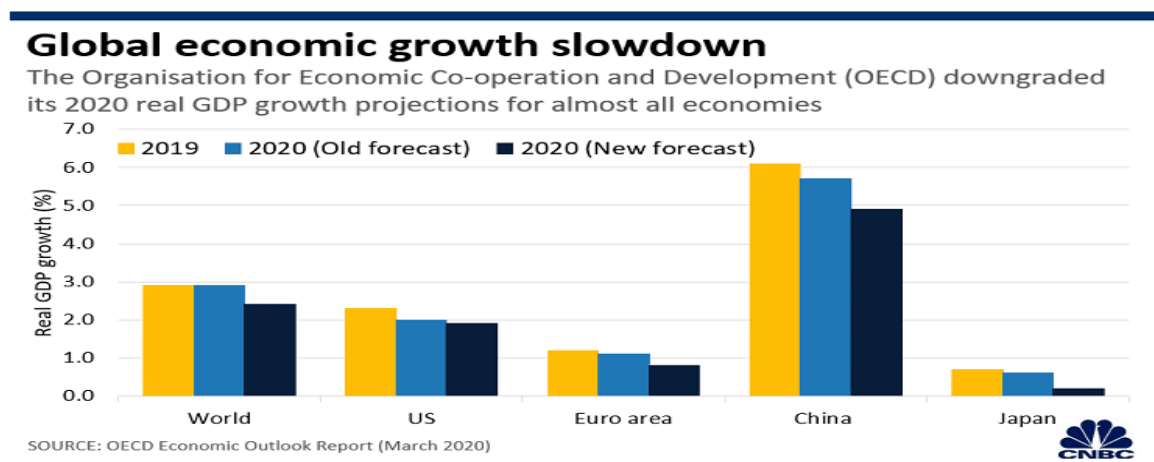
But then there are governments that are now pushing these conspiracies (TheBulletin, 2020/03), for example the USA politicians adding to the flames by blaming China as the mastermind behind virus and bioengineered it. This gives theories an escape point that these conspiracies are not fabricated by some random person with a laptop and internet connection but by governments to gain maximum public support.

Now, if we talk about China and its response, we have to look before the spread of epidemic. Relations between USA and China were actually quite worse. Administrations on both sides found this epidemic as another opportunity to further deteriorate this relationship. One cannot easily comprehend that the government officials are so prone to discuss conspiracy and thus blame each other on international forums. For example the blame on American visitors in November of last year who came to China with lungs illness or the use of E-cigarettes is the cause of COVID-19. It was the USA policy makers and politicians who brought China into this nasty debate and blame-game first. For instance, Pompeo called COVID-19 as ‘Wuhan Virus’ (TheEconomicTimes, 2020/03) which provoked the people and government of China and in response Chinese ministry of Foreign Affairs criticized USA and President Donald Trump

through media channels i.e CGTN for talking racism and complimenting xenophobia during crisis with no action in terms of aid and assistance.

In amidst of crisis governments, policy-makers and politicians must not overlook the fact that these conspiracies can damage social support required to fight the virus. Aid and assistance to potentially poor states is imminent while there is always a chance for a new theory to venture. Head to head rivalry of USA and China can overturn to other states like UK and Italy and with the increase in this tussle can China blame Angela Markel for bringing the virus to Wuhan in her visit last year?

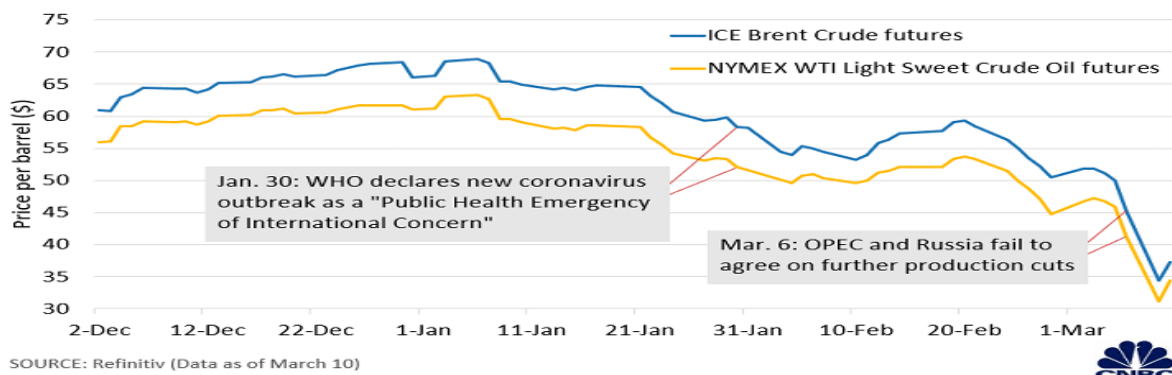
Globally very deadly impact has been observed of this global pandemic, this virus became one of the largest threats to the economies of the world and financial markets. According to Ben May, head of global macro research at Oxford Economics: “from an economic perspective, the key issue is not just the number of cases of COVID-19, but the level of disruption to economies from containment measures,”



According to OECD economic outlook report of March 2020, a visible change has been observed on the overall economic growth, fig. 3 and 4 describe this case. (Lee, 2020)

(Source: OECD Report)

Slump in oil prices



(Source: Refinitiv, Data as of March 10)

One thing we certainly know about COVID-19 is that it can be avoided, just like any other plague we are determined to find its cure someday soon but before getting our hands on vaccination we must externalize this issue and deal it for the betterment of whole humanity, not for a specific nation or for any particular interest. We must not give any space to conspiracy, particularly in these hours of panic and crisis. Great Powers must help incapable states in form of medical aid and assistance rather than treating this epidemic as a stage to perform political acts. A comprehensive and whole-of-globe approach is required in the fight against this virus. Whatever the case is, it eventually comes down to us and how we deal it, we must listen to authorities and hope for a better future.

Pakistan Response to Corona Pandemics and its Impact on International Relation

As of 26 March 2020, the number of confirmed cases in the country is 1,179, with 21 recoveries and 9 deaths. World Health Organization has appreciated Pakistan for taking meaningful and timely steps deal with Corona Virus. However the gradual but strict steps of Pakistan and economic vulnerability are border oriented thus impacted Pakistan's international connectivity and relations even with 'iron-friend' China and brotherly countries like Afghanistan, Saudi Arabia and Iran. Pakistan has requested for technical and equipment from other countries like Germany and Turkey as well. The Corona Pandemics has impacted Pakistan's economy therefore it is now looking towards International Financial Institutions like IMF, World Bank and Asian Development Bank.

Flight Operations:

The Pakistan Civil Aviation Authority (CAA) initially introduced screening measures at Islamabad, Karachi, Lahore and Peshawar airports for every passenger arriving from China. But as the Corona Pandemic situation gets worsen internationally, the Pakistan International Airlines (PIA) decided to suspend the flight operation between Pakistan and China, Saudi Arabia, USA, Europe and other parts of the world.

Land Borders

Pakistan closed its borders to travelers from Afghanistan at the Chaman border. The border is only partially opened for transportation of food items while pedestrian movement remains suspended. The same Strategy is also applied to the land border with Iran. Further, Pakistan-China, and Pak-India Borders have also been closed for two weeks.

Economic Relief Package and Medical Assistance

Lieutenant General Muhammad Afzal, the NDMA chairman, announced that the government is working on securing resources for healthcare workers. So the federal government requested to China and Germany for ventilators, medicines and other medical equipment to deal with Corona Pandemic effectively.

The Republic of China has declared to send 200 of its expert physicians to Pakistan amid the outbreak of the coronavirus. Economic Affairs Minister Hammad Azhar declared that China has provided aid worth \$4 million to Pakistan, alongside 14 metric tons of PPE, including face masks, thermometers, gloves and gowns and ventilators.

The federal government sought \$10 million from the non-development funds of the World Bank and offered financial assistance to Sindh.

The Foreign Minister Shah Mehmood Qureshi raised the issue of external debt faced by Pakistan and how it should be relieved in repayment of loans on the phone with Heiko Maas, the German Foreign Minister. Qureshi reportedly told Maas that united efforts were required for dealing with the pandemic and that debt relief could help Pakistan in better handling of the outbreak in the country. In response, Maas assured him that the issues would be raised at the forthcoming G7 meeting and the European Union Foreign Ministers' Conference.

Role as Responsible Regional Player

on 24 March the Foreign Minister of Pakistan further communicated with French Foreign Minister Jean-Yves Le Drian and the Spanish Foreign Minister Arancha Gonzalez that Iran neighbors Pakistan and people have cross borders traveling for religious activities therefore Iran's bad conditions can impact adversely therefore economic sanctions on Iran should be lifted immediately so it could utilize its own resources to fight the ongoing outbreak there. Mr. Mass also echoed the need to lift sanctions on Iran on calls with the

Conclusion

The efforts to deal with Covid-19 by states with the help of World Health organization (WHO) are admirable. WHO is urging all countries to prepare for the potential arrival of COVID-19 by readying emergency response systems; increasing capacity to detect and care for patients; ensuring hospitals have the space, supplies and necessary personnel; and developing life-saving medical interventions. States in their own operational capacity are working around; Preparedness & Response, Containment and Mitigation.

However, the states are recommended to work on the following areas to enhance capacity to deal with Covid-19:

- i) Assessments of risks and capacities to determine priorities for emergency preparedness.
- ii) Enhancement of capacities at POE particularly effective screening protocols.
- iii) Surveillance and early warning, information management. • Access to diagnostic services during emergencies.
- iv) Basic, safe health and emergency services.
- v) Risk communications.
- vi) Research development and evaluations to inform and accelerate emergency preparedness.

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NEXUS BETWEEN CLIMATE CHANGE AND HUMAN SECURITY: IMPLICATIONS FOR PAKISTAN

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Abstract

Pakistan is facing one of the most critical issue that is Climate Change (CC). To justify this assumption, the study explains the link between climate change and human security. In most of this climate change and national security connection work, many scholars have put efforts to connect climate change with the non-traditional security. The study first explains the concepts of CC, human and national security and then explains the nexus between the two. Further, the CC cause serious threats to human and national security of Pakistan like increase in temperature, precipitation, rising sea levels, melting of glaciers and other environmental conflicts which leads to the conflict and instability at the domestic and national level which has negative implications on the security of the state. This paper comes with the policy recommendations at the national level for Pakistan to reduce the impact of CC on the security of the country. To ensure the human security, the study concludes that to cope with the challenges of climate change is the need of the hour.

Keywords: Climate Change (CC), Human Security, Pakistan, Conflict, United Nations General Assembly (UNGA), Intergovernmental Panel on Climate Change (IPCC)

Introduction

Over the last few years, the phenomenon of CC has turned into a very serious challenge, which was mainly an environmental issue before. It is currently the most debatable challenge for the security and the development of the whole world. At present, if climate change could not be controlled effectively, it can have severe consequences for the national security settings of the state.

CC is a critical issue for South Asia specifically for the national and human security of Pakistan. There are various challenges which Pakistan is facing related to national security as well as sovereignty and further increase in climate change is making the situation worse. If a state is weak and the society is unable to face the climate issues, it results in environmental conflict which has negative implications for the human security which in turn leads to insecurity on national as well as international level. The sensitivity level of CC can be seen from the issues related to food insecurity, floods, droughts, scarcity of water resources which greatly affects the agricultural and economic sector and has direct impact on the human security of Pakistan. It is a very serious national security threat to the country but there are limited policies and research work on this serious matter.

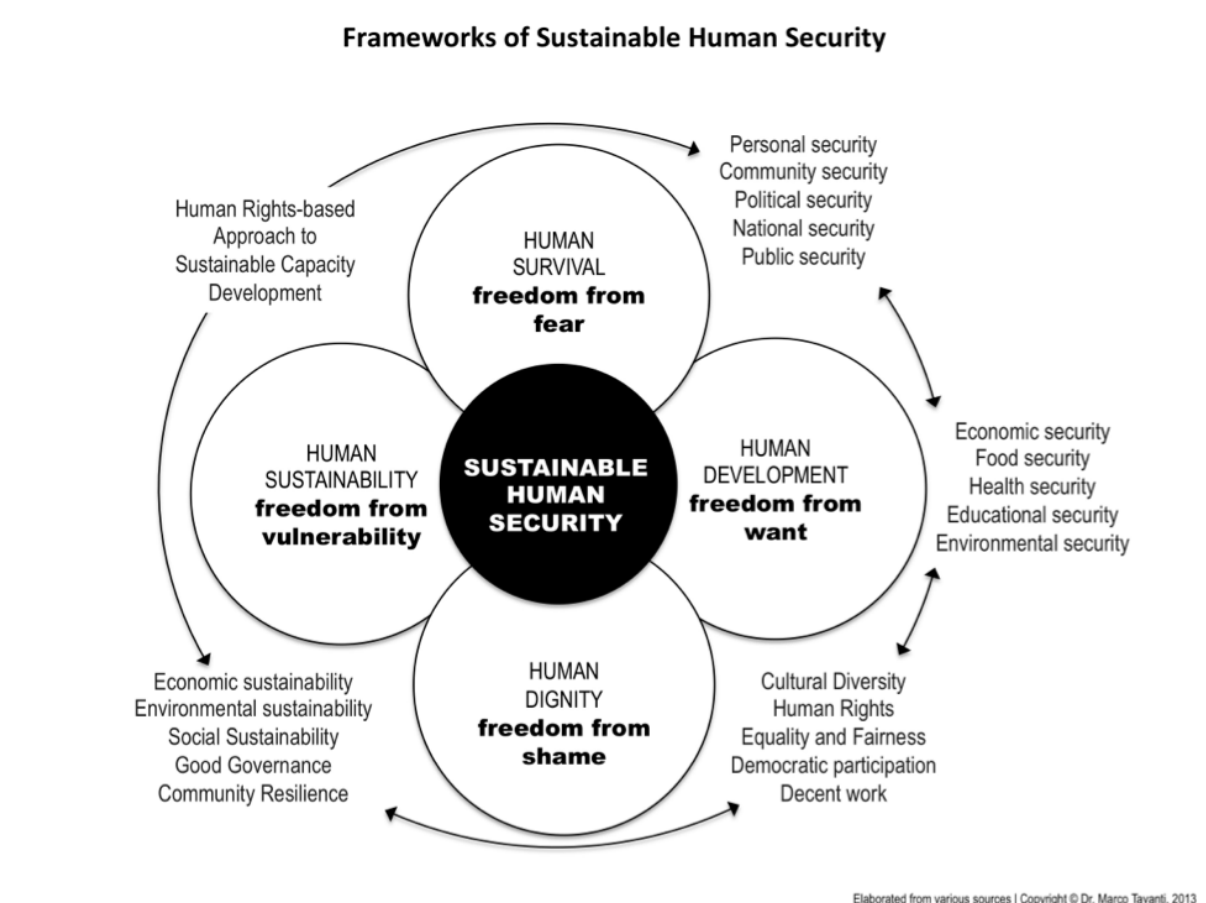
However, there is a continuous struggle in finding the connection between CC and national security. CC is seen as a “threat multiplier” which is capable of creating political instability and violence. “Climate change could create risk of major disruptions to economic and social activity, on a scale similar to those associated with great wars and economic depression of the first half of the twentieth century.” (N, 2007). This could easily disrupt the social unrest, tensions and conflicts in the society.

In this paper, the whole focus is on a serious issue which is climate change and how it links with human security, which is directly connected to national security. It would try to find out the link between CC and national security, would also try to discuss whether CC is a threat to human security and draw inferences on how CC is challenging the human security of the country. The question arises whether CC is a threat to national security and increase in the changing climate leads to threat to the non-traditional security (Tariq Waseem Ghazi, 2016) and put light on the human security aspect.

This paper first discusses the relationship between CC, human security and national security to find out whether this relation exists or not. Then, it discusses the implications of climate change particularly in Pakistan. This section highlights the major issues due to climate change specifically in Pakistan and how they impact on the human and national security. Then, in the next section it highlights the policy framework for dealing with the CC and human insecurity nexus. The paper concludes that it is the need of the hour to stand up against the menace of CC and the effects caused due to it to ensure the human security in Pakistan.

Climate Change and Human Security Nexus

Before understanding the nexus between CC and human security, we firstly have to know what these terms actually mean, then we would be able to further understand the relation between the two. CC can be best defined as “significant changes in global temperature, precipitation, wind patterns and other measures of climate that occur over several decades or longer.” (Science & Climate Change, 2019). According to General Assembly resolution 66/290, the human security can be defined as “people-centered, comprehensive, context-specific and prevention-oriented responses that strengthen the protection and empowerment of all people.” Human security can best be understood through the diagram given below:



Source: (The International Journal of Sustainable Human Security)

There has been a constant argumentation about the different perspectives on whether the climate change should be viewed as a serious challenge to national security or not. At present, a various report, proceedings, articles and steps are taken which proves that CC is no doubt a concern whether it is of human or national security. The relation between CC and human security is an old discourse, it is evident from a conference in Toronto, Canada in June 1988, “The Changing Atmosphere: Implications for Global Security”, which pointed out the major threats on the international security caused due to climate change (Usher, 1989).

Former UN Secretary General Kofi Annan defined “environmental disasters” like increasing droughts and intensity of storms as “one of the threats to human security” (Annan, 2000). In the Fourth Assessment Report of IPCC, the UN General Assembly (UNGA) had a debate on “Climate Change as a Global Challenge”. The conference focused “to intensify the UN agencies efforts in considering and addressing climate change, including its possible security implications.” (“Climate Change: the Science, the Impact and the Adaptation Imperatives & Mitigation Strategies in the context of sustainable development”, UN, 2007)

A report was also submitted on “climate change and its possible security implications”, which mainly focused on the relation between CC and national security. The report highlighted five threat multipliers posing threat to security due to climate change, which are: One, heavy floods and droughts badly decrease the agricultural yield and greatly affect the health of the people, which result in human insecurity. Second, climate change reduces the socio-economic growth of the country which results in ineffectiveness and poor management of the state. This leads to internal instability in the state resulting in worsening situation of law and order. Third, the displacement of population, inward migration and internal competition of resources due to CC can result in the internal conflicts which would lead to insecurity and violence. Four, rising sea levels become a bigger challenge for islands or small lands as they will lose their land due to floods. This threatens the security and sovereignty of the state. Five, climate change brings the trans-boundary conflicts between states on water and other resources, for example the conflicts between India and Pakistan over water.

In response to these threat multipliers, there are also some threat minimizers which could mitigate the effects of climate change. These are: mitigation and adaptation, development in the economy, strong democracy, good governance, strong institutions, mutual cooperation,

proper time prediction and a need to increase the support for development in research programs on further understanding the relationship between CC and human security.

The UN Security Council has dedicated two sessions to the security threat posed by climate change. A recently published US Department of Defense Adaptation Roadmap states that “climate change poses an immediate threat to national security,” calling on the military to incorporate climate change into “broader strategic thinking about high-risk regions” (human security and climate change, 2016). The UN Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol contain no reference to human security (human security and climate change, 2016).

Rattan Lal in “Climate Change and Food Security in South Asia” discusses that CC is a major challenge in South Asia due to its impacts on increasing temperatures, precipitation levels, rising sea levels, melting glaciers and the degradation of natural resources (Lal, 2011). According to the Fifth Assessment Report of the IPCC (2013-14), migration due to climate change, resource competition and severe weather conditions result in increasing poverty and economic instability which gives power to violence and conflict both at the domestic and national level. Throughout the twenty-first century, the impacts of CC are considered to further reduce the economic development, more difficult to reduce the poverty, make the food insecurity more complex and increase the risk of human insecurity.

In his book, “Six Degrees: Our Future on a Hotter Planet”, Mark Lynas argued that “any crisis in food production could quickly escalate into a crisis for the whole Pakistan economy. Farmers across the country may find themselves outmatched in turn by big cities like Lahore, Hyderabad and Karachi, which each support populations in the millions” (Lynas, 2008). The scholars who have made efforts to find the ways to connect the climate change and the non-traditional security are Homer-Dixon and Myres. According to them, there are generally two assumptions: First, due to CC, instability can lead to social and political unrest and could result in “civil turmoil and outright violence” (Myres, 1989). Second, climate change could lead to internal as well as external insecurities. Increase in the patterns of extreme weather events due to CC would lead to economic and political instability which threatens the security. Therefore, it is obvious that the nexus between CC and human security has both implications on whole globe as well as South Asia particularly Pakistan.

Implications of Climate Change in Pakistan

Pakistan is facing serious consequences due to CC. Pakistan is very high on a vulnerability scale (Syed, 2016) and recent events have shown that Pakistan is vulnerable to all of these threats including frequent floods, killer heat waves in Karachi, earthquakes and freak tornado in Peshawar have shown that CC is the most serious threat to the human security of Pakistan. In 2015, severe heat wave killed nearly 1,500 people in Karachi, killed 49 people and great loss of property and lives in Peshawar due to severe tornado. CC affects the health sector in a negative way and is injurious in spreading the Dengue virus. In addition, due to an increase in global warming and rapid melting of glaciers, Pakistan has faced years of floods that have hit the rural economy drastically. Changes in weather patterns and frequent floods affect the productivity of the agricultural sector, have a negative impact on crops, heavy losses on the economy of the state and have a significant impact on the situation of food security. The situation regarding food security and agriculture has already been worse and climate change is making the situation harder.

Pakistan's climate change vulnerability and costs are real and rising. There are numerous factors that have made Pakistan a vulnerable state to climate change, such as geographic location, growing population, economic instability, unstable infrastructure, and bad governance. So it can't afford to take the matter for granted. The steps taken by the previous government on CC such as the Task Force and the Climate Change Core Committee have been considered effective in addressing the issue, but these steps are unfortunately inactive now. The current government is working on the National Climate Change Policy and its Frameworks, the Ministry of Climate Change is also taking the mitigating measures to help in reducing the emission of greenhouse gases.

Climate change is a constant process and a 'threat multiplier' for the national security of Pakistan as it has a very high risk and vulnerability to CC (Qurat-ul-Ain, 2017). Visible changes in the climate of Pakistan have been observed in recent years:

- Patterns of precipitation
- Droughts
- Periods of water availability
- Heat wave frequency and intensity
- Increased variability of monsoons
- Deforestation
- Natural disasters caused by weather – melting of glaciers, floods, etc.

Precipitation has increased by an average of 25 percent over Pakistan. Future annual precipitation, however, does not expect any significant change. CC increases the monsoon rain variability resulting in higher number and intensity of droughts and floods. There is a very little contribution to the greenhouse gases emissions in Pakistan but is considered one of the most vulnerable countries ("Environment and Climate Change Outlook", 2016).

Implications for Pakistan

Food Security

In the next three to four decades, the Himalayan and Karakorum glaciers will melt away, increasing in the flow of Indus River System ("Climate Change Mitigation and Adaptation Considerations For Hydropower Projects In The Indus Basin", 2016). It will then threaten the food and human security and will have a great impact on 95% of irrigatable land. Due to the massive heat wave and flooding, the crops are being destroyed and people are unable to find food in the far remote areas of Sindh and Punjab.

Public Health

Climate change induces extreme temperatures and events of rainfall can result in increasing diarrhea incidents and numerous viral diseases. Dengue fever has started to go viral in Karachi and Rawalpindi as a result of wastage and dirty water. There have been a total of 1,225 cases in the Sindh province in 2019 out of which 1,164 cases just in Karachi, which is a very alarming situation (News, 2019). Punjab has been fighting it well since then, while the situation in two other provinces is worrying. A substantial increase in diseases would result in heavy losses to bear.

Water Security

Pakistan's freshwater resources are extremely short and becoming a water stress country, leading towards water availability of less than 1000 cubic meters per year by 2035, as predicted in a World Bank Report. Pakistan's primary water sources are monsoons, western winds and inflows in the rivers from the Hindukush-Karakoram-Himalayas into the Indus River System due to melting of snow and glaciers. By 2030, agricultural production would be greatly affected due to water scarcity resulting in food insecurity and threatening the conflicts across borders. The government of Pakistan at first tried to make new dams for storage of water but all in vein.

Coastal Flooding

Due to rise in the sea levels, large-scale coastal flooding and recession of flat sandy beaches, salt water in the Indus Delta and mangrove risk, coral reefs and fish breeding grounds are expected. Due to increased tropical cyclone intensity, high risk to Karachi and other coastal areas of the Sindh-Makran coast, there is an increased risk to life and property in coastal areas. (Impact Forecasting , “Pakistan Flood Event Recap Report”, 2010).

Rising Sea Levels

There are the evidences of rise in sea level along the coast of Pakistan that would have the following consequences: (Annual report, “Environment and Climate Change Outlook”, 2016).

- Coastal region erosion
- Coastal flooding
- Delta flooding
- Aquifer and soil salinization
- Loss of habitat for animals, birds and plants

The instability in the effects of floods, rainfall, droughts and severe weather conditions may overcome a government or state's capacity for disaster-response / management. In recent decades, Pakistan has witnessed many floods and droughts. Due to poor mechanism and lack of political will to counter these problems, environmental problems in Pakistan are severe. In addition, the misuse of natural resources has made vulnerable changes in the environment of the country. Pakistan is prone to CC in monsoons, temperature changes and cyclones resulting in negative impacts such as devastating floods, droughts and rise in sea levels.

The changing global climate patterns have adverse effects on Pakistan such as water shortages, low agricultural yields, undermining the livestock, spreading epidemics and endangering the coastal areas which results in the increase of population migration. “The impact of rise in temperature would lead to a loss of one-fifth of the country's existing glaciers by 2030” (Markey, Climate Change and National Security: A Country Level Study, 2011). This huge and rapid decline in glaciers is expected to turn regional rivers into seasonal rivers. He draws attention to the increasing effects of CC in the form of water scarcity, damage caused due to coastal flooding and various other impacts.

By 2050, crop yields in South Asia are projected to be reduced by up to 30% and the availability of fresh water will be reduced by 12-20% due to climate change. Recently observed climatic variations such as increase in temperature, increase in monsoon and decrease in humidity,

indicate irregular weather pattern shifts. Similar changes in frequency and intensity are expected to increase, leading to severe weather issues such as floods, drought, and glacial recession. Dr. Qamar uz Zaman Chaudhry, author of the Pakistan National Climate Change Policy Project, points out that “rising extreme weather events in Pakistan over the past two decades, such as floods and droughts, are adverse effects and indications of climate change.”

Food and Water Insecurity

The economy of Pakistan is directly dependent on agriculture which includes 25% of its GDP, 2/3% of its employment, 80% of its exports and consumes a large proportion of water resources. Water shortage will further worsen the energy and food availability. With 240mm of annual rainfall and only 24% of arable land, overpopulated Pakistan would mostly become arid without its precariously dependent Indus water irrigation system.

Limited availability of water will lead to food and energy insecurity in Pakistan. Water shortages will undermine the Indus River System which is the backbone of the irrigation system of Pakistan, having the impact on crop yields and revenues such as wheat, cotton, and sugar (Raza, 2009). Decreased water availability will affect rice production and rise in temperature will decrease the duration of seasonal wheat growing making arid and semi-arid areas 90 percent less favorable for growth. It also emphasizes the insecurity of dismal energy in the presence of 162,000 megawatts of acute demand by 2030. Demonstrations due to food, blocking of roads, damaging the public property due to food shortage and rising prices and energy shortage prices have become the features of the so called policies in Pakistan.

Migration becomes a threat when the indigenous anticipate with new settlements a shortage of resources. Similarly, earlier inter-state migrations in the region have erupted into war due to the impact of politics and economics. India justifies the war with Pakistan in 1971 due to the massive influx of East Pakistan refugees. In summary, insecurity related to water results in the insecurity of food and energy and other challenges regarding environment like droughts and devastating floods can result in harsh conditions for livelihood and internal migration.

The major factor for the domestic and regional conflicts in South Asia is water sharing. It is an unresolved and disputed issue for Pakistan, India and Bangladesh in the region. Sharing of water is one of the most critical factor in the Kashmir issue because of the important water resources in Kashmir which pose serious implications for the agriculture of Pakistan. These countries have fears for each other about the system of water. Pakistan has strong reservations

about the Tulbal navigation project of India that is Wullar Barrage, Kishenganga Dam and Baglihar Dam of Pakistan (Swain, 2004).

India also objected to the Diamer-Bhasha dam in Pakistan. Water sharing is not only the issue between states but also the issue within the states like between Punjab and Sindh of Pakistan and Punjab, Haryana and Rajasthan of India. Punjab is considered as the main province with major water resources in Pakistan which hinders all the efforts required for making the large dams important to store water and fulfilling the demands related to energy. CC affects the availability of water for future which can turn into conflict and a war between states or internal conflicts between the provinces and political instability particularly in the absence of a democratic government.

Policy Recommendations at the National Level

National Level

Four major areas are need to be worked on to achieve effective adaptation, mitigation and disaster management. It is a priority to raise awareness, organizational and institutional adjustments, build capacity, and develop infrastructure.

1. Awareness

To put light on the threats related to CC and its implications, immediate action is required to raise awareness through targeted media and advertising campaigns. Local communities can be trained and mobilized to adequately prepare for disasters. It would require local government and NGOs to cooperate in raising awareness, especially among farming communities and in poor urban areas. The government has taken awareness steps by launching campaigns like Clean and Green Pakistan, Plastic Free Pakistan and 10 Billion Tree Tsunami Program. These should be implemented by each one of us.

2. Organizational and Institutional Initiatives

By strengthening the Climate Change Division and making it more efficient and accountable, organizational and institutional initiatives at the national level can be undertaken in the short term. This will also help the Division to decentralize, giving it greater freedom to fulfill assigned tasks.

3. Capacity Building

Climate change related institutions need to address human resource requirements for numerical modeling and fundamentals of the climate system. Government should

ensure that universities offer courses on climate system patterns and relevant sciences at graduate and post graduate level. In addition, it is necessary to improve the irrigation system by introducing large amount of sprinkler and drip irrigation. This requires adequate funding. The use of modern and more efficient irrigation systems must therefore be encouraged by government policies.

4. Infrastructural Development

Diamer-Bhasha, Akhori, Munda and Kalabagh dams are essential for floods, droughts and sea intrusion mitigation at the federal level as we have much less capacity in our country. These dams will provide regulated flow through the Indus deltaic area to overcome sea intrusion and help in preserving the ecology and saving local people's livelihoods. To ensure effective implementation, provincial and local governments need to be mobilized. Provincial and district rain water harvesting is needed to counter water scarcity and sub-surface water charging. Government should encourage the use of solar energy by households and small businesses and integrate excess generation with the national grid.

Conclusion

To sum up, it becomes obvious from the facts and figures that climate change imposes great and negative implications on the human security in Pakistan which directly impacts the national security of the state. Some policies and steps have been taken to reduce the impacts of CC but they are not the final solutions to that. The government must take solid policy measures to ensure the security and sovereignty of the state. It is the dire need of the hour to control the menace of climate change which has threatened the human security and lives of the people of Pakistan.

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Pakistan-China Military and Security Ties

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Abstract

After China's emergence as a global power, military modernization, strengthening military ties with other states in different regions of the world, and enhancement in arms exports are some of China's objectives to achieve. This research paper focuses on analyzing China and Pakistan's cooperation in defense sector as it is one of the leading elements of Pakistan-China strategic relations. This paper analyzes the Pakistan-China defense cooperation in all three branches (Army, Air Force, and Navy). This research study has employed the qualitative method in which secondary sources of data have taken from existing literature, published and unpublished research works and primary data was collected by conducting interviews of International Relations experts' to analyze China's defence and security cooperation with Pakistan. The outcome of discussion reflects that in the post 9/11 period, Pakistan and China have strengthened their military and security ties.

Key Words: China-Pakistan Strategic Partnership, China, Defence, Pakistan, Security

Introduction

In the 21st century, Pakistan-China bilateral partnership has risen to the highest level, and they consider themselves as “All-weather strategic partners.” The Chinese government has consolidated its defense ties with Pakistan by developing multidimensional military technology, development of Gwadar port, joint military and naval exercises, the joint production of fighter jets, and cooperation in the nuclear sphere.

In the year of 2014, China exported military weapons worth \$394 million to Pakistan. In the very next year, this export was increased by 70 percent, and China supplied arms to Pakistan worth \$565 million. It is noteworthy that the US decreased its arms sale to Pakistan from \$189 million in 2014 to \$66 million in 2015 (Tribune, 2016). In its study on the world arms trade from 2011 to 2015, According to Stockholm International Peace Research Institute (SIPRI), in the period of 2013-2017, Pakistan is the largest buyer of these arms with 35 percent of China’s arms exports among 48 recipient countries. (Pubby, 2019). Pakistan has been the biggest importer of Chinese arms sales for all five-year periods since 1991 (pieter d. wezeman, March 2018). Chinese troops Special Service Group visited Pakistan in December 2018 to participate in sixth joint exercise which is an important element of China-Pakistan defense and military cooperation (Pubby, 2019) Sino Pak defense and security ties are enduring and highly thriving. This strong partnership is exceptional and strategic interdependence between the two countries and convergence of interests have further given a boost to this existing relationship that has developed over the last sixty years. Along with many significant factors that have been discussed in the earlier part of the chapter, initially the India-Pakistan’s 65 and 71 wars and China’s border conflict with India in 1962 laid the foundation for China-Pakistan security relations. Many Chinese scholars used the term “common strategy” Pakistan-China strategic relations especially after 1965 and 1971 wars, but particularly in the latter half of 1970s. The Soviet Union invasion in Afghanistan made Pakistan-China strategic relations stronger. (Singh & Sciences, 2007).

After 9/11, due to various developments and emergence of new threats, China and Pakistan are consolidating their collaboration in regional and national security matters. China has assured Pakistan that it will continue to support Pakistan in every possible manner. There are frequent political and military high level visits from both countries in past few years. Qamar Javed Bajwa

visited China in 2018 after his appointment as Chief of army staff of Pakistan where he met with Chinese military and political officials. He discussed regional security, economy, defense and other agendas of common interests. After the meeting, Chinese media reported that China has plans to strengthen military ties with Pakistan by developing ballistic missiles, cruise and multi-role combat crafts. According to a Chinese military expert Song Zhongping, “China’s authorization to Pakistan to produce ballistic missiles, cruise missiles, anti-aircraft missiles, anti-ship missiles and main battle tanks in Pakistan is on the agenda.” (T. E. Times, 2018)

The most significant visit was made by Prime Minister Imran Khan in November 2018 when both countries pledged to strengthen their defense and security ties. In this visit, China and Pakistan agreed to enhance military cooperation between two countries and continue their joint efforts to counter terrorism, extremism and separatism. Both sides believe that these joint efforts are required for stable security environment. According to security analysts, Pakistan is replacing its western suppliers with China as its main defense supplier due to China’s low prices and loose financial terms because Pakistan is a cost conscious customer because of its economic challenges (F. Times, 2016).

In a personal interview, Brigadier (Retired) Naeem Saalik and Salma Malik agreed on this point that China is the only country who is willing to transfer the technology to Pakistan in recent times at cost effective price as Pakistan is facing resistance for getting F-16 fighter planes from US while other options require hard cash. So buying from China is cost effective for the country like Pakistan who is facing security and economic challenges. Brig. (Retired) Naeem Saalik said: “One important factor is that this inequitable system based on political considerations in which some countries are given access to advance technologies where as countries like Pakistan are denied access to advance technology .We have seen in the past that when United States congress completed rejected to finance the deal of giving eight F16 to Pakistan which Pakistan is still trying to get, so if you have to buy cutting edge technologies from other sources, that one is very costly ,for instance if you get it from France, they will ask for hard cash which Pakistan Does not have, US had political strings attached to this deal as they forced Pakistan to act against Haqqani Network and Pakistan rejected those conditions So, China is now the major provider of the defense equipment to Pakistan , China is exporting to other countries as well but Pakistan is the largest client. China is one country that this is a reliable source of supply and is the only country who is willing to transfer all the technology to Pakistan as we have seen in the case of joint development JF17 Thunder, we have

seen this cooperation in terms of tanks, missiles, so they are willing to transfer sophisticated technology, Pakistan and China have entered into submarine deal some of those will be manufactured and assembled in Karachi. Chinese technology is still affordable for the country like Pakistan and they are also willing to provide loans on soft terms. We need to enhance our capabilities because India is getting sophisticated and up to date technology from all major arms exporters”(Saalik, Personal Communication November 12, 2018).

As there are serious security threats to Pakistan from Afghanistan and Indian fronts so it needs to enhance its defense capabilities. Initially America was the main arms provider to Pakistan but with the ups and down in this relationship, Pakistan understood this point that it needs to diversity its relations for its defense needs and China became a continuous source of support for Pakistan. As India is getting defense support from all the major powers and Pakistan is denied to all the new and sophisticated technologies, China is the only country which is ready to enhance Pakistan's defense capabilities and it is cost effective too as Pakistan is unable to afford expensive arms due to its economic crisis.

Salma Malik has mentioned the same reasons for Pakistan's reliance on China. She said, “For Pakistan the access to Chinese technology or cost effective Chinese technology, I would not call cheaper because that gives a different message, cost effective technology has been very beneficial because of Pakistan's limited purchase capacity. The second aspect is that the China and Pakistan are geographically very close to each other so having assembly lines, collaborations and the proximity also helps in a certain passion. It is also need base thing that China is willing to relax a lot of things when it comes to defense collaboration. And that is something which is always beneficial for a country like Pakistan as it was struggling to attain good technology at a cost effective price and that is something that China has done to Pakistan”.(Malik, Personal Communication November 19, 2018) China has as always and traditionally provided Pakistan with intermediate range weaponry, small weapons and light arms, helped in establishing the Heavy Industries Taxila (HIT), the KAMRA heavier aeronautic complex and so many other things speak for itself plus the fact that the type of purchases Pakistan had made in the past when they required refurbishing, going to the western countries and getting extremely expensive spare parts, all was very difficult for cash a challenged Pakistan. So for Pakistan, having great cooperation with China in defense sector is a great source of strength and China got very strong consistent customer in form of Pakistan so that is something which really works for them.

U.S was the biggest seller of defence supplies to Pakistan but current equation between US and Pakistan has been changed. U.S has accused Pakistan repeatedly for harbouring militant groups like Haqqani Network and Afghan Taliban. US suspended coalition support fund and military training programs for Pakistani military officials despite of fighting a war for Americans at a very high cost of military personals, civilian lives and it has also affected the economy.

Dr Muhammad Khan expressed his views regarding US's allegations on Pakistan and suspending support fund as: "It is a tactic that US is using to pressurize Pakistan to do more. As Pakistan said that it is no more dependent on US and relationship should be based on equality and mutual interests. Pakistan is fighting against the terrorism and US is still accusing Pakistan that they are providing safe heavens to the terrorists and it is a known fact that Pakistan has provided evidence to US and UN and India that Afghanistan soil has been used against Pakistan and Pakistan is fighting against these non state actors by launching military operations Zarb-e- Azab and Radd-ul-Fasaad. Pakistan has told the international community that terrorists are terrorists. Pakistan has no favorites. Haqqani has been killed in Afghanistan and their network is operating from Afghanistan. Whatever USA has given us it is because we were fighting on their behalf. But if we look at China, China is also supporting us because of its own interests. National Interests come first. China is not doing anything extra. They have their stake in Pakistan and if we take a look at history, Pak did more extra for China than China did for Pakistan."(D. M. Khan, Personal Communication October 23, 2018). The US suspension of coalition funds and training programs for Pakistan is not the first time. They have used this tactic several times in the past to pressurize Pakistan to act accordingly to their desires. The current situation is quite different from the past as Pakistan has learnt from its past mistakes and now it relies more on China for its economic and defense needs than US. Pakistan has made it very clear under the new government that the relationship between US and Pakistan will be based on mutual interests and respect. China has its own interests as well as every state has its own interests when it comes to partnerships and relationship in international politics. If we analyze the whole situation, Pakistan is more significant for China than China for Pakistan due to China's regional and global agendas which it needs to achieve.

In a personal interview with former Ambassador of Pakistan to United Nations and Executive Director of Centre for International Strategic Studies, Ali Sarwar Naqvi argue that growing mistrust in Pakistan-US relations is also one of the factor that is pushing Pakistan more towards

China for defence supplies. Riffat Hussain and Imtiaz Gul expressed similar views. Ali Sarwar Naqvi said: “Since the US was the bigger defense supplier to Pakistan and as Pakistan fully understand now that Pakistan cannot fully depend on US anymore because there have been some sanctions by the US and there have been interruptions, there are certain suspensions on their programs , so in that scenario yes Pakistan does turn towards china more than it used to before.”(Naqvi, Personal Communication November 14, 2018)

Dr Riffat Hussain argued: “The two developments that I had in mind among others are first of all there is mark deterioration in U.S. Pak ties. And that’s quite evident from Trump’s South Asian strategy in which they have singled out Pakistan as the main hurdle in America’s desire to pull back from Afghanistan. In fact they have accused Pakistan of promoting terrorism and the second indication of that is American action for example they have suspended coalition support fund to Pakistan and secondly they have decided not to provide any further defense assistance to Pakistan so this aid cut off to Pakistan along with the American closing up to India is a clear indication to Pakistan that U.S is no longer available to Pakistan as a strategic partner to them which to Americans used to be ever since the period of cold war. As a result of these two developments the Pakistanis have decided to firmly move to consolidate their security relationship with China.”(Husain, Personal Communication November 6, 2018)

In the view of Imtiaz Gul; “Pakistan has moved away from US and Pakistan has embraced china as a strategic partner based on the lessons of past seventeen year because all Pakistan has got in last seventeen years putting after the unfolding of war on terror is condemnation, criticism and this blame of double game etc so gradually Pakistan has realized that looking up to the United States wouldn’t helped particularly because after the 2006,2007 nuclear cooperation deal between India and united states so I think Pakistan has been consciously chosen to tilt towards china for not only for security but also for strategic framework.”(Gul, Personal Communication October 29, 2018)

In a personal interview with Ghulam Ali, Farhan Siddiqi, Manzoor Afridi, Brig. (Retired) Naeem Saalik and Salma Malik, they all mentioned the same point that initially Pakistani military was getting American technology while the present rift between US and Pakistan forced Pakistan to look for other options not only toward China but also Russia. Ghulam Ali said, “Yes Pakistan’s current equation with US has forced Pakistan to look towards China more because we are dependent economically and militarily on foreign sources since our independence so when

Pakistan's resources are cut down by one source it certainly pushes Pakistan more towards China.” (D. G. Ali, Personal Communication January 12, 2019)

In the view of Farhan Siddiqi, “The more of Pakistan's relationship with United States of America is based on friction which is one of the reasons that push Pakistan towards China more”. (Siddiqi, Personal Communication December 27, 2018) According to Manzoor Afridi, “Recent US policies towards Pakistan are the repetition of its policies, when John Kennedy came in 1961 and cut the military assistance, then Pakistan became closer to China. Pakistan and China signed big agreements for which USA was not happy then. And even after that in 1965 war with India, USA imposed economic and military sanctions on Pakistan. So that's why Pak got much closer to China. In recent times, same thing has repeated as Trump administration has suspended coalition support fund and military trainings so without any doubt Pak gets closer to China in getting any military assistance, military training and military hardware and one more imp thing is that Pakistan is also getting closer to Russia. And the Russian troops have come to Pakistan for joint military exercises. So Pakistan is not only getting closer to China but also looking for further options like Russia.” (Afridi, Personal Communication October 24, 2018) Brig. (Retired) Naeem Saalik said, “It is very obvious because when one runs out of choices then whatever the option is available to you, you go for that that is why Pakistan along with China, is trying to open up to the Russians.” (Saalik, Personal Communication November 12, 2018)

According to Dr Salma, “Pakistan has very strong and solid defense needs because of the extremism and rise in terrorism especially in post 9/11 era, and whatever was provided by US, it was because Pakistan was fighting its war at the very high cost and US now is no longer there as a party with Pakistan side rather it is adding to the tensions in the region and this is making the case between Pakistan and China stronger than it was ever before.” (Malik, Personal Communication November 19, 2018). According to Former foreign Secretary Riaz Muhammad Khan, Pakistan's defense relations with China do not affect by Pakistan's equation with America as they are always remain steady. China–Pakistan military cooperation is steady and remains unaffected by other factors including ups and down in our relations with the US. America suspended our reimbursements under Coalition Support Fund (CSF) for our deployment of forces in US led war on terror which was an agreement between the two sides in 2002. The suspension could affect somewhat Pakistan's capacity to fight terrorism and extremism which in any event Pakistan needs to continue in its own interest. In fact CSF was a bad arrangement from Pakistan's

point of view. While we agreed to get reimbursements for our deployment, Pakistan allowed free of charge the use of ALOCs and GLOCs (Air Logistics Communications and Ground Logistics Communications) as well as the use of three air bases. As far as suspension of training is concerned, this is a controversial step even within the US establishment, because many American officials believe that the arrangement generated goodwill among personnel of the two militaries and that a similar suspension earlier in the 1990s was harmful from the US point of view.”(R. M. Khan, Personal Communication January 16, 2019)

Most of the scholars in Pakistan believe that the money Pakistan was getting from America was not enough and Pakistan has spent a lot more than these reimbursements and have given more support to American and NATO forces than any other country. Pakistan’s relations with US do not affect Pakistan-China strategic partnership due to China’s consistent policies towards has Pakistan.

Aizaz Ahmad Chaudhry said: “In military aspects China is Pakistan’s largest supplier of defense equipment. Pakistani military services (army, navy and air force) train closely with Chinese military forces. Pakistan’s military relationship with China was already close, by the time U.S. cut military aids, suspended training programs and denied f16 supplies in recent years.”(Chaudhry, Personal Communication December 3, 2018) Initially, Pakistan and China came closer because both countries wanted to counter India’s hegemony in the region because of their territorial conflicts with India. Some scholars called Pakistan-China relations an Indian Centric relationship. Later on and especially in post 9/11 era, new dimensions have been added to this bilateral cooperation due to the changing scenarios and most importantly due to rise in terrorism and extremism in the region. China’s strong defense cooperation with Pakistan serves China’s interests in South Asia which include peaceful security environment in Pakistan and Afghanistan, curtail the influence of militants and separatists, securing energy and trade routes.

According to Manzoor Afridi, China’s defense cooperation with Pakistan is not just because of the fact that China wants to make Pakistan stronger but also it serves China’s own strategic interests in South Asia (Afridi, Personal Communication October 24, 2018). There are number of objectives which China wants to achieve and Pakistan is a reliable partner to achieve its goals. Firstly, China is directly threatened by Uighur separatists in its western province Xinjiang and strongly feels that these Uighur Muslims have direct links the militants who are operating from Pakistan and Afghanistan’s soil. So China feels that Pakistan can curtail terrorism. Pakistan has made an every

possibly effort to avert the use of Pakistan's soil against China in any manner. Many religious organizations which alleged to have connections with militants in Xinjiang (western part of China) were banned by the Pakistani government. Pakistan also caught many Uighur separatists and they were given to China. All the political parties in Pakistan were agreed over the issue of not to support any terrorist group in China. To fight against terrorism, Pakistani armed forces entered in tribal areas of Pakistan to destroy militants' hideouts and these efforts were acknowledged by Chinese government at various International platforms. Secondly, instability in Pakistan and Afghanistan poses serious threats to China's grand economic and strategic ambitions. In the past several years, many agreements for various development projects were signed by both countries but security issues within Pakistan were not satisfactory for the Chinese workers so the progress on these projects remained slow. Pakistan's law enforcement forces have made a lot of efforts to make internal security situation better so the working environment could be peaceful and secure foreign workers and investors. Thirdly, if there would be a peaceful and secure environment in this region, China's strategic interests would be served. China's main focus is to enhance cooperation among regional states to fight against nontraditional security threats. In 2004, China mediated India-Pakistan peace talks because it knew that cooperation among regional states is must in a struggle against emerging non-traditional security threats and this could not be possible until India and Pakistan would not cooperate to resolve their bilateral issues. Therefore, to formulate a strong and joint comprehensive strategy to fight against non-traditional security threats has also given a new direction to Pakistan-China's existing security cooperation.

During Cold war, both countries established their defense ties and since then, China is the most reliable defense partner of Pakistan. From 1960 to 1980, Pakistan got one third of its arms supplies from China. This was more than what US and other countries supplies to Pakistan. China continued exporting arms to Pakistan even in the post cold war era when arms transfers were in decline. Until mid-2010, according to a defense source, Pakistan received almost 70 percent of its military aircrafts and battle tanks which includes 36 ballistic missiles (1992), 1600 Main Battle Tanks (MBT), 400 fighter aircrafts and 40 naval ships from China (Defence, 24 August, 2010).

During 1980's and 1990's US and western countries imposed economic and military sanctions on Pakistan and at that time China really helped Pakistan in terms of fulfilling its defense needs by supplying defense supplies, small weapons and technical assistance. (Siddique, 2014) Along with the joint production of JF 17 Thunder, there are number of important projects which include Al

Khalid Tank (Main Battle Tank), K-8 training aircraft, F-22P frigates, naval warships, F-85 Tanks and production assistance for JF 17 (Gady, April 28, 2015). Western countries believed that China has also developed a manufacturing compound for building “turnkey ballistic missile” in Rawalpindi, a city of Pakistan closer to its Capital. In addition, China helped Pakistan by providing assistance in developing Shaheen-I ballistic missile which is a 750KM range missile (Hussain & M Heritiana, 2015). Furthermore, China and Pakistan are committed on new joint projects and work closely to consolidate defense collaboration (Z. A. Khan & Ahmad, 2015).

Defense Cooperation between Ground Forces

Pakistan and China enjoy closer defense ties as this relationship serves interests of both countries. The salient features of Sino-Pak defense cooperation are:

- i. Pakistan always enjoys China’s support in terms of weapons and technology and fulfills its defense needs especially at times when it faced military sanctions from major power (U.S and western countries) during Indo-Pak wars.
- ii. Beijing’s main objective of providing military weapons is not just to make Pakistan more dependent on China, but also to make it stronger and self-reliant. Hence such assistance helped in establishing Pakistan’s own Heavy Industries Taxila for the production of arms and ammunition, spare parts, license production and joint production of fighter aircrafts for enhancing its military capabilities.
- iii. Pakistan’s defense sector was strengthened by China’s continued arms sale and it helped Pakistan in improving its defense posture. China’s continuous support in defense sector instigated other defense suppliers to sell their defense technology to Pakistan.
- iv. There is a trust factor involved in Pakistan-China relations particularly in military terms because it has been very smooth since the beginning. Both countries prefer to keep all the details related to agreements only between the two and reveal the details only when expedient.
- v. As Pakistan does not have domestic, technological, scientific and financial capabilities, defense collaboration with China is more beneficial for Pakistan (Munir, 2018).

Geo- strategic Alliances are one of the important features in global politics and security system; as a result it has made this partnership an important one. China has been a very reliable partner in terms of military as well as political support to Pakistan since 1962. Pakistan's army was supported by China in building arms and ammunition industries, modernizing existing defense facilities and providing technological assistance (Jamal Afridi, July 6, 2010). A border settlement agreement was signed by two countries on 3rd of March, 1963; a great step towards establishing close ties and a first step that was taken by both countries against Indian interests (Akhtar, 2014). With the passage of time, due to mutual interests and objectives, China-Pakistan became reliable partners. For China, Pakistan was a reliable buyer for its low quality weapons, comparatively to western and American technologies. Due to its close partnership with Pakistan, China attained an access to American and Western military weapons and technologies which Pakistan bought from them. For China, Pakistan was also a strong ally against India. In return of all these benefits, China provided Pakistan low cost yet effective and extensive military technologies and support. The first and foremost important step in military cooperation was taken by both countries soon after 1965 India-Pakistan war. Pakistan received support from China against India as China set its own forces on high alert on Indo-China border and threatened India of calamitous consequences (McGarr, 2013). Pakistan and China consolidate their defense in the wake of new developments and security challenges in the region and they are committed to further strengthen defense ties as it serves mutual interests of both countries. The two counterparts conducted a formal meeting at Joint Staff Headquarter Chaklala on June 22, 2011. Both countries emphasized to enhance mutual cooperation in various field of defense, training programs, countering extremism and terrorism, technology transfer, joint military exercises and acquiring military equipment and defense supplies. In this meeting, China and Pakistan signed two important agreements to consolidate the strategic partnership between two countries (Munir, 2018).

Chang Wanquan, the Chinese Defense Minister, visited Pakistan to meet Pakistan's high military and political officials. During his visit, Chang met the Prime Minister Nawaz Sharif, Defense Minister Khawaja Asif, Chief of army staff Gen. Raheel Sharif in February 2014 (Dawn, Februaray 28, 2014). In his meeting, he assured Pakistani officials that China is committed to further strengthen a defense and security relation which is a significant step towards regional peace. In addition to these meetings, defense delegation from both countries arranged a joint session to discuss joint production programs and China assistance to Pakistan in attaining self-sufficiency in

defense production. Different issues related to naval support, joint military exercises and defense cooperation were also discussed. (M. U.-H. Khan, 2014) Both countries are determined to strengthen their strategic cooperation by initiating several joint projects and joint military exercises.

Air Defense Cooperation

China and Pakistan's cooperation in air defense is commendable. Establishment of Pakistan Aeronautical Complex (PAC) for assembling and production of fighter and trainer aircrafts by both countries is remarkable example of great relationship between two countries. Pakistan acquired assistance from China to build PAC for rejuvenation of air planes in Pakistan Air Force fleet which includes Henyang F-6 (now retired), Nanchang A-5, F-7 fighter aircraft, and Shenyang FT-5, FT-6 Jet trainer aircraft (Munir, 2018). For the production of ground-based radar systems, avionics and electronics, Kamra Avionics and Radar Factory (KARF) also present in Pakistan Aeronautical Complex which is the third biggest assembling plant in the world.

For broadening its working capacity, PAC began production of aircrafts by building an industry (Aircraft Manufacturing Factory) in 1980. The Aircraft Manufacturing Factory got appreciation at regional level as it manufactured K-8 advanced trainer aircraft in collaboration with China's Hongdu Aviation Industry Group. China and Pakistan manufactured JF-17 thunder, a combat aircraft at Aircraft Manufacturing Factory jointly ("JF-17 Aircraft,"). The AMF collaborated with China's Chengdu Aircraft Industry (CAI) for JF-17 Thunder production. ("JF-17 Aircraft,")

In the fields of research and development, nuclear weapons and aerospace technologies, Pakistan was assisted by China. Pakistan further acquired assistance from China in various fields such as joint production of combat aircrafts, building aircraft industries, engine designs and production of air jets. Various electronics warfare, radar and unmanned platforms were also supplied by China to Pakistan. China assured Pakistan that it would continue its cooperation. Along with JF-17 Thunder, joint production projects include; Karakoram-8 Trainer and Fighter aircraft, Super-7 Fighter (a substitute for existent F-6 fighter aircraft) and J-10 Fighter. J-10 is the most sophisticated fighter jet owned by Chinese as China gets 70 percent of its arms exports from j-10 sales. Pakistan was the first country with whom China shared this technology by giving 36 J-10 B to Pakistan. Lt. Gen. Waheed Arshad, Pakistan's Army Chief of General Staff, visited China and Chinese officials

promised Pakistan to strengthen defense relations by giving a squadron of J10-B advanced, all-weather, multi-role aircrafts. Pakistan Air force also has Karakoram Eagle which is a Chinese-built Airborne and Warning System. It can identify airborne and sea-surface enemy targets, prior to ground-based radar detection regardless of the height.

Pakistan also acquires assistance from China in space technology. Both countries are strengthening their collaboration in research and Development programs for information gathering from Space (G. Ali, September 09, 2011). Space agency of Pakistan SUPARCO (Space and Upper Atmosphere Research Commission) and China Great Wall Industry signed an agreement for the replacement of PAKSAT-1; Pakistan's communication satellite in October 2008 in Beijing (Dawn, October 30, 2010). Pakistan's Prime Minister Yousaf Raza Gilani visited China in October 2009 and signed an agreement with China regarding satellite's ground control system (Nation, October 11, 2009). In June 2010, an agreement was signed to finance a significant project Framework Loan Agreement according to which, China will provide RMB 86.5 million loan on concessional basis to start work on ground control system (Nation, October 11, 2009). China and Pakistan's defense forces have already corroborated the project. Pakistani and Chinese experts from all three forces (ground, air and Naval) took part in the initial Research and Development phases and the on-ground initiation of the project (Masood, October 10, 2010).

China-Pakistan Naval Cooperation

In September 1971, Muzaffar Hassan, Commander-in-Chief of Pakistan Navy visited China along with his delegation. Both countries began a formal naval cooperation as it was the first and significant visit to China by a Pakistan Naval Chief (Kane, 2016). During his visit, he held significant meetings with Chairman Mao Zedong and Premier Zhou Enlai. At that time, Pakistan was facing internal crisis in East Pakistan. A great security concern regarding situation in Pakistan was expressed by Zhou Enlai. He was in the view that if there would these tensions would increase; it could affect the security of entire region including China. He directed navy commander in chief to provide naval supplies and assistance to Pakistan in this hour of need. Pakistan needed to counter instability and turmoil in East-Pakistan. For this purpose, without any pre conditions over price or payment schedule, China agreed small petrol ships but these ships were delivered to Pakistan after the separation of East Pakistan due to repercussions of 1971 Indo-Pak war.

China and Pakistan started looking for the possibility of arms sale and transfer of technology of F22 frigates in 1985 (Dawn, April 07, 2005). Pakistani government approved an amount of \$700-800 million to purchase four Chinese origin Jiangwei-II frigates ships in 1992 (Defence, August 01, 2009). In addition, Pakistan ratified an agreement with China for acquiring four F-22P frigates (Dawn, April 07, 2005). The detail of China-Pakistan Naval cooperation during 1990-2006 is given hereunder. Both China and Pakistan are determined to enhance this collaboration in developing eight F-22P warships (Munir, 2018) and utilizing the skills of experts from Hudong Zhonghua shipyard (Shanghai) and KSEW. The total cost of building these eight vessels is around US\$ 1.4 billion (Niazi, December 16, 2009).

China is also manufacturing the most advanced naval frigate for Pakistan. It is reported that these advance frigates would be equipped with capabilities such as anti-ship, anti-submarine & air-defense operations. The vessel's class is Type 054AP, which means, it is based on the Type 054A of the People's Liberation Army (PLA) Navy (News, 2019). According to an expert in China's shipbuilding sector, this ship is the largest and strongest combating warship China has ever exported. He stated; "Based on pictures circulating on the internet, the ship will have vertical launch cells that can fire Chinese HQ-16 air-defense missiles and other kinds of missiles. Vertical launch cells will bring flexibility to the user in terms of weapons portfolio, thus giving it a stronger fighting capability." (News, 2019) Once the construction would be completed, the vessel will be one of the biggest and technologically advanced additions to Pakistani Navy fleet and make the capabilities of Navy stronger to take action effectively against future security challenges, maintain regional peace and stability and maintain balance of Power in the Indian Ocean region.

Nuclear Cooperation

China supported Pakistan's nuclear program since the beginning, at the initial stage, it faced equipment and necessary material shortage due to export restrictions from the West. According to few global security experts, China helped Pakistan in acquiring 'Nuclear State' status and presently it is estimated that Pakistan has 110 to 130 nukes in its strategic arsenal (DeYoung, January 31, 2011). For the development of nuclear infrastructure, Pakistan received assistance from China in terms of nuclear facilities and expertise. As a result, Pakistan was successful in establishing its first plutonium producing nuclear reactor at Khushab ("Federation of American Scientists (FAS) A Brief History of Pakistan's Nuclear Program,").

For the amplification of Uranium enrichment facility, China's National Nuclear Corporation provided Pakistan 5.000 ring magnets- a high speed rotational component of centrifuge. China continued its support for Pakistan and provided extensive technical and material assistance for the development of Chashma Nuclear Power Complex and plutonium-reprocessing facility in mid 1990's. ("Federation of American Scientists (FAS) A Brief History of Pakistan's Nuclear Program,") On 15th October, 2008, an agreement was signed for building Chashma-3 and Chashma-4 nuclear power plants (NTI, 2011). For the validation of agreement, on 31st March 2010 the Pakistan Atomic Energy Commission (PAEC) signed an agreement with two Chinese companies; Zhongyuan Engineering Corporation (ZEC) and China National Nuclear Corporation (NTI, 2011) On 30th September 2009, an agreement on fuel supply (NTI, 2011) was signed. Sindh Environmental Protection Agency approved the proposal of building K-2 and k-3 in 2015 (nuclear reactors) in the west of Karachi which would add 2200 MW of power in national energy grid (Technology). Pakistan is the first importer of China's ACP 1000 technology which China is building in Fujian province. In order to take more orders from other countries, China is keen to show the safety and efficiency of its cost cutting technology. China has been providing loans on softer term for this technology to Pakistan. As Pakistan is facing serious issue of power shortage, China is giving an affordable solution in the form of its latest Hualong-1 reactor technology (Malik, Personal Communication November 19, 2018).

Conclusion

The discussion presented in this research paper shows that since the beginning of the 21st century, China and Pakistan have been enhancing their defense cooperation and have initiated various joint defense projects such as fighter planes JF 17 Thunder and 22P-Frigates. China recognizes the fact that Pakistan owns the high-tech defense production industry, and vast human capital resources are available, so China is keen to invest in joint defense production. China and Pakistan expect to export their defense equipment to Middle Eastern states, Asia and Africa in near future. Pakistan and China are determined to enhance aviation and naval cooperation. The current regional security environment and the emergence of non-traditional threats compelled both countries to strengthen defense cooperation.

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ASSESSING ECONOMIC BENEFITS THROUGH WASTE EFFICIENT DRIVERS IN MEGA CONSTRUCTION PROJECTS: A CASE OF PAKISTAN

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Abstract

Waste disposal has become an issue worldwide and the major cause of this issue is considered to be the construction activities producing wastes. Pakistan being the 6 most populated country in the world is considered to have a huge amount of waste due to the various construction and particularly megaprojects and this amount of construction waste is increasing consistently in the country. Pakistan produces of construction waste per year and is increasing annually by 2%. These increasing wastes and issues associated with these construction wastes lead to a crucial need for improvement of waste management practices in the construction industry of the country through various measures. Despite of the large need for waste minimization research in Pakistan, , deductive approach was used, and quantitative method was selected, the present study has used cross-sectional design. The researcher used a sample of 323 individuals and conducted a questionnaire-based study.

Keywords: Construction Waste Reduction, Waste Efficient Bill Quantity, Effective Materials Delivery Management

Introduction

Construction waste has really become an issue in projects that are mostly caused by a number of activities and practices carried out in all stages of the process of project delivery. Many past researchers have focused their efforts on studying different construction stages of projects. However, few scholars studied material procurement processes and waste efficient drivers in order to diminish the possibilities of waste in construction projects. There is seen less focus of scholars on strategies formulation and execution for using waste efficient drivers in the projects for the sake of reducing construction costs of projects. In developing economies, waste recycling and disposal is really becoming a challenge. A huge portion of waste in those countries is not properly reused and discarded by construction firms thus creating difficulties for waste management by those firms (Maleka, Nyirenda, & Fakoya, 2017). The challenge of waste generation and disposal in Pakistan is also giving tough time and causing ecological pressure on the construction firms and projects operating in the country. The growing amount of waste materials have caused a big issue of sustainability for all the construction firms and construction projects. It has created a big chaos in various construction activities and practices in the Pakistan. Therefore, waste efficient practices and techniques are largely needed by those firms and projects in order to meet with this ecological challenge to enhance and achieve their economic (Ajayi et al., 2015). The solid waste created by construction projects and its processing is really a big challenge for the community and environment worldwide. This is because waste generation per capita is continuously facing incremental trend that seems a real-time challenge for construction project managers and firms and this challenge is more serious specifically in the developing economies of nations. Due to this increased challenge and issue in developing countries, particularly the construction firms in those countries are likely to face a large pressure in terms of environmental, social and economic requirements and responsibilities because they have to diminish the ecological impacts and ecological issues and problem possibly arising due to the operations and construction activities of those firms. For overcoming and reducing this ecological pressure, the construction firms really need such operations and practices that assist them to reduce their wastes and adverse impacts of those wastes on the environment. In the EU, a regulatory framework has been set up with the Directive 99/31/EC on landfill to comply with the 3R regulations (Reduce, Reuse and Recycle) aiming towards sustainable construction. (Calvo, Varela-Candamio, & Novo-Corti, 2014). The waste generates by construction and devastation activities in the construction industry needs to be diminished

because its reduction is beneficial to both the environment as well as construction firms. Its reduction contributes to the environment by eliminating ecological issues and hazards along with contributing to the firms by reducing their costs overall.

Scholars suggest that when construction firms or projects increase their expenditure on waste management. Similarly, its practices then are likely to come in a position to diminish their waste portion and their ability to achieve targets of waste lessening is expected to augment. Consequently, the achievement of targets regarding waste reduction incorporates various economic as well as ecological benefits for the firms or projects operating in the construction industry and their profitability is expected to augment (Maleka et al., 2017). Studies also suggest that when construction projects or firms focus their efforts on the process of material procurements in terms of waste reduction. They adopt such practices and techniques that have the ultimate effect of reducing waste and cost in the process of material procurement of construction project consequently making the project waste-efficient as well as cost-efficient in those processes. These waste-efficient processes of the material acquisition have a positive influence on waste minimization of construction projects (Ajayi&Oyedele, 2018). Due to the increased significance of the waste minimization for a construction firm from both economic and ecological perspectives, the need for research on exploring and analyzing various causative elements and precautionary measures for waste minimization has evolved and heightened. Many past scholars have conducted researches and also have given a call to future researchers to conduct studies on such instrumental factors. Additionally, measures at various stages of projects like plan & design, procuring & purchasing material as well as the construction stage in order to reduce the waste and to make projects or firm waste-efficient. The inadequate management of MSW is one of the principal challenges for African cities achieving ambitious sustainable development goals (SDGs). Sustainability entails processes and services that meet the needs of the current generations without compromising the ability to serve future generations (Aryampa, Maheshwari, Sabiiti, Bateganya, & Bukenya, 2019).

However, in contrast to the activities at the stages of specific design and construction (that have been largely examined and analyzed in terms of making projects waste- efficient), limited research has been performed on the waste efficiency through the material procurement process and waste efficient drivers of construction waste and cost minimization. Following four vital waste efficient drivers and factors in process of material procurement and acquisition have been recognized in the literature that need investigation and further confirmation in terms of their contributive role in diminishing construction waste and cost of

projects to have ultimate positive influences on success and economic benefits of the construction project: (Ajayi&Oyedele, 2018).

- ‘Suppliers’ commitment to low waste measures’ (SCLWM)
- ‘Low waste material purchase management’ (LWMPM)
- ‘Effective material delivery management’ (EMDM)
- ‘Waste efficient bill of quantity’ (WEBOQ)

Problem Statement

The waste disposal has become an issue worldwide and the major cause of this issue is considered the construction activities producing wastes. The waste produced by construction practices in the construction industry needs to be reduced because its reduction is necessary for the atmosphere. Training and education is another effective way of minimizing waste generation (Udawatta, Zuo, Chiveralls, &Zillante, 2015). Pakistan is considered to have a huge amount of waste due to the various construction and particularly megaprojects and this amount of construction waste is increasing consistently in the country. These increasing wastes and issues associated with these construction wastes lead to a crucial need for improvement of waste management practices in the construction industry of the country through various measures. Furthermore, the literature on waste minimization in the context of Pakistan is limited and no study is found to give insights and assistance about waste minimization in the construction projects particularly undertaking in Pakistan. This gap of research really needs to be filled with empirical research.

The proposed study will try to find a solution to the above problem by working on the following research objectives in the context of Pakistan:

- To check the relationship between suppliers’ commitment to low waste measures (SCLWM) and construction waste reduction.
- To check the relationship between low waste material purchase management (LWMPM) and the construction waste reduction.
- To check the relationship between effective materials delivery management and the construction waste reduction.

- To check the relationship between waste efficient bill of quantity (WEBOQ) and the construction waste reduction.
- To check the relationship between the construction waste reduction and the economic benefits to the construction project.

Literature Review

The Pakistan is facing the serious challenge of waste and its disposal particularly at construction sites and it is deliberated as one of the major producer states of waste. According to the Pakistan Interact (2007), 75 percent of the total waste produced in the Pakistan is considered to be produced by the construction industry. In terms of waste proportion per capita, Pakistan comes at the second number to the USA in the ranking of all countries of the world according to the waste share per capita. Pakistan is expected to have a large number of landfills for the dumping of huge amounts of construction waste and this amount of construction waste is increasing day by day in the country. In addition, a study has shown that construction waste minimization also needs to focus on the design stage of pre-construction projects, which can directly reduce construction waste from sources (Wang, Yu, Tam, Li, & Xu, 2019). These increasing wastes and issues associated with these construction wastes cause an urgent need to arise for improving waste management in the construction industry of the country through waste efficient techniques and processes. As the construction industry of PAKISTAN is booming extraordinarily due to a large number of mega projects and construction contracts that in turn are likely to enhance the waste and ecological concerns, therefore, the need for improving the positive attitude of builders and construction contractors towards waste management and its measurements has augmented. Many prior studies suggested the need for ecological concerns arising due to such mega projects in Pakistan (Lin & Raza, 2019).

Constructions wastes are actually the by-products produced and eliminated from construction, restoration, and destruction at factories or at sites of construction or at public manufacturing structures. Construction waste is described by Environmental Act (1990) as, “Scrap material or effluent or other surplus substances arising from the application of any process.” The construction waste is produced at various stages of a construction project that needs to be reduced at each stage in order to achieve overall waste reduction targets. The past studies suggest many source factors for construction waste but the four main source factors and activities of waste generation in a construction project. There are dominant and recognized in the literature that is ‘design, procurement,

holding of material and operations of construction' When performing the stage of design of a construction project, a huge amount of waste produces due to several design issues (Huang et al., 2018). It is revealed in past literature that the design of construction projects has a major impact on construction waste thus requiring designers to use models for producing designs that are waste efficient. In this way, the waste minimization process is encouraged and started at the starting stages of the construction projects. On the other hand, the lack of effective regulation is not the root cause of these disparities in Europe. The relationship between environmental innovation and policy is also important (Le Hesran, Ladier, Botta-Genoulaz, & Laforest, 2019).

Waste minimization is about the set of activities carried out to diminish the waste. The activities that are encompassed in waste minimization are first of all waste inhibition in which the construction waste is prevented to be produced, secondly re-use of waste produced and thirdly, the recycling of waste to convert it to something useful. The waste inhibition can be achieved through waste efficient drivers at construction sites. These drivers may encompass industry, governmental policies and constraints, economy and environmental principles. The government may induce waste minimization in construction projects through various strategies and tools including policies, contracts, etc (Umar, Shafiq, & Isa, 2018). Some environmental standards serve as means for construction projects and firms to diminish their waste generation and its impact on the environment as well as to induce their waste minimization.

There are many financial advantages associated with waste minimization because there is a huge cost that is incurred for waste disposal. Therefore, if a construction project or firm works on waste minimization in the stages of the project then it can avoid that huge cost associated with waste disposal. These financial benefits enhance the economic worth of waste minimization along with its ecological worth for firms. A large number of studies have been performed in order to examine the significance of waste minimization, its various drivers and their contribution towards economic benefits to the construction projects or firms (Ajayi&Oyedele, 2018). However, no such research has been performed in the context of Pakistan and Pakistan to investigate these phenomena in the construction projects undertaking particularly in Pakistan.

The planning of material logistics has gained increased importance in construction projects because it can act as a strategic device for the effective operations and

management of the construction projects. Material logistics planning is actually about the management of a set of activities involved in the purchase of material, its storage, its wastage and disposal, its alteration and its delivery. The activities involved in this whole process are covered in material logistics management. Its proactive and effective management is likely to enhance economic benefits for the projects by decreasing cost. Along with cost-saving benefits, it is also expected to have a contribution towards the environmental performance of the project by realizing the sustainability of the construction environment. The enhanced contribution of the management of material logistics towards environmental stability has galvanized the increased awareness about the environmental effects of material logistics (Guzzo, Trevisan, Echeveste, & Costa, 2019). Along with environmental impacts, a large number of past studies are found in the literature that suggests the importance of material procurement measures and their proper management in promoting construction waste and cost reduction. The critical measures used in this process have the potential to diminish the cost and waste of the construction project. Procurement measurements can serve as significant tools for waste minimization in the purchase material stage thus contribute to the overall waste reduction of the project throughout the supply chain.

There are four significant measures recognized in the literature that can assist firm or projects to achieve a waste reduction in material procurement process i.e. the commitment of suppliers towards waste efficient measures, waste efficient purchase management, effective material delivery man agent and low waste bill of quantity (Ajayi&Oyedele, 2018). The SCLWM requires the suppliers to be flexible for supplying varying quantities, the modification and alignment of products with design, determination for plan take back for recycling and reusing materials, providing quality product and avoiding the use of extra packaging. When these measures are adopted at the stage of material procurement then potentials of cost and waste saving enhance. Therefore, the first hypothesis of the current study will be:

LWMPM measure in material procurement enhances the acquisition of such materials as well as technology that is waste efficient and incur a minimal cost and waste at the construction site. It promotes the acquisition of the secondary material for recycling and reusing it. The purchase of such material is encouraged through LWMPM measure that material is suitable, correct and is of good quality in order to avoid the waste and extra cost required for its alteration and any other logistics management (Ajayi&Oyedele,

2018). The proper adoption and management of these measurement activities are likely to diminish the construction waste of the projects. So, the second hypothesis of the current study will be:

EMDM measure is also very important for decreasing the waste portion in the procurement process and in the overall construction. Through this measure, the material is properly endangered during the whole process of transportation, stacking, releasing, etc. for avoiding any waste or cost. The delivery schedules are effectively formulated and applied in order to avoid any delay in the procurement process. The most effective measure that is used under EMDM is the use of 'Just in time inventory' in which the chances of waste of material as well as cost decrease (Ajayi&Oyedele, 2018). These all measures are very likely to have potentials for waste as well as cost minimization in the whole process. Thus, the third hypothesis of the current study will be:

The consideration of WEBOQ requires the procurement process to take off correct materials and to avoid extra or less ordering. It enforces the managers to order the appropriate amount or quantity of material that is exactly required for the construction process instead of under or over-ordering. When the bill of quantity includes the consideration of waste efficiency then it bounds the managers to minimize the allowance for waste. All these practices in this measure, in turn, contribute towards minimization of the waste and cost in procurement processes (Ajayi&Oyedele, 2018). Thus, the forth hypothesis of the current study will be:

The construction waste reduction achieved through various measures then, in turn, has the potential to generate many economic benefits for the projects. It augments the chances of cost cut due to the waste minimization and efficiency of the stages of the project. These cost cuts ultimately enhance the profitability of the construction projects or firm. Therefore, it is suggested that waste reduction is likely to generate several economic benefits the profitability from which seems a prominent economic benefit (Platonova, Asutay, Dixon, & Mohammad, 2018).

Methodology

Quantitative method is selected because this study give us the findings of results by descriptive statistics for the sake of getting the relationship of variable with another variable

and to identify the effect of one variable on other. Quantitative method is used because of minimum budget and time. Because as discussed earlier qualitative needs extra time for interviewing, and getting a common result by different opinion. Other reason of choosing quantitative is to avoid biasness in research. Sample size relays on selected target population, technique of analysis, time and resource availability. Sample size is selected is 350, almost 400 questionnaires were distributed and response from 323 respondents was received. Data is collected through survey based questionnaire from the construction industry of Pakistan.

Discussion and conclusion

The purpose of this study was to assess the economic benefits through waste efficient drivers in mega construction projects in context with the Pakistan. Our first hypothesis was Suppliers' commitment to low waste measures (SCLWM) has a positive and significant influence on the construction waste reduction. According to the results of structural equation modeling the hypothesis has been accepted. In past research ([Paz & Lafayette, 2016](#)) has also tested this hypothesis which was accepted. Our second hypothesis was low waste material purchase management (LWMPM) has a positive and significant influence on the construction waste reduction. According to the results of structural equation modeling the hypothesis has been accepted. In past research ([Barbudo, Ayuso, Lozano, Cabrera, & López-Uceda, 2020](#)) has also tested this hypothesis which was accepted. Our third hypothesis was Effective materials delivery management has a positive and significant influence on the construction waste reduction. According to the results of structural equation modeling the hypothesis was accepted. In past research ([Galán, Viguri, Cifrian, Dosal, & Andres, 2019](#)) was conducted in which same hypothesis was accepted. Our fourth hypothesis was Waste efficient bill of quantity (WEBOQ) has a positive and significant influence on the construction waste reduction. According to the structural equation modeling this hypothesis was rejected. In past researches ([Hoang, Ishigaki, Kubota, Yamada, & Kawamoto, 2019](#)) this hypothesis was also tested which was rejected. Our fifth hypothesis was Construction waste reduction behavior has a positive and significant influence on the economic benefits of construction waste minimization. According to the results of structural equation modeling the hypothesis has been accepted. In past research ([Esa, Halog, & Rigamonti, 2017](#)) has also tested this hypothesis which was accepted. Our sixth hypothesis was construction waste reduction behavior has significant mediating role in the relationship between supplier's commitment to low waste measures and economic benefits of construction waste minimization. According to the results of structural equation modeling the hypothesis has been accepted. In past

mediating role with the independent and dependent variable has not be checked but studies has been conducted discussing these variables individually which rely with our results. Our seventh hypothesis is Construction waste reduction behavior has significant mediating role in the relationship between low waste material purchase management and economic benefits of construction waste minimization. According to the results of structural equation modeling the hypothesis has been accepted. In past ([Huang et al., 2018](#)) mediating role with the independent and dependent variable has not be checked but studies has been conducted discussing these variables individually which rely with our results. Our eight hypothesis Construction waste reduction behavior has significant mediating role in the relationship between effective materials delivery management and economic benefits of construction waste minimization. According to the results of structural equation modeling the hypothesis has been accepted. In past mediating role with the independent and dependent variable has not be checked but studies has been conducted discussing these variables individually which rely with our results. Our ninth hypothesis is construction waste reduction behavior has significant mediating role in the relationship between waste efficient bill of quantity and economic benefits of construction waste minimization. According to the results of structural equation modeling the hypothesis has been rejected. In past ([Akinade et al., 2016](#)) mediating role with the independent and dependent variable has not be checked but studies has been conducted discussing these variables individually which rely with our results.

Conclusion

In the proposed study, the impact of economic benefits was assessed on the material procurement measures by keeping construction waste reduction behavior as mediator. This was investigated in the context of Pakistan. Results shows construction waste reduction behavior has positive impact on supplier commitment to law waste measures, low waste material purchase management, waste efficient material delivery management for gaining economic benefits. While waste efficient bill of quantity does not seems to be impactful in the construction industry of Pakistan. By applying the material procurement measures discussed in the study economic benefits and the construction waste reduction behavior can be achieved. It will be a quantitative study that will contribute theoretically to the literature of waste reduction and will enhance its scope by checking its applicability in Pakistan.

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**CORONA PANDEMIC: ANALYZING THE RESPONSE OF
US, CHINA, RUSSIA, INDIA AND PAKISTAN**

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Abstract

This article is an effort to examine socio-political and economic impact of COVID-19 to state system global politics. Further, this study analyzes the response of US, China, Russia, India and Pakistan to Covid-19.

Introduction

Starting in December of 2019, first suspected as a mild cold in a seafood merchant of Hua'nán market was proved to be a fine example of “Butterfly” or you may call it “Domino” effect. At first it was taken by the world community an epidemic later regarded as a global pandemic engulfing over million of earthlings in matter of days, responsible for seizing its originating country and crippling the world’s economy. As this viral pandemic started to grow people around the world began to speculate its causes, its immense socio-political effects and daily increase in number of patients by many folds. But there is something else that spread earlier than virus, COVID-19, itself and that is the “panic” caused by it. And there is the reason for this panic, COVID-19 single-handedly became a cause of decease for nearly 30,000 people in just three months, while hospitalizing half a million (ABCnews). States, that were not yet recorded any case or effect, began to formulate emergency responses, markets around the world saw momentous outrun of sanitizing products and some started to fabricate it as a biological war that would be limited to a certain region or country. While some states that didn’t consider it as deadly or longed for epidemic to enter their borders to drive any action, COVID-19 proved to be very harsh on them.

Analyzing the response of US, China, Russia, India and Pakistan

In China, Initially the response of Chinese government was measured; the authorities suppressed the voices of citizens as well as doctors regarding this deadly disease in Wuhan. Authorities turned deaf years toward the warnings of doctors by saying labeling their warnings as “lies”. This outbreak is not recent, but since December, Ophthalmologist Li Wenliang signaled that a group of doctors as well as the seven whistleblower scolded by the Chinese authorities for the sake of spreading illegal and misinformation vis-à-vis a virus on social media, that’s shows there was something that has been occurring internally in Wuhan that was not spread publicly.

When the disease declared publicly, at central level under the chairmanship of Chinese Premier Li Keqiang a meeting organized on January 25, 2020. After that meeting two days later Chinese Vice Premier Sun Chunlan visited Wuhan in order to guide the work to eradicate epidemic in Hubei province, in the fight again this pandemic the model that was adopted after 2008

Wenchuan earthquake again implemented. Under this model, the 16 provinces will provide support to the cities that are outside Wuhan which means that one province will be united with one city. In the response of such epidemic Government established two hospitals Houshenshan (Fire God Mountain) Hospital and Leishenshan (Thunder God Mountain) Hospital within 10 days. These two hospitals were established only to treat coronavirus patients. Cities also made strict control over the exchange of personal travel and exchanges. (TheDiplomat, 2020/02)

In the hours of dire need, Indian government was the first on which provided 15 tons of medical assistance that was consist of masks, gloves, and other equipment to China on 26 February 2020. (CNBC, 2020/03).

In Us, on state level, many bills as well as legislatures has been passed at central level in the fight against this epidemic. State or Public health emergence declared in each and every territory of state in response to such virus. Almost 32 states introduced legislature including resolutions and bills which consists of funding, disease surveillance, medical coverage, isolation and quarantine all are part of the actions taken by governors in state of emergency. The approach that has been used at state level is whole-of-America Approach, an economic package formulated for the infectious persons (TheDiplomat,2020/02).

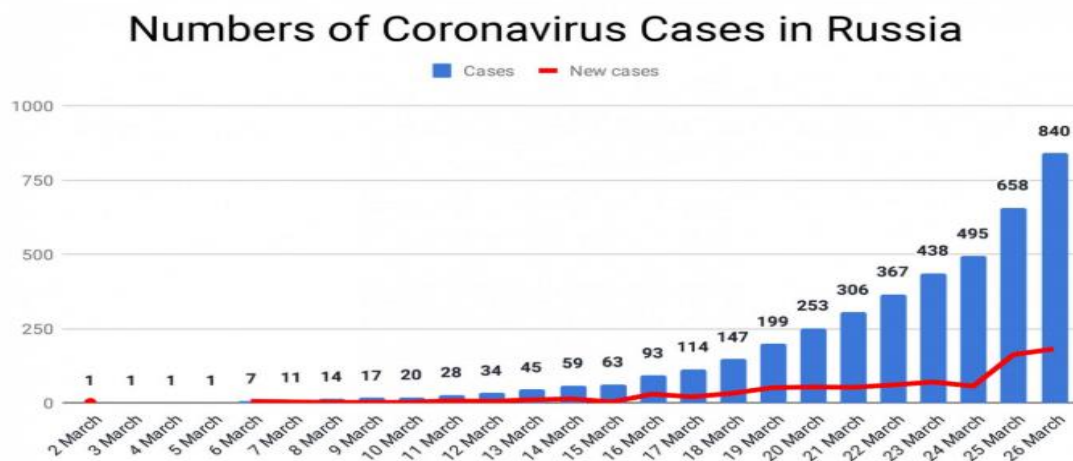
At national level, new guidelines were introduced, which included the ban over traveling, shut down bars, closing schools as well as food courts etc. for 15 days. It was also allowed the no permission is required in order to fulfill the growing demand of respirators from federal. Trump signed a coronavirus relief package that contains free test of the patients of COVID-19 In a speech Trump said that “Gatherings Should Be Limited to 10 People”

The economy of US affected drastically by this virus as the oil prices slid below \$30 a barrel, large business groups and local groups are begging the federal government to pay trillion of dollars in order to pay the salaries of workers that are stayed at home. Workers who are affecting by Coronavirus and staying at home would get 2-3 of their pay. (CNN, 2020/03/18). The Kentucky Derby first time in history postponed that was supposed to held in first Saturday of March but now it will take place in September, this race was suspended firstly in 1901 and then in 1945 due to WWII. (NYTimes, 2020/03/16). US administration is actually using the Defence

Production Act under which the center would request to pharmaceutical companies to boost the supply of Coronavirus supplies to treat COVID-19 patients. In a tweet Trump said:

“I only signed the Defense Production Act to combat the Chinese Virus should we need to invoke it in a worst case scenario in the future. Hopefully there will be no need, but we are all in this together” (TheVox, 2020/03/18).

In Russia, since the spread of corona virus not limited to China but its blowout globally, Russian was also affected as 840 cases of Corona virus confirmed in Russia. On national level government shut down all the flights to other countries since March 27, all the shops have been closed on the direction of government only pharmaceutical and grocery stores will be open. All the cultural festivals and large gatherings were strictly banned by the government. The health sector is urging the patients of those mild infections to recover at home rather than admitting in hospitals. The Republic of Chechnya is the first region under the Russian control where complete lockdown has been observed because the first case of corona virus identified at this region. (TheMoscowTimes, 2020/03/26).



(Source: The Moscow Times)

According to economist Luis Garicano, the epicenter of this virus is being shifted towards Europe, that's why lockdown is being practicing in almost every state. With this shift the supply chain is also being stagnate, no one is sure when it will completely be eliminated but its consequence are so deep in the term of economy, it is expected that its aftermath would be much more severe than the financial crisis of 2008.

President of European Union Ursula von der Leyen also formulated a comprehensive response in fight against this deadly virus, that response composed of measures such as, ensure the supply of medical equipment across the Europe, on the fiscal rule complete flexibility was given to all the European Union nations, for the support of health sector as well as small businesses EUR 37 billion Coronavirus Response Investment Initiative introduced, for the protection of borders a comprehensive guideline granted to all state in the form of suggestions such as ban on exchange of citizens over borders, it make a strictly prohibited non-essential flow of travelers to EU. The mechanism for the Crisis coordination of Commission has been activated and the meeting of the members made mandatory in the context of this outbreak. (Europa, 2020).

India is largest state after China in the term of population, it a union consists of 28 states and 7 territories, the Seventh Schedule of Indian constitution empowered both the union as well as states to formulate policies on the affairs of public health independently. The Union law deals only with the port quarantine means all the affairs that are related to seaman's and marine hospitals are fall under the jurisdiction of Union, on the flip side, all the affairs such as hospitals, dispensaries, sanitation and public health came under the control of state government but it is the mutual responsibility of state and union to prevent transmission of disease from one state to another.

On national level, on the direction of Prime Minister Modi, a group of ministers (GOM) established in order to supervise and review all the measures taken by Indian government in the wake of this coronavirus outbreak. Government made restrictions over traveling, visas suspended; only the diplomats and the government officials can travel abroad. For Overseas citizenship of India card holders' visas also suspended till April 15, 2020. For 21 days nationwide lockdown imposed in the state on the direction of Prime Minister. He said that "Every state, every district, every lane, every village will be under lockdown," (NYTimes, 2020/03/24).

Due to the proximity of Pakistan with the epicenter of this deadly virus i.e China, and with the state that is second largest in coronavirus cases after China i.e Iran, the treat for Pakistan is very visible as Pakistan shared its border with these two states. Initially no case was reported in Pakistan, but after the influx of passengers from abroad, this virus started penetrating in Pakistani society and more than 1,000 cases has been reported since last three weeks, this ration is

reaching its peak with each passing day. In this state of emergency, Pakistani government formulated a National Action Plan for Corona virus disease (COVID-19) Pakistan, this 136 pages documents consists of all the measures as well as guidelines for citizens. The response of Pakistani government is considered to be the “timely” best national response” in the overall world. Dr Palitha Gunarathna Mahipala, the country head of WHO said that “at a time when other countries were reporting cases, Pakistan was keeping the virus at bay, which is something quite praiseworthy.”

“At the moment, Pakistan has seven diagnostic labs which are capable of conducting 15,000 tests, but there is a need for more diagnostic facilities in case the number of suspected patients go up,” (TheGulfNews, 2020/03)

In the case of Iran, initially the situation was alarming because government did not take it seriously, no particular actions in the context of coronavirus has been taken by Tehran. The below picture that has been taken on March 18, 2020 depicts, the irresponsible behavior of government, this heavily crowded highway between Tehran & Qom that are epicenter of this



deadly virus is raising serious questions regarding government efforts, in its fight against coronavirus. (Source: BBC News)

Since the increase in the death toll and reported case, a seriousness has been observed in the behavior of state, all the educational institutions, and public gathering spots have been closed by the government, all the religious and cultural practices have been suspended in the state for 15

days. (BBCNews, 2020). One of the reasons for fragile state towards this deadly disease is US imposed sanctions on Iran, that's why state is unable to facilitate the bulk of patients.

There are many reasons that why creating a vaccine for virus would take billions of dollars and unexpected time. COVID-19 is new, how it behaves, reproduces and spreads is still ambiguous to scientists around the world. The most common way of making vaccines is called "attenuated vaccines" (WeForumOrganization, 2020/03). This way includes injection of tiny dosages into body, prepared outside by a weaker strains of actual pathogens. The trials of vaccinations need a lots of test, vaccines must be meticulously tested to assure their working and see if there is any side-effects.

States around the world, joining hands with various welfare organizations and qualified teams of scientists are working to create experimental vaccines. Total number of research groups, industries and pharmaceutical companies working to cultivate vaccine, listed by WHO, are currently 41. Here let us see an overview of some of such exertions:

Professors at London school of Hygiene and Tropical medicine are working with Moderna, a biotech agency working in Cambridge, Massachusetts. Moderna is currently funded by USNIH. Scientists and professors working there consider themselves in a race and working to include all possible options and platforms for development of vaccine.

Organizations like Bill and Melinda Gates Foundation funded spin-out companies like: DIOSynVax. DIOSynvax was also funded by UK innovation agency (UKIA) to develop new and better vaccinations for influenza and Ebola virus. Now, with again funding of UKIA, DIOSynVax has sharpened its focus on developing of vaccine to counter COVID-19 only.

Another effort by UK is from researchers at Oxford University. They are planning to start first trails on human in start of May. The essence of virus they are using is created artificially, unable to replicate in human body. This is rumored to be the top dog vaccine produced in UK.

Germany is also heading forward in this race. African based foundation CEPI or Coalition for Preparedness Innovation funded an enormous amount of about \$8 million to a German based CureVac. European Investment Bank also offered CureVac a loan of about 80 million euros. This company came into spotlight as President Donald Trump tried to get his hands on the

company because of its advance technology and high-end laboratories. The largest shareholders are billionaires Dietmar Hopp and Bill Gates.

Another German based company, BioNTech is testing its fortune for developing mRNA vaccine. Company was in agreements with Pfizer, a Shanghai based pharmaceutical company and recently tested on mice in lab in Mainz. They are scheduling to test on humans in April (ScienceBusinessMag, 2020).

China has established a six month trial program for testing of an experimental vaccine, with help of biotech CanSino Biologics based in epicenter of pandemic, Wuhan. Eight candidates were recently recruited in the program.

Funded by USA and government, Migal-Galilee institute in Israel is also working to provide with their version of vaccine. This institute already hailed a scientific breakthrough early this year by isolating COVID-19. Human trials are expected to start by end of April.

State and federal government in Australia provided University of Queensland with almost \$17 million to mark their flag in race. Other shareholders are CEPI and Paul Ramsay foundation. They claimed to produce vaccine in early of 2021 and six more months to start human trials.

Investment of Canadian government is over \$23 million over its vaccine manufacturer VIDO-InterVac. VIDO-InterVac previously produced successful vaccine for SARS and Zika Virus. This institute is working swiftly and claimed to produce testing vaccinations in less than 3 weeks.

With all these developed countries, contributing in development of vaccine the part of USA is comparatively more. It seems like the superpower is way ahead in this race with large investments not only in local companies but in firms abroad, including UK, Israel and Australia. Other USA-Based companies are Johnson & Johnson, Novavax, and Inovio Pharmaceuticals (ScienceBusinessMag, 2020).

With the spread of COVID-19, many conspiracy theories began to circulate. The prediction of spread mentioned in a novel written back in 80s to accusation on Chinese scientists in Canada working on some deadly viruses and pathogens, possibly making a bioweapon (TheDiplomat, 2020/03). These conspiracies have their effects on official arrangements of states as-well. Chinese administrators are blaming USA army for bringing the virus in mainland China and

Tweets by USA president renaming COVID-19 as “China Virus”. Question arises that why people around the world find it comfortable to share an idea of conspiracy, blaming states and institutions for creating and spreading of COVID-19? Answer may not be difficult if we set sail to debunk such theories.

Particular outcome of such theories, when they began to circulate in society, is it tears down trust of people on their governments. Many revolutionaries sees it as an opportunity to get in control with valid arguments. For example recent data from PEW research institute in USA estimated that about 29% of public in USA considers COVID-19 as a bioweapon. This number may seem comparatively small but when it comes to the government institutions and the orders of staying isolated and avoid gathering, people show distrust and consider it as a suppression by government. Another report by ‘the Verge’ (TheVergeMagazine, 2020/03/20), shows the confusion complex in people. As the spread was rapid and decisions taken by states were aggressive and strict, general public felt vulnerable, they began to gravitate towards any idea that provides them with any logical explanation, so why not a conspiracy that grips their minds with valid arguments.

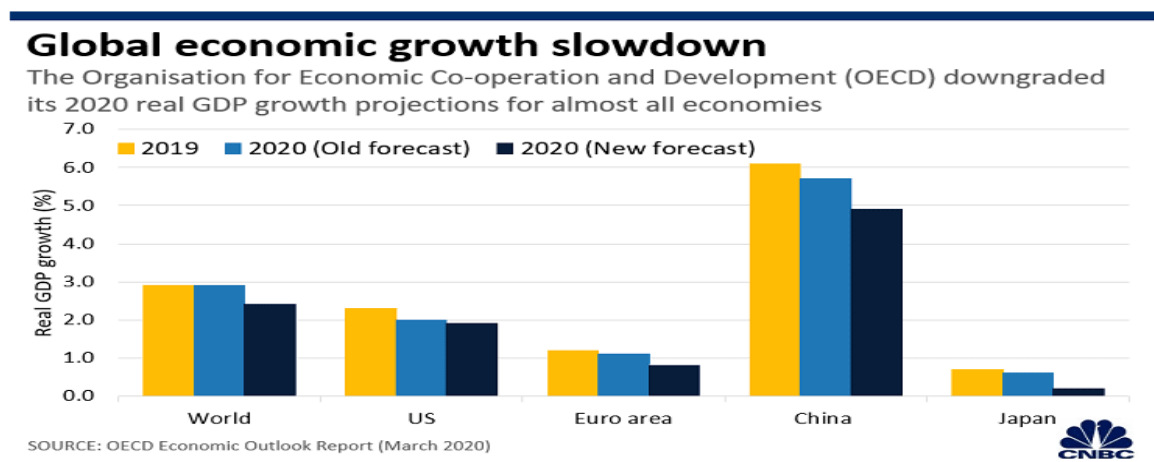
But then there are governments that are now pushing these conspiracies (TheBulletin, 2020/03), for example the USA politicians adding to the flames by blaming China as the mastermind behind virus and bioengineered it. This gives theories an escape point that these conspiracies are not fabricated by some random person with a laptop and internet connection but by governments to gain maximum public support.

Now, if we talk about China and its response, we have to look before the spread of epidemic. Relations between USA and China were actually quite worse. Administrations on both sides found this epidemic as another opportunity to further deteriorate this relationship. One cannot easily comprehend that the government officials are so prone to discuss conspiracy and thus blame each other on international forums. For example the blame on American visitors in November of last year who came to China with lungs illness or the use of E-cigarettes is the cause of COVID-19. It was the USA policy makers and politicians who brought China into this nasty debate and blame-game first. For instance, Pompeo called COVID-19 as ‘Wuhan Virus’ (TheEconomicTimes, 2020/03) which provoked the people and government of China and in response Chinese ministry of Foreign Affairs criticized USA and President Donald Trump

through media channels i.e CGTN for talking racism and complimenting xenophobia during crisis with no action in terms of aid and assistance.

In amidst of crisis governments, policy-makers and politicians must not overlook the fact that these conspiracies can damage social support required to fight the virus. Aid and assistance to potentially poor states is imminent while there is always a chance for a new theory to venture. Head to head rivalry of USA and China can overturn to other states like UK and Italy and with the increase in this tussle can China blame Angela Markel for bringing the virus to Wuhan in her visit last year?

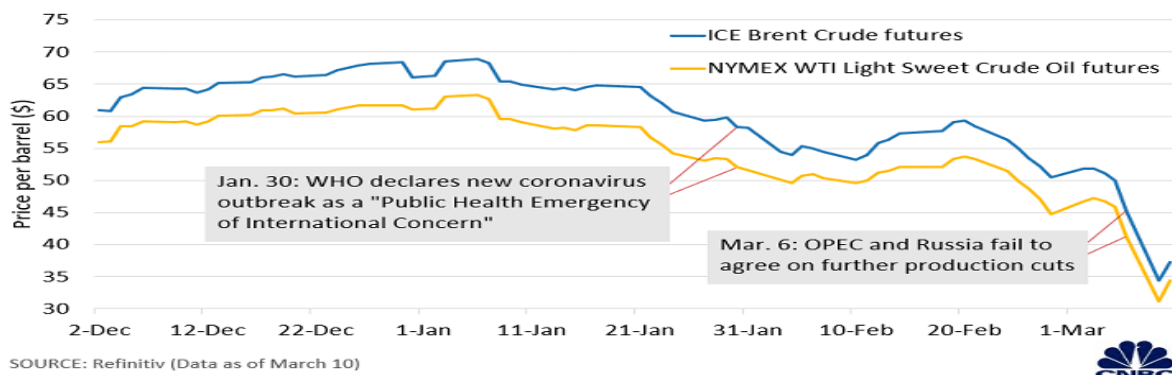
Globally very deadly impact has been observed of this global pandemic, this virus became one of the largest threats to the economies of the world and financial markets. According to Ben May, head of global macro research at Oxford Economics: “from an economic perspective, the key issue is not just the number of cases of COVID-19, but the level of disruption to economies from containment measures,”



According to OECD economic outlook report of March 2020, a visible change has been observed on the overall economic growth, fig. 3 and 4 describe this case. (Lee, 2020)

(Source: OECD Report)

Slump in oil prices



(Source: Refinitiv, Data as of March 10)

One thing we certainly know about COVID-19 is that it can be avoided, just like any other plague we are determined to find its cure someday soon but before getting our hands on vaccination we must externalize this issue and deal it for the betterment of whole humanity, not for a specific nation or for any particular interest. We must not give any space to conspiracy, particularly in these hours of panic and crisis. Great Powers must help incapable states in form of medical aid and assistance rather than treating this epidemic as a stage to perform political acts. A comprehensive and whole-of-globe approach is required in the fight against this virus. Whatever the case is, it eventually comes down to us and how we deal it, we must listen to authorities and hope for a better future.

Pakistan Response to Corona Pandemics and its Impact on International Relation

As of 26 March 2020, the number of confirmed cases in the country is 1,179, with 21 recoveries and 9 deaths. World Health Organization has appreciated Pakistan for taking meaningful and timely steps deal with Corona Virus. However the gradual but strict steps of Pakistan and economic vulnerability are border oriented thus impacted Pakistan's international connectivity and relations even with 'iron-friend' China and brotherly countries like Afghanistan, Saudi Arabia and Iran. Pakistan has requested for technical and equipment from other countries like Germany and Turkey as well. The Corona Pandemics has impacted Pakistan's economy therefore it is now looking towards International Financial Institutions like IMF, World Bank and Asian Development Bank.

Flight Operations:

The Pakistan Civil Aviation Authority (CAA) initially introduced screening measures at Islamabad, Karachi, Lahore and Peshawar airports for every passenger arriving from China. But as the Corona Pandemic situation gets worsen internationally, the Pakistan International Airlines (PIA) decided to suspend the flight operation between Pakistan and China, Saudi Arabia, USA, Europe and other parts of the world.

Land Borders

Pakistan closed its borders to travelers from Afghanistan at the Chaman border. The border is only partially opened for transportation of food items while pedestrian movement remains suspended. The same Strategy is also applied to the land border with Iran. Further, Pakistan-China, and Pak-India Borders have also been closed for two weeks.

Economic Relief Package and Medical Assistance

Lieutenant General Muhammad Afzal, the NDMA chairman, announced that the government is working on securing resources for healthcare workers. So the federal government requested to China and Germany for ventilators, medicines and other medical equipment to deal with Corona Pandemic effectively.

The Republic of China has declared to send 200 of its expert physicians to Pakistan amid the outbreak of the coronavirus. Economic Affairs Minister Hammad Azhar declared that China has provided aid worth \$4 million to Pakistan, alongside 14 metric tons of PPE, including face masks, thermometers, gloves and gowns and ventilators.

The federal government sought \$10 million from the non-development funds of the World Bank and offered financial assistance to Sindh.

The Foreign Minister Shah Mehmood Qureshi raised the issue of external debt faced by Pakistan and how it should be relieved in repayment of loans on the phone with Heiko Maas, the German Foreign Minister. Qureshi reportedly told Maas that united efforts were required for dealing with the pandemic and that debt relief could help Pakistan in better handling of the outbreak in the country. In response, Maas assured him that the issues would be raised at the forthcoming G7 meeting and the European Union Foreign Ministers' Conference.

Role as Responsible Regional Player

on 24 March the Foreign Minister of Pakistan further communicated with French Foreign Minister Jean-Yves Le Drian and the Spanish Foreign Minister Arancha Gonzalez that Iran neighbors Pakistan and people have cross borders traveling for religious activities therefore Iran's bad conditions can impact adversely therefore economic sanctions on Iran should be lifted immediately so it could utilize its own resources to fight the ongoing outbreak there. Mr. Mass also echoed the need to lift sanctions on Iran on calls with the

Conclusion

The efforts to deal with Covid-19 by states with the help of World Health organization (WHO) are admirable. WHO is urging all countries to prepare for the potential arrival of COVID-19 by readying emergency response systems; increasing capacity to detect and care for patients; ensuring hospitals have the space, supplies and necessary personnel; and developing life-saving medical interventions. States in their own operational capacity are working around; Preparedness & Response, Containment and Mitigation.

However, the states are recommended to work on the following areas to enhance capacity to deal with Covid-19:

- i) Assessments of risks and capacities to determine priorities for emergency preparedness.
- ii) Enhancement of capacities at POE particularly effective screening protocols.
- iii) Surveillance and early warning, information management. • Access to diagnostic services during emergencies.
- iv) Basic, safe health and emergency services.
- v) Risk communications.
- vi) Research development and evaluations to inform and accelerate emergency preparedness.

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NEXUS BETWEEN CLIMATE CHANGE AND HUMAN SECURITY: IMPLICATIONS FOR PAKISTAN

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Abstract

Pakistan is facing one of the most critical issue that is Climate Change (CC). To justify this assumption, the study explains the link between climate change and human security. In most of this climate change and national security connection work, many scholars have put efforts to connect climate change with the non-traditional security. The study first explains the concepts of CC, human and national security and then explains the nexus between the two. Further, the CC cause serious threats to human and national security of Pakistan like increase in temperature, precipitation, rising sea levels, melting of glaciers and other environmental conflicts which leads to the conflict and instability at the domestic and national level which has negative implications on the security of the state. This paper comes with the policy recommendations at the national level for Pakistan to reduce the impact of CC on the security of the country. To ensure the human security, the study concludes that to cope with the challenges of climate change is the need of the hour.

Keywords: Climate Change (CC), Human Security, Pakistan, Conflict, United Nations General Assembly (UNGA), Intergovernmental Panel on Climate Change (IPCC)

Introduction

Over the last few years, the phenomenon of CC has turned into a very serious challenge, which was mainly an environmental issue before. It is currently the most debatable challenge for the security and the development of the whole world. At present, if climate change could not be controlled effectively, it can have severe consequences for the national security settings of the state.

CC is a critical issue for South Asia specifically for the national and human security of Pakistan. There are various challenges which Pakistan is facing related to national security as well as sovereignty and further increase in climate change is making the situation worse. If a state is weak and the society is unable to face the climate issues, it results in environmental conflict which has negative implications for the human security which in turn leads to insecurity on national as well as international level. The sensitivity level of CC can be seen from the issues related to food insecurity, floods, droughts, scarcity of water resources which greatly affects the agricultural and economic sector and has direct impact on the human security of Pakistan. It is a very serious national security threat to the country but there are limited policies and research work on this serious matter.

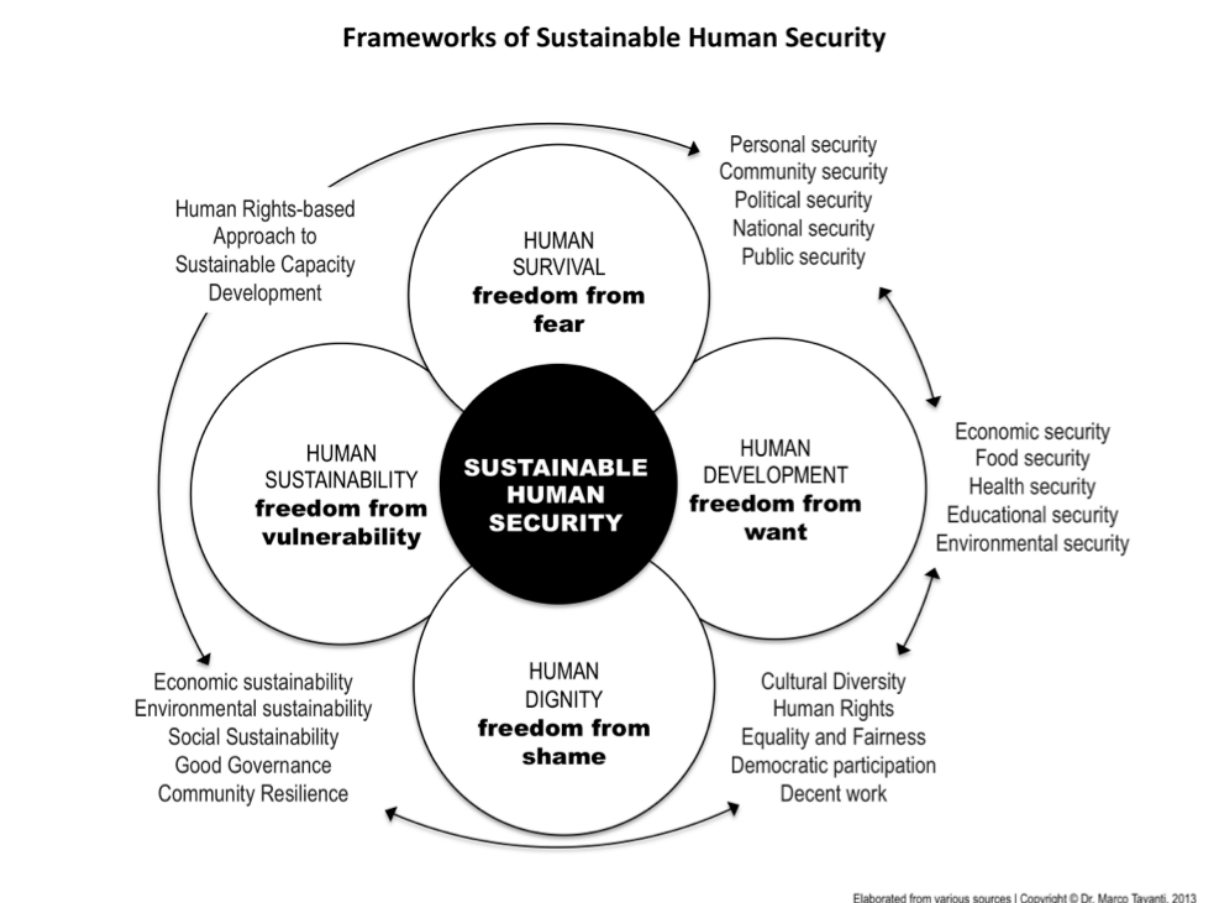
However, there is a continuous struggle in finding the connection between CC and national security. CC is seen as a “threat multiplier” which is capable of creating political instability and violence. “Climate change could create risk of major disruptions to economic and social activity, on a scale similar to those associated with great wars and economic depression of the first half of the twentieth century.” (N, 2007). This could easily disrupt the social unrest, tensions and conflicts in the society.

In this paper, the whole focus is on a serious issue which is climate change and how it links with human security, which is directly connected to national security. It would try to find out the link between CC and national security, would also try to discuss whether CC is a threat to human security and draw inferences on how CC is challenging the human security of the country. The question arises whether CC is a threat to national security and increase in the changing climate leads to threat to the non-traditional security (Tariq Waseem Ghazi, 2016) and put light on the human security aspect.

This paper first discusses the relationship between CC, human security and national security to find out whether this relation exists or not. Then, it discusses the implications of climate change particularly in Pakistan. This section highlights the major issues due to climate change specifically in Pakistan and how they impact on the human and national security. Then, in the next section it highlights the policy framework for dealing with the CC and human insecurity nexus. The paper concludes that it is the need of the hour to stand up against the menace of CC and the effects caused due to it to ensure the human security in Pakistan.

Climate Change and Human Security Nexus

Before understanding the nexus between CC and human security, we firstly have to know what these terms actually mean, then we would be able to further understand the relation between the two. CC can be best defined as “significant changes in global temperature, precipitation, wind patterns and other measures of climate that occur over several decades or longer.” (Science & Climate Change, 2019). According to General Assembly resolution 66/290, the human security can be defined as “people-centered, comprehensive, context-specific and prevention-oriented responses that strengthen the protection and empowerment of all people.” Human security can best be understood through the diagram given below:



Source: (The International Journal of Sustainable Human Security)

There has been a constant argumentation about the different perspectives on whether the climate change should be viewed as a serious challenge to national security or not. At present, a various report, proceedings, articles and steps are taken which proves that CC is no doubt a concern whether it is of human or national security. The relation between CC and human security is an old discourse, it is evident from a conference in Toronto, Canada in June 1988, “The Changing Atmosphere: Implications for Global Security”, which pointed out the major threats on the international security caused due to climate change (Usher, 1989).

Former UN Secretary General Kofi Annan defined “environmental disasters” like increasing droughts and intensity of storms as “one of the threats to human security” (Annan, 2000). In the Fourth Assessment Report of IPCC, the UN General Assembly (UNGA) had a debate on “Climate Change as a Global Challenge”. The conference focused “to intensify the UN agencies efforts in considering and addressing climate change, including its possible security implications.” (“Climate Change: the Science, the Impact and the Adaptation Imperatives & Mitigation Strategies in the context of sustainable development”, UN, 2007)

A report was also submitted on “climate change and its possible security implications”, which mainly focused on the relation between CC and national security. The report highlighted five threat multipliers posing threat to security due to climate change, which are: One, heavy floods and droughts badly decrease the agricultural yield and greatly affect the health of the people, which result in human insecurity. Second, climate change reduces the socio-economic growth of the country which results in ineffectiveness and poor management of the state. This leads to internal instability in the state resulting in worsening situation of law and order. Third, the displacement of population, inward migration and internal competition of resources due to CC can result in the internal conflicts which would lead to insecurity and violence. Four, rising sea levels become a bigger challenge for islands or small lands as they will lose their land due to floods. This threatens the security and sovereignty of the state. Five, climate change brings the trans-boundary conflicts between states on water and other resources, for example the conflicts between India and Pakistan over water.

In response to these threat multipliers, there are also some threat minimizers which could mitigate the effects of climate change. These are: mitigation and adaptation, development in the economy, strong democracy, good governance, strong institutions, mutual cooperation,

proper time prediction and a need to increase the support for development in research programs on further understanding the relationship between CC and human security.

The UN Security Council has dedicated two sessions to the security threat posed by climate change. A recently published US Department of Defense Adaptation Roadmap states that “climate change poses an immediate threat to national security,” calling on the military to incorporate climate change into “broader strategic thinking about high-risk regions” (human security and climate change, 2016). The UN Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol contain no reference to human security (human security and climate change, 2016).

Rattan Lal in “Climate Change and Food Security in South Asia” discusses that CC is a major challenge in South Asia due to its impacts on increasing temperatures, precipitation levels, rising sea levels, melting glaciers and the degradation of natural resources (Lal, 2011). According to the Fifth Assessment Report of the IPCC (2013-14), migration due to climate change, resource competition and severe weather conditions result in increasing poverty and economic instability which gives power to violence and conflict both at the domestic and national level. Throughout the twenty-first century, the impacts of CC are considered to further reduce the economic development, more difficult to reduce the poverty, make the food insecurity more complex and increase the risk of human insecurity.

In his book, “Six Degrees: Our Future on a Hotter Planet”, Mark Lynas argued that “any crisis in food production could quickly escalate into a crisis for the whole Pakistan economy. Farmers across the country may find themselves outmatched in turn by big cities like Lahore, Hyderabad and Karachi, which each support populations in the millions” (Lynas, 2008). The scholars who have made efforts to find the ways to connect the climate change and the non-traditional security are Homer-Dixon and Myres. According to them, there are generally two assumptions: First, due to CC, instability can lead to social and political unrest and could result in “civil turmoil and outright violence” (Myres, 1989). Second, climate change could lead to internal as well as external insecurities. Increase in the patterns of extreme weather events due to CC would lead to economic and political instability which threatens the security. Therefore, it is obvious that the nexus between CC and human security has both implications on whole globe as well as South Asia particularly Pakistan.

Implications of Climate Change in Pakistan

Pakistan is facing serious consequences due to CC. Pakistan is very high on a vulnerability scale (Syed, 2016) and recent events have shown that Pakistan is vulnerable to all of these threats including frequent floods, killer heat waves in Karachi, earthquakes and freak tornado in Peshawar have shown that CC is the most serious threat to the human security of Pakistan. In 2015, severe heat wave killed nearly 1,500 people in Karachi, killed 49 people and great loss of property and lives in Peshawar due to severe tornado. CC affects the health sector in a negative way and is injurious in spreading the Dengue virus. In addition, due to an increase in global warming and rapid melting of glaciers, Pakistan has faced years of floods that have hit the rural economy drastically. Changes in weather patterns and frequent floods affect the productivity of the agricultural sector, have a negative impact on crops, heavy losses on the economy of the state and have a significant impact on the situation of food security. The situation regarding food security and agriculture has already been worse and climate change is making the situation harder.

Pakistan's climate change vulnerability and costs are real and rising. There are numerous factors that have made Pakistan a vulnerable state to climate change, such as geographic location, growing population, economic instability, unstable infrastructure, and bad governance. So it can't afford to take the matter for granted. The steps taken by the previous government on CC such as the Task Force and the Climate Change Core Committee have been considered effective in addressing the issue, but these steps are unfortunately inactive now. The current government is working on the National Climate Change Policy and its Frameworks, the Ministry of Climate Change is also taking the mitigating measures to help in reducing the emission of greenhouse gases.

Climate change is a constant process and a 'threat multiplier' for the national security of Pakistan as it has a very high risk and vulnerability to CC (Qurat-ul-Ain, 2017). Visible changes in the climate of Pakistan have been observed in recent years:

- Patterns of precipitation
- Droughts
- Periods of water availability
- Heat wave frequency and intensity
- Increased variability of monsoons
- Deforestation
- Natural disasters caused by weather – melting of glaciers, floods, etc.

Precipitation has increased by an average of 25 percent over Pakistan. Future annual precipitation, however, does not expect any significant change. CC increases the monsoon rain variability resulting in higher number and intensity of droughts and floods. There is a very little contribution to the greenhouse gases emissions in Pakistan but is considered one of the most vulnerable countries ("Environment and Climate Change Outlook", 2016).

Implications for Pakistan

Food Security

In the next three to four decades, the Himalayan and Karakorum glaciers will melt away, increasing in the flow of Indus River System ("Climate Change Mitigation and Adaptation Considerations For Hydropower Projects In The Indus Basin", 2016). It will then threaten the food and human security and will have a great impact on 95% of irrigatable land. Due to the massive heat wave and flooding, the crops are being destroyed and people are unable to find food in the far remote areas of Sindh and Punjab.

Public Health

Climate change induces extreme temperatures and events of rainfall can result in increasing diarrhea incidents and numerous viral diseases. Dengue fever has started to go viral in Karachi and Rawalpindi as a result of wastage and dirty water. There have been a total of 1,225 cases in the Sindh province in 2019 out of which 1,164 cases just in Karachi, which is a very alarming situation (News, 2019). Punjab has been fighting it well since then, while the situation in two other provinces is worrying. A substantial increase in diseases would result in heavy losses to bear.

Water Security

Pakistan's freshwater resources are extremely short and becoming a water stress country, leading towards water availability of less than 1000 cubic meters per year by 2035, as predicted in a World Bank Report. Pakistan's primary water sources are monsoons, western winds and inflows in the rivers from the Hindukush-Karakoram-Himalayas into the Indus River System due to melting of snow and glaciers. By 2030, agricultural production would be greatly affected due to water scarcity resulting in food insecurity and threatening the conflicts across borders. The government of Pakistan at first tried to make new dams for storage of water but all in vein.

Coastal Flooding

Due to rise in the sea levels, large-scale coastal flooding and recession of flat sandy beaches, salt water in the Indus Delta and mangrove risk, coral reefs and fish breeding grounds are expected. Due to increased tropical cyclone intensity, high risk to Karachi and other coastal areas of the Sindh-Makran coast, there is an increased risk to life and property in coastal areas. (Impact Forecasting , “Pakistan Flood Event Recap Report”, 2010).

Rising Sea Levels

There are the evidences of rise in sea level along the coast of Pakistan that would have the following consequences: (Annual report, “Environment and Climate Change Outlook”, 2016).

- Coastal region erosion
- Coastal flooding
- Delta flooding
- Aquifer and soil salinization
- Loss of habitat for animals, birds and plants

The instability in the effects of floods, rainfall, droughts and severe weather conditions may overcome a government or state's capacity for disaster-response / management. In recent decades, Pakistan has witnessed many floods and droughts. Due to poor mechanism and lack of political will to counter these problems, environmental problems in Pakistan are severe. In addition, the misuse of natural resources has made vulnerable changes in the environment of the country. Pakistan is prone to CC in monsoons, temperature changes and cyclones resulting in negative impacts such as devastating floods, droughts and rise in sea levels.

The changing global climate patterns have adverse effects on Pakistan such as water shortages, low agricultural yields, undermining the livestock, spreading epidemics and endangering the coastal areas which results in the increase of population migration. “The impact of rise in temperature would lead to a loss of one-fifth of the country's existing glaciers by 2030” (Markey, Climate Change and National Security: A Country Level Study, 2011). This huge and rapid decline in glaciers is expected to turn regional rivers into seasonal rivers. He draws attention to the increasing effects of CC in the form of water scarcity, damage caused due to coastal flooding and various other impacts.

By 2050, crop yields in South Asia are projected to be reduced by up to 30% and the availability of fresh water will be reduced by 12-20% due to climate change. Recently observed climatic variations such as increase in temperature, increase in monsoon and decrease in humidity,

indicate irregular weather pattern shifts. Similar changes in frequency and intensity are expected to increase, leading to severe weather issues such as floods, drought, and glacial recession. Dr. Qamar uz Zaman Chaudhry, author of the Pakistan National Climate Change Policy Project, points out that “rising extreme weather events in Pakistan over the past two decades, such as floods and droughts, are adverse effects and indications of climate change.”

Food and Water Insecurity

The economy of Pakistan is directly dependent on agriculture which includes 25% of its GDP, 2/3% of its employment, 80% of its exports and consumes a large proportion of water resources. Water shortage will further worsen the energy and food availability. With 240mm of annual rainfall and only 24% of arable land, overpopulated Pakistan would mostly become arid without its precariously dependent Indus water irrigation system.

Limited availability of water will lead to food and energy insecurity in Pakistan. Water shortages will undermine the Indus River System which is the backbone of the irrigation system of Pakistan, having the impact on crop yields and revenues such as wheat, cotton, and sugar (Raza, 2009). Decreased water availability will affect rice production and rise in temperature will decrease the duration of seasonal wheat growing making arid and semi-arid areas 90 percent less favorable for growth. It also emphasizes the insecurity of dismal energy in the presence of 162,000 megawatts of acute demand by 2030. Demonstrations due to food, blocking of roads, damaging the public property due to food shortage and rising prices and energy shortage prices have become the features of the so called policies in Pakistan.

Migration becomes a threat when the indigenous anticipate with new settlements a shortage of resources. Similarly, earlier inter-state migrations in the region have erupted into war due to the impact of politics and economics. India justifies the war with Pakistan in 1971 due to the massive influx of East Pakistan refugees. In summary, insecurity related to water results in the insecurity of food and energy and other challenges regarding environment like droughts and devastating floods can result in harsh conditions for livelihood and internal migration.

The major factor for the domestic and regional conflicts in South Asia is water sharing. It is an unresolved and disputed issue for Pakistan, India and Bangladesh in the region. Sharing of water is one of the most critical factor in the Kashmir issue because of the important water resources in Kashmir which pose serious implications for the agriculture of Pakistan. These countries have fears for each other about the system of water. Pakistan has strong reservations

about the Tulbal navigation project of India that is Wullar Barrage, Kishenganga Dam and Baglihar Dam of Pakistan (Swain, 2004).

India also objected to the Diamer-Bhasha dam in Pakistan. Water sharing is not only the issue between states but also the issue within the states like between Punjab and Sindh of Pakistan and Punjab, Haryana and Rajasthan of India. Punjab is considered as the main province with major water resources in Pakistan which hinders all the efforts required for making the large dams important to store water and fulfilling the demands related to energy. CC affects the availability of water for future which can turn into conflict and a war between states or internal conflicts between the provinces and political instability particularly in the absence of a democratic government.

Policy Recommendations at the National Level

National Level

Four major areas are need to be worked on to achieve effective adaptation, mitigation and disaster management. It is a priority to raise awareness, organizational and institutional adjustments, build capacity, and develop infrastructure.

1. Awareness

To put light on the threats related to CC and its implications, immediate action is required to raise awareness through targeted media and advertising campaigns. Local communities can be trained and mobilized to adequately prepare for disasters. It would require local government and NGOs to cooperate in raising awareness, especially among farming communities and in poor urban areas. The government has taken awareness steps by launching campaigns like Clean and Green Pakistan, Plastic Free Pakistan and 10 Billion Tree Tsunami Program. These should be implemented by each one of us.

2. Organizational and Institutional Initiatives

By strengthening the Climate Change Division and making it more efficient and accountable, organizational and institutional initiatives at the national level can be undertaken in the short term. This will also help the Division to decentralize, giving it greater freedom to fulfill assigned tasks.

3. Capacity Building

Climate change related institutions need to address human resource requirements for numerical modeling and fundamentals of the climate system. Government should

ensure that universities offer courses on climate system patterns and relevant sciences at graduate and post graduate level. In addition, it is necessary to improve the irrigation system by introducing large amount of sprinkler and drip irrigation. This requires adequate funding. The use of modern and more efficient irrigation systems must therefore be encouraged by government policies.

4. Infrastructural Development

Diamer-Bhasha, Akhori, Munda and Kalabagh dams are essential for floods, droughts and sea intrusion mitigation at the federal level as we have much less capacity in our country. These dams will provide regulated flow through the Indus deltaic area to overcome sea intrusion and help in preserving the ecology and saving local people's livelihoods. To ensure effective implementation, provincial and local governments need to be mobilized. Provincial and district rain water harvesting is needed to counter water scarcity and sub-surface water charging. Government should encourage the use of solar energy by households and small businesses and integrate excess generation with the national grid.

Conclusion

To sum up, it becomes obvious from the facts and figures that climate change imposes great and negative implications on the human security in Pakistan which directly impacts the national security of the state. Some policies and steps have been taken to reduce the impacts of CC but they are not the final solutions to that. The government must take solid policy measures to ensure the security and sovereignty of the state. It is the dire need of the hour to control the menace of climate change which has threatened the human security and lives of the people of Pakistan.

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Pakistan-China Military and Security Ties

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Abstract

After China's emergence as a global power, military modernization, strengthening military ties with other states in different regions of the world, and enhancement in arms exports are some of China's objectives to achieve. This research paper focuses on analyzing China and Pakistan's cooperation in defense sector as it is one of the leading elements of Pakistan-China strategic relations. This paper analyzes the Pakistan-China defense cooperation in all three branches (Army, Air Force, and Navy). This research study has employed the qualitative method in which secondary sources of data have taken from existing literature, published and unpublished research works and primary data was collected by conducting interviews of International Relations experts' to analyze China's defence and security cooperation with Pakistan. The outcome of discussion reflects that in the post 9/11 period, Pakistan and China have strengthened their military and security ties.

Key Words: China-Pakistan Strategic Partnership, China, Defence, Pakistan, Security

Introduction

In the 21st century, Pakistan-China bilateral partnership has risen to the highest level, and they consider themselves as “All-weather strategic partners.” The Chinese government has consolidated its defense ties with Pakistan by developing multidimensional military technology, development of Gwadar port, joint military and naval exercises, the joint production of fighter jets, and cooperation in the nuclear sphere.

In the year of 2014, China exported military weapons worth \$394 million to Pakistan. In the very next year, this export was increased by 70 percent, and China supplied arms to Pakistan worth \$565 million. It is noteworthy that the US decreased its arms sale to Pakistan from \$189 million in 2014 to \$66 million in 2015 (Tribune, 2016). In its study on the world arms trade from 2011 to 2015, According to Stockholm International Peace Research Institute (SIPRI), in the period of 2013-2017, Pakistan is the largest buyer of these arms with 35 percent of China’s arms exports among 48 recipient countries. (Pubby, 2019). Pakistan has been the biggest importer of Chinese arms sales for all five-year periods since 1991 (pieter d. wezeman, March 2018). Chinese troops Special Service Group visited Pakistan in December 2018 to participate in sixth joint exercise which is an important element of China-Pakistan defense and military cooperation (Pubby, 2019) Sino Pak defense and security ties are enduring and highly thriving. This strong partnership is exceptional and strategic interdependence between the two countries and convergence of interests have further given a boost to this existing relationship that has developed over the last sixty years. Along with many significant factors that have been discussed in the earlier part of the chapter, initially the India-Pakistan’s 65 and 71 wars and China’s border conflict with India in 1962 laid the foundation for China-Pakistan security relations. Many Chinese scholars used the term “common strategy” Pakistan-China strategic relations especially after 1965 and 1971 wars, but particularly in the latter half of 1970s. The Soviet Union invasion in Afghanistan made Pakistan-China strategic relations stronger. (Singh & Sciences, 2007).

After 9/11, due to various developments and emergence of new threats, China and Pakistan are consolidating their collaboration in regional and national security matters. China has assured Pakistan that it will continue to support Pakistan in every possible manner. There are frequent political and military high level visits from both countries in past few years. Qamar Javed Bajwa

visited China in 2018 after his appointment as Chief of army staff of Pakistan where he met with Chinese military and political officials. He discussed regional security, economy, defense and other agendas of common interests. After the meeting, Chinese media reported that China has plans to strengthen military ties with Pakistan by developing ballistic missiles, cruise and multi-role combat crafts. According to a Chinese military expert Song Zhongping, “China’s authorization to Pakistan to produce ballistic missiles, cruise missiles, anti-aircraft missiles, anti-ship missiles and main battle tanks in Pakistan is on the agenda.” (T. E. Times, 2018)

The most significant visit was made by Prime Minister Imran Khan in November 2018 when both countries pledged to strengthen their defense and security ties. In this visit, China and Pakistan agreed to enhance military cooperation between two countries and continue their joint efforts to counter terrorism, extremism and separatism. Both sides believe that these joint efforts are required for stable security environment. According to security analysts, Pakistan is replacing its western suppliers with China as its main defense supplier due to China’s low prices and loose financial terms because Pakistan is a cost conscious customer because of its economic challenges (F. Times, 2016).

In a personal interview, Brigadier (Retired) Naeem Saalik and Salma Malik agreed on this point that China is the only country who is willing to transfer the technology to Pakistan in recent times at cost effective price as Pakistan is facing resistance for getting F-16 fighter planes from US while other options require hard cash. So buying from China is cost effective for the country like Pakistan who is facing security and economic challenges. Brig. (Retired) Naeem Saalik said: “One important factor is that this inequitable system based on political considerations in which some countries are given access to advance technologies where as countries like Pakistan are denied access to advance technology .We have seen in the past that when United States congress completed rejected to finance the deal of giving eight F16 to Pakistan which Pakistan is still trying to get, so if you have to buy cutting edge technologies from other sources, that one is very costly ,for instance if you get it from France, they will ask for hard cash which Pakistan Does not have, US had political strings attached to this deal as they forced Pakistan to act against Haqqani Network and Pakistan rejected those conditions So, China is now the major provider of the defense equipment to Pakistan , China is exporting to other countries as well but Pakistan is the largest client. China is one country that this is a reliable source of supply and is the only country who is willing to transfer all the technology to Pakistan as we have seen in the case of joint development JF17 Thunder, we have

seen this cooperation in terms of tanks, missiles, so they are willing to transfer sophisticated technology, Pakistan and China have entered into submarine deal some of those will be manufactured and assembled in Karachi. Chinese technology is still affordable for the country like Pakistan and they are also willing to provide loans on soft terms. We need to enhance our capabilities because India is getting sophisticated and up to date technology from all major arms exporters”(Saalik, Personal Communication November 12, 2018).

As there are serious security threats to Pakistan from Afghanistan and Indian fronts so it needs to enhance its defense capabilities. Initially America was the main arms provider to Pakistan but with the ups and down in this relationship, Pakistan understood this point that it needs to diversity its relations for its defense needs and China became a continuous source of support for Pakistan. As India is getting defense support from all the major powers and Pakistan is denied to all the new and sophisticated technologies, China is the only country which is ready to enhance Pakistan's defense capabilities and it is cost effective too as Pakistan is unable to afford expensive arms due to its economic crisis.

Salma Malik has mentioned the same reasons for Pakistan's reliance on China. She said, “For Pakistan the access to Chinese technology or cost effective Chinese technology, I would not call cheaper because that gives a different message, cost effective technology has been very beneficial because of Pakistan's limited purchase capacity. The second aspect is that the China and Pakistan are geographically very close to each other so having assembly lines, collaborations and the proximity also helps in a certain passion. It is also need base thing that China is willing to relax a lot of things when it comes to defense collaboration. And that is something which is always beneficial for a country like Pakistan as it was struggling to attain good technology at a cost effective price and that is something that China has done to Pakistan”.(Malik, Personal Communication November 19, 2018) China has as always and traditionally provided Pakistan with intermediate range weaponry, small weapons and light arms, helped in establishing the Heavy Industries Taxila (HIT), the KAMRA heavier aeronautic complex and so many other things speak for itself plus the fact that the type of purchases Pakistan had made in the past when they required refurbishing, going to the western countries and getting extremely expensive spare parts, all was very difficult for cash a challenged Pakistan. So for Pakistan, having great cooperation with China in defense sector is a great source of strength and China got very strong consistent customer in form of Pakistan so that is something which really works for them.

U.S was the biggest seller of defence supplies to Pakistan but current equation between US and Pakistan has been changed. U.S has accused Pakistan repeatedly for harbouring militant groups like Haqqani Network and Afghan Taliban. US suspended coalition support fund and military training programs for Pakistani military officials despite of fighting a war for Americans at a very high cost of military personals, civilian lives and it has also affected the economy.

Dr Muhammad Khan expressed his views regarding US's allegations on Pakistan and suspending support fund as: "It is a tactic that US is using to pressurize Pakistan to do more. As Pakistan said that it is no more dependent on US and relationship should be based on equality and mutual interests. Pakistan is fighting against the terrorism and US is still accusing Pakistan that they are providing safe heavens to the terrorists and it is a known fact that Pakistan has provided evidence to US and UN and India that Afghanistan soil has been used against Pakistan and Pakistan is fighting against these non state actors by launching military operations Zarb-e- Azab and Radd-ul-Fasaad. Pakistan has told the international community that terrorists are terrorists. Pakistan has no favorites. Haqqani has been killed in Afghanistan and their network is operating from Afghanistan. Whatever USA has given us it is because we were fighting on their behalf. But if we look at China, China is also supporting us because of its own interests. National Interests come first. China is not doing anything extra. They have their stake in Pakistan and if we take a look at history, Pak did more extra for China than China did for Pakistan."(D. M. Khan, Personal Communication October 23, 2018). The US suspension of coalition funds and training programs for Pakistan is not the first time. They have used this tactic several times in the past to pressurize Pakistan to act accordingly to their desires. The current situation is quite different from the past as Pakistan has learnt from its past mistakes and now it relies more on China for its economic and defense needs than US. Pakistan has made it very clear under the new government that the relationship between US and Pakistan will be based on mutual interests and respect. China has its own interests as well as every state has its own interests when it comes to partnerships and relationship in international politics. If we analyze the whole situation, Pakistan is more significant for China than China for Pakistan due to China's regional and global agendas which it needs to achieve.

In a personal interview with former Ambassador of Pakistan to United Nations and Executive Director of Centre for International Strategic Studies, Ali Sarwar Naqvi argue that growing mistrust in Pakistan-US relations is also one of the factor that is pushing Pakistan more towards

China for defence supplies. Riffat Hussain and Imtiaz Gul expressed similar views. Ali Sarwar Naqvi said: “Since the US was the bigger defense supplier to Pakistan and as Pakistan fully understand now that Pakistan cannot fully depend on US anymore because there have been some sanctions by the US and there have been interruptions, there are certain suspensions on their programs , so in that scenario yes Pakistan does turn towards china more than it used to before.”(Naqvi, Personal Communication November 14, 2018)

Dr Riffat Hussain argued: “The two developments that I had in mind among others are first of all there is mark deterioration in U.S. Pak ties. And that’s quite evident from Trump’s South Asian strategy in which they have singled out Pakistan as the main hurdle in America’s desire to pull back from Afghanistan. In fact they have accused Pakistan of promoting terrorism and the second indication of that is American action for example they have suspended coalition support fund to Pakistan and secondly they have decided not to provide any further defense assistance to Pakistan so this aid cut off to Pakistan along with the American closing up to India is a clear indication to Pakistan that U.S is no longer available to Pakistan as a strategic partner to them which to Americans used to be ever since the period of cold war. As a result of these two developments the Pakistanis have decided to firmly move to consolidate their security relationship with China.”(Husain, Personal Communication November 6, 2018)

In the view of Imtiaz Gul; “Pakistan has moved away from US and Pakistan has embraced china as a strategic partner based on the lessons of past seventeen year because all Pakistan has got in last seventeen years putting after the unfolding of war on terror is condemnation, criticism and this blame of double game etc so gradually Pakistan has realized that looking up to the United States wouldn’t helped particularly because after the 2006,2007 nuclear cooperation deal between India and united states so I think Pakistan has been consciously chosen to tilt towards china for not only for security but also for strategic framework.”(Gul, Personal Communication October 29, 2018)

In a personal interview with Ghulam Ali, Farhan Siddiqi, Manzoor Afridi, Brig. (Retired) Naeem Saalik and Salma Malik, they all mentioned the same point that initially Pakistani military was getting American technology while the present rift between US and Pakistan forced Pakistan to look for other options not only toward China but also Russia. Ghulam Ali said, “Yes Pakistan’s current equation with US has forced Pakistan to look towards China more because we are dependent economically and militarily on foreign sources since our independence so when

Pakistan's resources are cut down by one source it certainly pushes Pakistan more towards China.” (D. G. Ali, Personal Communication January 12, 2019)

In the view of Farhan Siddiqi, “The more of Pakistan's relationship with United States of America is based on friction which is one of the reasons that push Pakistan towards China more”. (Siddiqi, Personal Communication December 27, 2018) According to Manzoor Afridi, “Recent US policies towards Pakistan are the repetition of its policies, when John Kennedy came in 1961 and cut the military assistance, then Pakistan became closer to China. Pakistan and China signed big agreements for which USA was not happy then. And even after that in 1965 war with India, USA imposed economic and military sanctions on Pakistan. So that's why Pak got much closer to China. In recent times, same thing has repeated as Trump administration has suspended coalition support fund and military trainings so without any doubt Pak gets closer to China in getting any military assistance, military training and military hardware and one more imp thing is that Pakistan is also getting closer to Russia. And the Russian troops have come to Pakistan for joint military exercises. So Pakistan is not only getting closer to China but also looking for further options like Russia.”(Afridi, Personal Communication October 24, 2018) Brig. (Retired) Naeem Saalik said, “It is very obvious because when one runs out of choices then whatever the option is available to you, you go for that that is why Pakistan along with China, is trying to open up to the Russians.”(Saalik, Personal Communication November 12, 2018)

According to Dr Salma, “Pakistan has very strong and solid defense needs because of the extremism and rise in terrorism especially in post 9/11 era, and whatever was provided by US, it was because Pakistan was fighting its war at the very high cost and US now is no longer there as a party with Pakistan side rather it is adding to the tensions in the region and this is making the case between Pakistan and China stronger than it was ever before.”(Malik, Personal Communication November 19, 2018). According to Former foreign Secretary Riaz Muhammad Khan, Pakistan's defense relations with China do not affect by Pakistan's equation with America as they are always remain steady. China–Pakistan military cooperation is steady and remains unaffected by other factors including ups and down in our relations with the US. America suspended our reimbursements under Coalition Support Fund (CSF) for our deployment of forces in US led war on terror which was an agreement between the two sides in 2002. The suspension could affect somewhat Pakistan's capacity to fight terrorism and extremism which in any event Pakistan needs to continue in its own interest. In fact CSF was a bad arrangement from Pakistan's

point of view. While we agreed to get reimbursements for our deployment, Pakistan allowed free of charge the use of ALOCs and GLOCs (Air Logistics Communications and Ground Logistics Communications) as well as the use of three air bases. As far as suspension of training is concerned, this is a controversial step even within the US establishment, because many American officials believe that the arrangement generated goodwill among personnel of the two militaries and that a similar suspension earlier in the 1990s was harmful from the US point of view.”(R. M. Khan, Personal Communication January 16, 2019)

Most of the scholars in Pakistan believe that the money Pakistan was getting from America was not enough and Pakistan has spent a lot more than these reimbursements and have given more support to American and NATO forces than any other country. Pakistan’s relations with US do not affect Pakistan-China strategic partnership due to China’s consistent policies towards has Pakistan.

Aizaz Ahmad Chaudhry said: “In military aspects China is Pakistan’s largest supplier of defense equipment. Pakistani military services (army, navy and air force) train closely with Chinese military forces. Pakistan’s military relationship with China was already close, by the time U.S. cut military aids, suspended training programs and denied f16 supplies in recent years.”(Chaudhry, Personal Communication December 3, 2018) Initially, Pakistan and China came closer because both countries wanted to counter India’s hegemony in the region because of their territorial conflicts with India. Some scholars called Pakistan-China relations an Indian Centric relationship. Later on and especially in post 9/11 era, new dimensions have been added to this bilateral cooperation due to the changing scenarios and most importantly due to rise in terrorism and extremism in the region. China’s strong defense cooperation with Pakistan serves China’s interests in South Asia which include peaceful security environment in Pakistan and Afghanistan, curtail the influence of militants and separatists, securing energy and trade routes.

According to Manzoor Afridi, China’s defense cooperation with Pakistan is not just because of the fact that China wants to make Pakistan stronger but also it serves China’s own strategic interests in South Asia (Afridi, Personal Communication October 24, 2018). There are number of objectives which China wants to achieve and Pakistan is a reliable partner to achieve its goals. Firstly, China is directly threatened by Uighur separatists in its western province Xinjiang and strongly feels that these Uighur Muslims have direct links the militants who are operating from Pakistan and Afghanistan’s soil. So China feels that Pakistan can curtail terrorism. Pakistan has made an every

possibly effort to avert the use of Pakistan's soil against China in any manner. Many religious organizations which alleged to have connections with militants in Xinjiang (western part of China) were banned by the Pakistani government. Pakistan also caught many Uighur separatists and they were given to China. All the political parties in Pakistan were agreed over the issue of not to support any terrorist group in China. To fight against terrorism, Pakistani armed forces entered in tribal areas of Pakistan to destroy militants' hideouts and these efforts were acknowledged by Chinese government at various International platforms. Secondly, instability in Pakistan and Afghanistan poses serious threats to China's grand economic and strategic ambitions. In the past several years, many agreements for various development projects were signed by both countries but security issues within Pakistan were not satisfactory for the Chinese workers so the progress on these projects remained slow. Pakistan's law enforcement forces have made a lot of efforts to make internal security situation better so the working environment could be peaceful and secure foreign workers and investors. Thirdly, if there would be a peaceful and secure environment in this region, China's strategic interests would be served. China's main focus is to enhance cooperation among regional states to fight against nontraditional security threats. In 2004, China mediated India-Pakistan peace talks because it knew that cooperation among regional states is must in a struggle against emerging non-traditional security threats and this could not be possible until India and Pakistan would not cooperate to resolve their bilateral issues. Therefore, to formulate a strong and joint comprehensive strategy to fight against non-traditional security threats has also given a new direction to Pakistan-China's existing security cooperation.

During Cold war, both countries established their defense ties and since then, China is the most reliable defense partner of Pakistan. From 1960 to 1980, Pakistan got one third of its arms supplies from China. This was more than what US and other countries supplies to Pakistan. China continued exporting arms to Pakistan even in the post cold war era when arms transfers were in decline. Until mid-2010, according to a defense source, Pakistan received almost 70 percent of its military aircrafts and battle tanks which includes 36 ballistic missiles (1992), 1600 Main Battle Tanks (MBT), 400 fighter aircrafts and 40 naval ships from China (Defence, 24 August, 2010).

During 1980's and 1990's US and western countries imposed economic and military sanctions on Pakistan and at that time China really helped Pakistan in terms of fulfilling its defense needs by supplying defense supplies, small weapons and technical assistance. (Siddique, 2014) Along with the joint production of JF 17 Thunder, there are number of important projects which include Al

Khalid Tank (Main Battle Tank), K-8 training aircraft, F-22P frigates, naval warships, F-85 Tanks and production assistance for JF 17 (Gady, April 28, 2015). Western countries believed that China has also developed a manufacturing compound for building “turnkey ballistic missile” in Rawalpindi, a city of Pakistan closer to its Capital. In addition, China helped Pakistan by providing assistance in developing Shaheen-I ballistic missile which is a 750KM range missile (Hussain & M Heritiana, 2015). Furthermore, China and Pakistan are committed on new joint projects and work closely to consolidate defense collaboration (Z. A. Khan & Ahmad, 2015).

Defense Cooperation between Ground Forces

Pakistan and China enjoy closer defense ties as this relationship serves interests of both countries. The salient features of Sino-Pak defense cooperation are:

- i. Pakistan always enjoys China’s support in terms of weapons and technology and fulfills its defense needs especially at times when it faced military sanctions from major power (U.S and western countries) during Indo-Pak wars.
- ii. Beijing’s main objective of providing military weapons is not just to make Pakistan more dependent on China, but also to make it stronger and self-reliant. Hence such assistance helped in establishing Pakistan’s own Heavy Industries Taxila for the production of arms and ammunition, spare parts, license production and joint production of fighter aircrafts for enhancing its military capabilities.
- iii. Pakistan’s defense sector was strengthened by China’s continued arms sale and it helped Pakistan in improving its defense posture. China’s continuous support in defense sector instigated other defense suppliers to sell their defense technology to Pakistan.
- iv. There is a trust factor involved in Pakistan-China relations particularly in military terms because it has been very smooth since the beginning. Both countries prefer to keep all the details related to agreements only between the two and reveal the details only when expedient.
- v. As Pakistan does not have domestic, technological, scientific and financial capabilities, defense collaboration with China is more beneficial for Pakistan (Munir, 2018).

Geo- strategic Alliances are one of the important features in global politics and security system; as a result it has made this partnership an important one. China has been a very reliable partner in terms of military as well as political support to Pakistan since 1962. Pakistan's army was supported by China in building arms and ammunition industries, modernizing existing defense facilities and providing technological assistance (Jamal Afridi, July 6, 2010). A border settlement agreement was signed by two countries on 3rd of March, 1963; a great step towards establishing close ties and a first step that was taken by both countries against Indian interests (Akhtar, 2014). With the passage of time, due to mutual interests and objectives, China-Pakistan became reliable partners. For China, Pakistan was a reliable buyer for its low quality weapons, comparatively to western and American technologies. Due to its close partnership with Pakistan, China attained an access to American and Western military weapons and technologies which Pakistan bought from them. For China, Pakistan was also a strong ally against India. In return of all these benefits, China provided Pakistan low cost yet effective and extensive military technologies and support. The first and foremost important step in military cooperation was taken by both countries soon after 1965 India-Pakistan war. Pakistan received support from China against India as China set its own forces on high alert on Indo-China border and threatened India of calamitous consequences (McGarr, 2013). Pakistan and China consolidate their defense in the wake of new developments and security challenges in the region and they are committed to further strengthen defense ties as it serves mutual interests of both countries. The two counterparts conducted a formal meeting at Joint Staff Headquarter Chaklala on June 22, 2011. Both countries emphasized to enhance mutual cooperation in various field of defense, training programs, countering extremism and terrorism, technology transfer, joint military exercises and acquiring military equipment and defense supplies. In this meeting, China and Pakistan signed two important agreements to consolidate the strategic partnership between two countries (Munir, 2018).

Chang Wanquan, the Chinese Defense Minister, visited Pakistan to meet Pakistan's high military and political officials. During his visit, Chang met the Prime Minister Nawaz Sharif, Defense Minister Khawaja Asif, Chief of army staff Gen. Raheel Sharif in February 2014 (Dawn, Februaray 28, 2014). In his meeting, he assured Pakistani officials that China is committed to further strengthen a defense and security relation which is a significant step towards regional peace. In addition to these meetings, defense delegation from both countries arranged a joint session to discuss joint production programs and China assistance to Pakistan in attaining self-sufficiency in

defense production. Different issues related to naval support, joint military exercises and defense cooperation were also discussed. (M. U.-H. Khan, 2014) Both countries are determined to strengthen their strategic cooperation by initiating several joint projects and joint military exercises.

Air Defense Cooperation

China and Pakistan's cooperation in air defense is commendable. Establishment of Pakistan Aeronautical Complex (PAC) for assembling and production of fighter and trainer aircrafts by both countries is remarkable example of great relationship between two countries. Pakistan acquired assistance from China to build PAC for rejuvenation of air planes in Pakistan Air Force fleet which includes Henyang F-6 (now retired), Nanchang A-5, F-7 fighter aircraft, and Shenyang FT-5, FT-6 Jet trainer aircraft (Munir, 2018). For the production of ground-based radar systems, avionics and electronics, Kamra Avionics and Radar Factory (KARF) also present in Pakistan Aeronautical Complex which is the third biggest assembling plant in the world.

For broadening its working capacity, PAC began production of aircrafts by building an industry (Aircraft Manufacturing Factory) in 1980. The Aircraft Manufacturing Factory got appreciation at regional level as it manufactured K-8 advanced trainer aircraft in collaboration with China's Hongdu Aviation Industry Group. China and Pakistan manufactured JF-17 thunder, a combat aircraft at Aircraft Manufacturing Factory jointly ("JF-17 Aircraft,"). The AMF collaborated with China's Chengdu Aircraft Industry (CAI) for JF-17 Thunder production. ("JF-17 Aircraft,")

In the fields of research and development, nuclear weapons and aerospace technologies, Pakistan was assisted by China. Pakistan further acquired assistance from China in various fields such as joint production of combat aircrafts, building aircraft industries, engine designs and production of air jets. Various electronics warfare, radar and unmanned platforms were also supplied by China to Pakistan. China assured Pakistan that it would continue its cooperation. Along with JF-17 Thunder, joint production projects include; Karakoram-8 Trainer and Fighter aircraft, Super-7 Fighter (a substitute for existent F-6 fighter aircraft) and J-10 Fighter. J-10 is the most sophisticated fighter jet owned by Chinese as China gets 70 percent of its arms exports from j-10 sales. Pakistan was the first country with whom China shared this technology by giving 36 J-10 B to Pakistan. Lt. Gen. Waheed Arshad, Pakistan's Army Chief of General Staff, visited China and Chinese officials

promised Pakistan to strengthen defense relations by giving a squadron of J10-B advanced, all-weather, multi-role aircrafts. Pakistan Air force also has Karakoram Eagle which is a Chinese-built Airborne and Warning System. It can identify airborne and sea-surface enemy targets, prior to ground-based radar detection regardless of the height.

Pakistan also acquires assistance from China in space technology. Both countries are strengthening their collaboration in research and Development programs for information gathering from Space (G. Ali, September 09, 2011). Space agency of Pakistan SUPARCO (Space and Upper Atmosphere Research Commission) and China Great Wall Industry signed an agreement for the replacement of PAKSAT-1; Pakistan's communication satellite in October 2008 in Beijing (Dawn, October 30, 2010). Pakistan's Prime Minister Yousaf Raza Gilani visited China in October 2009 and signed an agreement with China regarding satellite's ground control system (Nation, October 11, 2009). In June 2010, an agreement was signed to finance a significant project Framework Loan Agreement according to which, China will provide RMB 86.5 million loan on concessional basis to start work on ground control system (Nation, October 11, 2009). China and Pakistan's defense forces have already corroborated the project. Pakistani and Chinese experts from all three forces (ground, air and Naval) took part in the initial Research and Development phases and the on-ground initiation of the project (Masood, October 10, 2010).

China-Pakistan Naval Cooperation

In September 1971, Muzaffar Hassan, Commander-in-Chief of Pakistan Navy visited China along with his delegation. Both countries began a formal naval cooperation as it was the first and significant visit to China by a Pakistan Naval Chief (Kane, 2016). During his visit, he held significant meetings with Chairman Mao Zedong and Premier Zhou Enlai. At that time, Pakistan was facing internal crisis in East Pakistan. A great security concern regarding situation in Pakistan was expressed by Zhou Enlai. He was in the view that if there would these tensions would increase; it could affect the security of entire region including China. He directed navy commander in chief to provide naval supplies and assistance to Pakistan in this hour of need. Pakistan needed to counter instability and turmoil in East-Pakistan. For this purpose, without any pre conditions over price or payment schedule, China agreed small petrol ships but these ships were delivered to Pakistan after the separation of East Pakistan due to repercussions of 1971 Indo-Pak war.

China and Pakistan started looking for the possibility of arms sale and transfer of technology of F22 frigates in 1985 (Dawn, April 07, 2005). Pakistani government approved an amount of \$700-800 million to purchase four Chinese origin Jiangwei-II frigates ships in 1992 (Defence, August 01, 2009). In addition, Pakistan ratified an agreement with China for acquiring four F-22P frigates (Dawn, April 07, 2005). The detail of China-Pakistan Naval cooperation during 1990-2006 is given hereunder. Both China and Pakistan are determined to enhance this collaboration in developing eight F-22P warships (Munir, 2018) and utilizing the skills of experts from Hudong Zhonghua shipyard (Shanghai) and KSEW. The total cost of building these eight vessels is around US\$ 1.4 billion (Niazi, December 16, 2009).

China is also manufacturing the most advanced naval frigate for Pakistan. It is reported that these advance frigates would be equipped with capabilities such as anti-ship, anti-submarine & air-defense operations. The vessel's class is Type 054AP, which means, it is based on the Type 054A of the People's Liberation Army (PLA) Navy (News, 2019). According to an expert in China's shipbuilding sector, this ship is the largest and strongest combating warship China has ever exported. He stated; "Based on pictures circulating on the internet, the ship will have vertical launch cells that can fire Chinese HQ-16 air-defense missiles and other kinds of missiles. Vertical launch cells will bring flexibility to the user in terms of weapons portfolio, thus giving it a stronger fighting capability." (News, 2019) Once the construction would be completed, the vessel will be one of the biggest and technologically advanced additions to Pakistani Navy fleet and make the capabilities of Navy stronger to take action effectively against future security challenges, maintain regional peace and stability and maintain balance of Power in the Indian Ocean region.

Nuclear Cooperation

China supported Pakistan's nuclear program since the beginning, at the initial stage, it faced equipment and necessary material shortage due to export restrictions from the West. According to few global security experts, China helped Pakistan in acquiring 'Nuclear State' status and presently it is estimated that Pakistan has 110 to 130 nukes in its strategic arsenal (DeYoung, January 31, 2011). For the development of nuclear infrastructure, Pakistan received assistance from China in terms of nuclear facilities and expertise. As a result, Pakistan was successful in establishing its first plutonium producing nuclear reactor at Khushab ("Federation of American Scientists (FAS) A Brief History of Pakistan's Nuclear Program,").

For the amplification of Uranium enrichment facility, China's National Nuclear Corporation provided Pakistan 5.000 ring magnets- a high speed rotational component of centrifuge. China continued its support for Pakistan and provided extensive technical and material assistance for the development of Chashma Nuclear Power Complex and plutonium-reprocessing facility in mid 1990's. ("Federation of American Scientists (FAS) A Brief History of Pakistan's Nuclear Program,") On 15th October, 2008, an agreement was signed for building Chashma-3 and Chashma-4 nuclear power plants (NTI, 2011). For the validation of agreement, on 31st March 2010 the Pakistan Atomic Energy Commission (PAEC) signed an agreement with two Chinese companies; Zhongyuan Engineering Corporation (ZEC) and China National Nuclear Corporation (NTI, 2011) On 30th September 2009, an agreement on fuel supply (NTI, 2011) was signed. Sindh Environmental Protection Agency approved the proposal of building K-2 and k-3 in 2015 (nuclear reactors) in the west of Karachi which would add 2200 MW of power in national energy grid (Technology). Pakistan is the first importer of China's ACP 1000 technology which China is building in Fujian province. In order to take more orders from other countries, China is keen to show the safety and efficiency of its cost cutting technology. China has been providing loans on softer term for this technology to Pakistan. As Pakistan is facing serious issue of power shortage, China is giving an affordable solution in the form of its latest Hualong-1 reactor technology (Malik, Personal Communication November 19, 2018).

Conclusion

The discussion presented in this research paper shows that since the beginning of the 21st century, China and Pakistan have been enhancing their defense cooperation and have initiated various joint defense projects such as fighter planes JF 17 Thunder and 22P-Frigates. China recognizes the fact that Pakistan owns the high-tech defense production industry, and vast human capital resources are available, so China is keen to invest in joint defense production. China and Pakistan expect to export their defense equipment to Middle Eastern states, Asia and Africa in near future. Pakistan and China are determined to enhance aviation and naval cooperation. The current regional security environment and the emergence of non-traditional threats compelled both countries to strengthen defense cooperation.

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Peace Building through Religious Tourism in Pakistan: A Case Study of Kartarpur Corridor

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Abstract

Pakistan is an Islamic democratic country where all the minorities as well as tourist from all over the world can practice according to their belief freely. Pakistan has many religious sites of shrines and temples. Gurnanak Sahib stayed his last eighteen years of his life at Kartarpur, Narowal, Punjab, Pakistan. His grave is located in Pakistan, just 3 km from the border with India. Sikh see this grave through a telescope across the Indian border of popular religious thought. The Government of Pakistan addresses the problems of the Sikh community, and the Kartarpur corridor in the Sikh community is innovative for the entire Sikh community. These Sikh communities can visit the holy saints of Kartarpur without a visa. Fortunately, the first recommendation from Pakistan allowed us to see the whole event religiously. This step is not only appreciated by the Sikh community. Therefore, Pakistan is a peaceful country and treats other religions as an Islamic state. Every year including Muslims visitors from different countries come to Pakistan for holy shrines like Hindus, Sikhs and Buddhist and Christians.

Today, world started to acknowledge Pakistan's efforts towards achieving peace in the country. This is why Pakistan is listed among the top tourist destinations by top foreign travel magazines. Though, the findings of the study expose that Kartarpur: A religious place of Sikhism in Pakistan will play a vital role in the peace building image and economic sector through increased international tourist arrivals.

Keywords: Religious, peace building, tourism, kartarpur, Sikhism.

You are free; you are free to go to your temples, you are free to go to your mosques or to any other place of worship in this State of Pakistan. You may belong to any religion or caste..... “We are starting in the days where there is no discrimination, no distinction between one community and another, no discrimination between one caste and creed and another. We are starting with this fundamental principle that we are all citizens and equal citizens of one State”.

(Quaid e Azam Muhammad Ali Jinah)

Religion

Today, in changing global political landscape, religion is a significant component as a social measure with the complication of the erections and purposes that irritated values and customs. So, it is strong and clear that if there is no sole or simple classification of a complex idea of faith, it is a system of recognized theories and performs that recognize the strength of human beings, allowing people to solve life's problems and not go further. (Raj & Griffin Eds., 2015).

Tourism is experiencing significant economic and social growth. Today, all religions confuse the distinction between religious pilgrims and secular tourists.(Aziz, 1995; Wahab, 1996).

The foundation is unclear and is linked in different ways to religious pilgrimages, major journeys and other important movements of people from their usual residence to another destination.(Lavery, 1987; Holloway, 1989; Towner, 1994) In many countries, tourism is a primary source of earning and we are beginning to tap into this industry.(Arab News, 2019)

Religious tourism

These are mainly those on the other side of the pilgrimage, who travel consciously for meaning for reasons related to religion or spirituality. It is religious tourism, regardless of the reasons, objectives and scope of their experiences. These religious or spiritual travelers are regarded as a separate group in traditional tourism research, because the search for what Edison considers a "bunk bed" is at best a vague concept of "religious meaning." I tend to. He is only a human nature who expresses himself fully, asking the final question and seeking the final meaning of existence in all its hidden aspects and implications. (Giussani, 1997).

Despite such intangibility, pilgrimage has long been an important aspect of the major world religions. Much of the Old Testament is a journey by the Jewish ‘chosen people’, beginning with

their exodus from Egypt, journeying through the desert and entering the Promised Land. Three times a year the Israelites made pilgrimage to the holy city of Jerusalem. Mohamed, inspired by Jewish (and subsequent Christian) pilgrimage, commanded Muslims: 'Accomplish the Pilgrimage and the Experience for God's sake' (Koran, 1996, p. 196). That had motivated by millions of Muslims innovativeness pilgrimage which (Hajj is a one of the five pillars of Islam) to "Mecca and Madinah", each year for Spiritual satisfactions and religious tourism so, includes all types of tourism that is inspired by religion and wherever the purpose is a spiritual and religious sites. The places might not essentially be related with existing beliefs, meanwhile there were many of the religions in the world history that had become vanished some had left behind remarkable work of arts (temples, churches, shrines, statues) and cultural heritages. (Raj & Griffin Eds., 2015).

The Hinduism followers offer pilgrimage to the Ganges (the holy river) which purifies them from all their sins, Buddhism followers make pilgrimage to Buddha places blessed by their lives, Shintoists go into deep jungles and considered in peace and Christians go to the holy places where God exposed Himself or places linked with Jesus Christ and His saints. (Rebic, 1999).

In other words, a pilgrimage can be considered as any trip with a religious experience. All these trips to religious places are easy to consider as religious tourism, because these trips are clearly a combination of religious experience and travel. However, the definition of religious tourism based solely on the combination of "religion" and "tourism" is of little help in understanding the phenomenon of pilgrimage. It is easy to qualify all travel to religious places as religious tourism, because these trips are clearly a combination of experience and religious travel. (Davies and Davies, 1982).

Through out of history Pilgrimage has been an important part of the religion for centuries. Pilgrimage is a ritual journey with a sacred purpose. Each step of the method makes sense. Pilgrims know that traveling is difficult and there are life-threatening problems Pilgrimage is not a holiday. The path of transformation in which significant changes are occurring, new perspective is being offered. A deeper understanding is gained. New and old places of mind are coming. He receives blessings. Healing is going on. When the pilgrimage returns, life can be seen in a different way. There is nothing left. (Wiederkehr, 2001)

Religious tourism in Pakistan

Most Pakistani Muslims are located in a region where for three centuries there have been three of the most important religions in the world: Hinduism, Buddhism, and Sikhism. In addition to Sikh Gurdavars of historical interest, the country of South Asia offers travelers the opportunity to discover the historical heritage of one of the oldest civilizations in the world and visit a rich collection of Sufi mosques and saints, Hindu temples, Buddhist monasteries and Christians. (Musfa, 2019) The Kartarpur Corridor, a joint initiative between India and Pakistan, is located in the in Punjab. It is intended to link a Gurudwara darbar Sahib, the Indian border. The potential of religious places in Pakistan, especially those related to Sikhism and Buddhism, is likely to increase and requires further efforts. Today Pakistan, is a meeting point for a variety of previous religions.(Baloch, 2007).

Punjab is home to five most important pilgrimage sites for Sikhs. They include the birthplace of Baba Guru Nanak, the founder of Sikh religion who was born in 1469 in Nankana Saheb district, and Gurdwara (monastery) Panja sahib in Hasan Abdal town, where the handprint of Guru Nanak is believed to be imprinted on a boulder at the monastery. (latif, 2017)

In Pakistan, Hindu and Sikh religious sites attract pilgrims. Religious tourism plays an important role in reviving the country's economic activity. Thousands of people attend ancient Hindu and Sikh temples, mainly the Gurunanak Temple. The opening of the Kartarpur corridor (Narowal) attracts more religious tourists to Pakistan.(Mahmood, 2020)

Religious places of Sikhism

Guru Nanak was the founder of the Sikh faith and Darbar Sahib was his last resting place therefore Sikhs consider Pakistan is a holy places for all sikh due to their sacred place where their religion began. Its Punjab province is home to five most important pilgrimage sites for Sikhs including

1. Kartarpur sahib
2. Gurdwara Panja Sahib
3. Gurdwara Dera Sahib, Lahore
4. Nankana Sahib
5. Samadhi of Ranjit Singh, Lahore

Kartarpur Sahib

The Kartarpur sahib aims to provide informal access for pilgrims visiting the sanctuary. The Indian side of Dara Baba Nanak with Kartarpur in Pakistan, but pilgrims visiting Kartarpur Gurudwara do not need a visa and can enter on id cards. Pilgrims can travel in groups or travel individually. The Indian Railways Darbar Baba Nanak has also been upgraded to make pilgrimage to Darbar Baba nanak Station smooth.

Nanak sahib settled down at Kartarpur , where spread the fire of the love of God and love of man, all over the Punjab. Guru Nanak's face shone with the simplicity and serenity born of the saintliness in him. He was a laborer, a tiller of the soil, a servant of the poor and lowly. The life at Kartarpur was a blend of willing work and worship, love and labor, silence and song.(Singh, 1981) Last year on 9, Nov. 2019, Pakistan hosted thousands of Sikhs from across the world for one of their religion's most sacred festivals, the 550th birthday of Sikhism founder Guru Nanak. Where they celebrated birth anniversary, the November 9 was the opening session also of a long-sought visa-free corridor to a holy temple in Pakistani border village of Kartarpur (Narowal) that promises pilgrims from India a reason for elation. To get to the village where the guru died, they had to first secure a visa, travel to the eastern city of Lahore and then arduously drive to the temple or be content with viewing it through binoculars from India. Now, up to 5,000 Indians were allowed access daily through the corridor, which includes roadways, an 800-metre bridge over the Ravi River and an immigration office.

Nankana Sahib

Nankana Sahib is the holiest and popular place for Sikhs around the world. At the time of Guru Nanak's birth, the city of Talwandi was called Rai Bhoi and also Raipur. Rai Bular Bhatti was the leader of this region and the father of Baba Nanak was the employee of Rai Bular. The divine qualities of Baba Nanak were first discovered by his sister Nanaki and Rai Bular Bhatti. Rai Bular donated around 20,000 acers of land around Talwandi in Guru Nanak and the city was called Nankana Sahib. The city currently has nine Gurdwaras, including Gurdwara Janam Asthan, the birthplace of Guru Nanak Dev. Each of the Gurdwaras is associated with important events in the life of Guru Nanak. Around 30,000 Sikh pilgrims visit the city each year and around 15,000 gather in the high season around Guru Nanak's birthday.(sikh holy sharines,2006-09)

Religious places of Christians in Pakistan

Pilgrims have always held an important position in the lives of all believers, not just Christians. Throughout history, Christians have always been there to celebrate their religion in places reminiscent of the Lord and important moments in the history of the church. They came to the sanctuary in honor of those who continued to use the example of the Virgin Mary and the Saints. Her pilgrimage was a process of conversion, a desire for intimacy with God and a confident attraction to her material needs. Pilgrims have always been gifts of grace to the church in different ways.(Rebic, 1999).

1. Holy Trinity
2. St. Patrick's Cathedral
3. Christ Church
4. St. Lawrence Church
5. Sacred Heart Cathedral

Religious places of Hindus in Pakistan

Pakistan's second largest minority also worshiped the water of a Katas Raj temple after Christians because they believed that the lake was filled with tears from Shiva, one of the most important deities in Hinduism. The Katas Raj Temple in the northeast of the Chakwal District and the Sadhu Bela Temple in the south of the Sukkur District are the two most visited religious places of Hindus around the world.

1. Katas Raj
2. jagannath temple
3. Shuda velly
4. Shree Karishna mandir
5. Shiv Mandir
6. Vishnu Tample
7. Nandi Mandir
8. Shri Devi Mata Mandir
9. Karishna Tample (Lahore)
10. Kali Mata tample

Religious places of Jainism in Pakistan

Jain buildings and their architecture in Pakistan are still under investigation. Regular field visits are planned at ground level to visit the Jain heritage and monuments in different parts of the country. Detailed documentation follows the on-site visit after exploration. A separate monument database is being prepared, which will allow us to examine the main features of the architectural tradition that was introduced or adopted by the Jain community in Pakistan.

(Chawla, Hameed, & Syeda, 2019).

1. Jain Tample
2. Nagar Bazaar temple
3. Bhodesar Jain mandir,
4. Karoonjar Jain mandir
5. Virvah Jain mandir,
6. Virvah Gori mandir
7. Jain mander
8. The Quint 800 years jain Tample
9. Nagaparkar Jain Tample

Religious places of Buddhism in Pakistan

Some of the main attractions in Taxila are Dharmarajika Stupa, Bhir Mound, Sirkap, Jandial Temple and Jaulian Monastery. Relics that relate to the Buddhist heritage of Taxila are presented in chronological order in the Taxila Museum. Thousands of tourists are attracted each year to explore the Buddhist heritage. Takht-i-Bhai is a picturesque city 160 km from the capital Islamabad and is the most visited by Buddhists. The large to medium stupas of Gautam Buddha, the founder of Buddhism, and other cultural heritage sites from the northern region of Gilgit-Baltistan to the tourist valley Swat are reminiscent of the region's antiquated civilization. The most visited and holiest places for Bhudism are:

Dharmarajika Stupa

Sleeping Buddha

Takht-i-Bhai

Stupa Of Mankiala

Gandhara civilization

Peace building in Pakistan and its impact on South Asia

We can see how foreign policy has improved over the years, with the creation of an economic corridor with China along the Kartarpur Corridor and now a "social" corridor against the adversity of India's neighbors. The Sikh religious affection is not affected by the expectations of an Islamic republic. Pakistan knows how to respect other religions and recognizes the need for religious freedom, unlike India, which has many conflicts over ethnicity and religion every year. According to Article 36, the Constitution of Pakistan guarantees that the state will protect the legal rights and interests of ethnic minorities. The development of the Kartarpur corridor is part of the same effort to promote religious freedom and harmony of ethnic minorities. (Khan, 2019) The government of Pakistan is facilitating religious tourism with the shared message of peace, harmony and understanding amongst all religions in the world.

Imran Khan's new administration has started very positive efforts to create a friendly environment for long-term construction with all neighboring countries. His first speech after the elections gives hope, as he has shown an understanding of Pakistan's problems and its regional dimensions, mainly peace with India and peace in Afghanistan. The continuous competition between India and Pakistan is one of the biggest challenges of South Asia, a tragedy that has damaged the progress and the correct development throughout the region. The hostility between the two countries spreads across borders, destroying significant socio-political development and many opportunities for trade relations. From there, everyone in the SAARC region would benefit. (Kamboh, Kamal, Nisar, & Kamboh, 2018).

Conclusion

Pakistan is home to some of the huge historical and religious tourist attractions that can help Pakistan increase religious tourism in Pakistan. Pakistan has six UNESCO World Heritage Sites, according to the file. They celebrated this year in the middle Ages by drawing on natural and cultural resources introduced by modern art. Since 2015, it has listed the list of the world's most willing to travel. Pakistan is a religious place of great interest to Sikhs, Hindus, Buddhists, Jains and other nations of the world. The latest report released by Gallup in 2014 was released at the cultural site in Pakistan

consisted 1.6 million visitors in 2014 to the fastest growing visitors. These initiatives can be promoted in other provinces to attract and encourage tourism. Tourists find Mosques, Buddhist sits, churches, archeological sites of different civilization that leave great impact on each tourist to visit their sacred place in Pakistan. Therefore, the federal government should plan to use the country's potential for religious tourism and develop a strategy for preserving religious places and providing services to tourists who come here to visit holy places. Adequate hospitality for believers, in addition to generating income, will help improve the country's soft image.

According to wonderlust Magazine

One of the famous magazine names, wonderlust: Pakistan should be heaving with tourists. The country has it all: the most magnificent mountains, surprisingly good and undeveloped beaches, awesome ancient history, a remarkable mix of cultures, one of the world's greatest road trips, and warm and welcoming people," the British magazine wrote.(wonderlust, 2019)

Recommendations

1. The govt. of Pakistan must take primary responsibility for realizing the hope of the Sikhs and the peoples of the world. The spirit of the Pakistan can be supported by taking measures based on religious harmony, in the truest sense of the word.
2. Preservation of heritage along with religious tolerance is key to restoring the confidence of pilgrim-tourists. Religion, especially minority religions, should not suffer because of cultural domination. The contemporary Buddhist population in Pakistan is around 1492. Though many foreigners used to visit Pakistan
3. Pakistani government should recruit Sikh personnel along with other Pakistani officials for Kartarpur. Pakistan ought to devise a mechanism to ensure respect and security of the Sikh visitors.
4. The Pakistani policymakers should work out the contingency plan to counter any emergency and embarrassing situation. The facilitation of the Sikhs and other minorities should be the main objective of any policy designed or to be designed by the Pakistani authorities.
5. Ensure that the cultural, linguistic, social and nutritional needs of visitors are also taken into account.
6. Therefore, the Federal Government will consider taking advantage of the country's religious tourism potential, developing strategies to protect religious archeological sites, and providing

facilities for tourists coming here to visit sacred sites is needed. Enough hospitality for believers, in addition to generating income, helps to improve the soft image of the country.

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