



# Love for the climate in Sino–Pakistan economic romance: a perspective of environmental laws

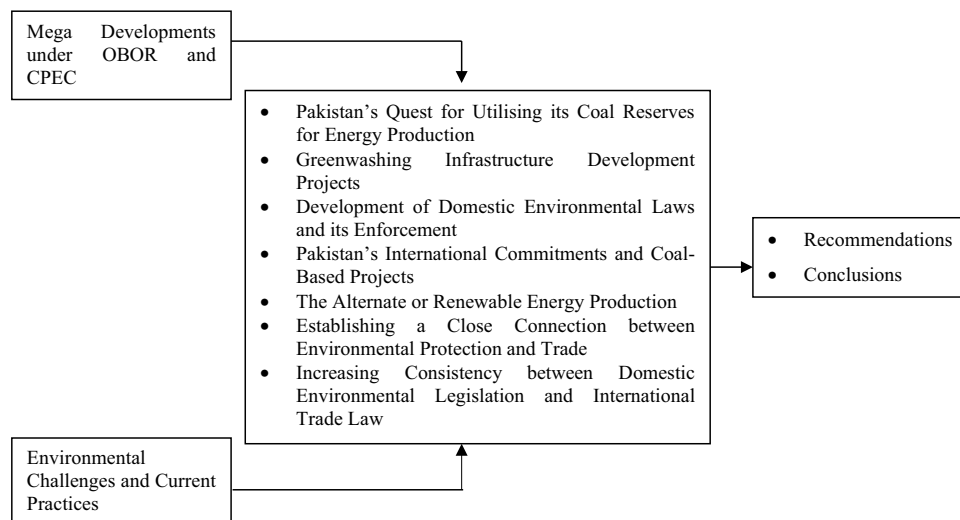
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## Abstract

The natural earth environment has been facing various alterations due to anthropogenic activities even long before the industrial revolution. Economic development can no longer be achieved at the cost of the environment. Sustainable development takes and maintains appropriate environmental standards. This study sketches a thorough analysis of the current situations and likely impacts on the environment from the various infrastructural development projects under the China–Pakistan Economic Corridor (hereinafter CPEC). Most of the potential outcomes of this project are already known. However, there is a limited academic discussion available concerning its environmental hazards coupled with the relevant laws and policies. The study adopts qualitative means of research to carefully investigate into the environmental challenges and current practices following by pertinent observations and recommendations to improve, implement and formulate bilateral or multilateral, environmental standards in the region. This study aims to explore why it is inevitable to revise the CPEC-related projects, such as shifting from coal-based energy projects to renewables and building climate-resilient infrastructure in order to avoid various environmental harms. The study concludes by suggesting that along with economic integration, it is also essential to promote legal cooperation between China and Pakistan concerning environmental laws as an integral part of the national geopolitical policies to make CPEC a long-lasting as well as a more safe, secure and sustainable project.

## Graphic Abstract



**Keywords** China–Pakistan economic corridor · Environmental challenges · Current practices · Coal-based energy · Renewable energy · Environmental laws

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## Introduction

Environmental issues have been affecting human and non-human life since the initial history of humanity and continue at different levels and forms (Li 2018). Environmental researchers have cautioned about public discontent or social conflicts due to the expected challenges of environmental pollution in the future (Pan and Gong 2015). The natural earth environment has been facing various alterations due to anthropogenic activities even long before the industrial revolution (Kiss and Shelton 2007). The detrimental impact of changes has become a global concern with time. The occurrence of abrupt variations in environment witnessed the large-scale destruction of infrastructure, roads, parks and natural ecosystem across the globe (BBC 2017). The various forms of ecosystem components, for example rivers, lands, streams, sea and even ocean, are equally affected by the rapid pace of pollutants in the air, water or soil (Hao et al. 2018). It was realised that the environmental protection laws need global concern, goals, priorities, policies of social reformers, scientific communities and civil or governmental supports to develop and achieve sustainable environmental goals for the present as well as for generations to come (Danvers 1999).

China is heading towards the huge economic developments over the globe with the One Belt One Road (hereinafter OBOR) Initiative, which includes economic activities covering the areas from China to East Asia, Eurasia, South Asia and the African States. The project intends to launch numerous sub-projects, for example roadways, railway lines, energy infrastructure and maritime routes in various States connected thereby. According to a research report titled ‘The Potentials of One Belt One Road’, the States in conjunction with the OBOR cover 63% of the world’s populace and 29% of the gross domestic product (GDP) (Global Capital 2015). The OBOR initiative has revolutionised the world order and presented new trends of diplomacy, bilateral relations, economic, trade and legal reforms. The megaprojects have further divided into several branches. CPEC has been termed as an essential part of the OBOR initiative and regarded as the ‘game-changer’ in this region. The significance of this project is that it connects China to the Middle Eastern States, where it meets 52% of China’s oil demands, and imports need (Rahman and Shurong 2017). In addition to this, the route will also open China to the Indian Ocean that will add and strengthen China’s maritime capacity in this region. The overall impact of these activities will bring numerous economic prosperous opportunities for the economy of Pakistan which includes long road infrastructure of approximately 2500 miles, railway lines, construction of Gwadar international airport and Gwadar port, intensive

22 power and energy projects with the generating capacity of nearly 14,000 MWs, Gwadar East-Bay Expressway, Gwadar Technical and Vocational Institute, Pak–China friendship hospital, construction of breakwaters, development of various trade zones with industrial parks, Bao Steel Park, Gwadar Smart Port City Master Plan, Gwadar University, stainless steel, petrochemicals and other industries in Gwadar and the installation of fibre optics (Bhattacharjee 2017a, b).

The debate on different pros and cons of CPEC is not a national or the regional phenomenon, but this mega-multi-billion-dollar project is a source of interest, anxiety and concern in different important capitals of the world (Ahmar 2018). If CPEC is termed as a ‘game-changer’ or a ‘lifetime opportunity’ for Pakistan to transform from an under-developed to a middle-income economy, one also needs to visualise and contemplate how it will impact on the country’s financial, environmental and societal patterns. Although the project brings great expectations to the economy of Pakistan, however, the adverse effects on the environment can never be ignored with the construction of new power plants and grids, additional consumption of fossil fuels, roadways and railway lines, huge infrastructure, industrial zones and increased flow of heavy traffic on this route. Eventually, these developments will have significant effects on air and water quality, agriculture and wildlife, the habitat of flora and fauna, biodiversity and overall ecology particularly across Pakistan and consequently affecting the whole region at large. The exact scope of this impact is yet to be seen and merits an in-depth study. Therefore, this study will observe whether the stakeholders have undertaken various pertinent impact assessment strategies such as environmental impact assessment (hereinafter EIAs), strategic environmental assessment (SEA), initial environmental examination (IEE), change impact assessment (CIA) or social impact assessment (SIA). Also, the required measures regarding international commitments about handling the carbon emissions under the appropriate conventions, treaties and protocols in which Pakistan and China have signatory position and ratified those, will be taken into consideration.

The environmental effects share no boundary. Therefore, both China and Pakistan should comprehensively analyse and consider their national strategy, environmental and economic interests and issues surrounding ecological security to align and establish a strategic approach, template and timetable for negotiations on environmental provisions. China should depart from the current practice where environmental provisions are formulated in a case-by-case fashion and differ in each free trade agreement (hereinafter FTA) (Haifeng Deng and Jie Huang 2018). Instead, China should put forward a high-standard ‘Chinese version’ of trade-related environmental provisions and adopt it in China’s future FTA negotiations in order to make the OBOR-related

megaprojects more successful. It can help to ensure that China's trade-related environmental obligations are consistent with its FTAs.

Pakistan's quest for the coal's utilisation to meet its energy demand is natural and obvious. However, investing largely in the coal-based energy projects will eventually raise numerous environmental issues, so in spite of having the capacity, why not to shift this focuses to produce the renewable energy in Pakistan? In the post-Paris era, the onus is on all states to pursue decarbonisation towards net zero. However, Pakistan is moving towards the opposite direction by focusing more on the coal-based energies. It is due to the poor economic situation in Pakistan coupled with the energy shortage as well as inefficiency, and the country wants to utilise its natural resources to meet its urgency in the energy sector. Eventually, it puts an increased responsibility for the core environmental stakeholders in this joint venture, including the government officials or departments and local or international environmental non-governmental environmental organisations (ENGOS) for taking appropriate practical measures.

The study presents the background knowledge about the environmental laws of China and Pakistan and adopts qualitative means of investigating the environmental significance to examine and explore the damaging effects of the CPEC-related projects; special attention has been paid to infrastructure development and the coal-based energy projects. It tends to highlight the adverse side of the transactions and to find a better way out of the expected environmental challenges. The study addresses the relationship between contextual environmental governance and brings the attention of the key stakeholders under CPEC to consider the environmental assessment strategies, for example EIA, SEA and IEE. The main argument of the study includes referring to the various stakeholders for reviewing the legal ties under CPEC and made necessary amendments considering the environment as an integral part before it may get too late for such interventions to be made. To this end, a systematic and in-depth discussion and analysis of the environmental conditions and relevant laws and policies of these two States is conducted to examine patterns of influence with contrast to the sensitiveness of the established environmental systems under the megaproject of CPEC. Table 1 provides an overview of the significance and details of development projects under CPEC. Table 2 presents the SEA, relevant legislation and explicit features or situation in both China and Pakistan. Section 2 explains and discusses the various developments under the OBOR and CPEC projects, whereas Sects. 3 and 4 are the core sections of the study, which include the discussion, environmental challenges with a comparison of the current practices and analysis coupled with detailed recommendations for better solutions. These components are scrutinised cohesively in these sections, followed by the results

discussed in light of the description of the States perspectives as well as the obligations of international environmental laws and commitments.

## Mega-developments under OBOR and CPEC

### One belt one road initiative

OBOR is a megaproject to tie China not only with the other Asian States but also Europe, the Middle East and the African States. The project is likely to play a key role in regional cooperation with new fashion, great interest and loyalties of the member States. The global economic crisis and domestic social issues pushed China to discover new partners or the export markets across the globe to maintain sustainable economic conditions, especially in the neighbouring State and the region as well. Eventually, the contemporary Chinese political leadership coined a new slogan 'New Silk Road' or OBOR initiative to revise the trade and economic order in the region (Cai 2017). The Chinese leaders proposed this initiative to strengthen road connections and promote joint economic cooperation aimed to establish an intensive transport corridor connecting Central Asia to the Indian Ocean and the Pacific to the Baltic Sea, eastern, western and southern Asia, increasing economic competitiveness, eliminating trade barriers as well as reducing trade and investment expenses strengthen monetary cooperation and people-to-people relations (Szcudlik-tatar 2013). Though, there are some reservations over the geopolitical implications in these China-orientated routes of connectivity (Aris 2016). However, this initiative was taken to draw a gradually explicit bridge between domestic and foreign affairs referred to as OBOR initiative. There are great expectations associated with the OBOR to improve the regional connectivity and economic integration among the member States.

### CPEC: magnitude of the project

The CPEC is a multi-billion-dollar project signed between China and Pakistan, which was officially launched in 2015, and proposed to be entirely operationalised by 2030. It connects China to the Middle Eastern States through a long roadway as well as railway networks spanning 3218 kms from Chinese Province Xinjiang to the Gwadar Port in Western Pakistan (Deloitte Pakistan 2016). The route also includes various economic zones with industrial parks, pipelines, mega-infrastructureal development plan and energy projects. In addition to the time-tested cooperation in the military and diplomatic arena for the last few decades, the project is believed to bring additional strengths between the two neighbouring States to become regional partners in the sphere of economy and trade. Table 1 presents the salient

**Table 1** Overview of the various development projects under CPEC

Names of the projects	Description
Proposed routes	There are three major corridors or routes of the CPEC project: Eastern, Central and the Western Routes. The 'Eastern Route' will create a link between two main business cities of Pakistan: Lahore and Karachi, the 'Central Route' will connect Baluchistan and Khyber Pakhtunkhwa Provinces, and the 'Western Route' is designed to bridge the key project of CPEC: Gwadar Port to the Baluchistan and Khyber Pakhtunkhwa Provinces that will further link to the Xinjiang Province in China at Khunjrab pass (MPDR 2020a)
The pipelines under CPEC	The oil and gas will be liquefied or transported from the Middle Eastern States to China through a network of pipelines that will reduce the current long distance of 12,537 miles down to 2295 miles with a time frame of reaching the consignment from 16 to 3 days only. The Gulf Today 2017 consequently, it will make CPEC an energy corridor too, connecting China not only with the Middle East but also Afghanistan, Iran, Central Asia and even possibly India (MPDR 2020b)
Railway network	An existing railway line (ML-1) is scheduled to be upgraded by 2022 with an approximate sum of US\$ 8 billion. The up-gradation will increase the current train's speed up to 140 km/h that will save the additional time of this transit. It will serve as a significant expansion of Pakistan's railway network connecting with the Kashgar City of China in Xinjiang Province (MPDR 2020c)
Roads or highways	The road projects of CPEC which are currently underway will connect Chinese province of Xingjian to Western's Pakistan at Gwadar Port. It will cover approximately 2500 miles long roads network (MPDR 2020d)
CPEC energy projects	CPEC is worth eliminating the power shortfall and significantly strengthens Pakistan's energy capacity with a total of 22 energy projects comprising about 14,000 MW according to the present plan with an estimated cost of US\$ 27 billion. The projects include coal, solar, wind, hydel, imported fuel and transmission lines as well (MPDR 2020e)
Special economic zones under CPEC	The corridor also brings various special economic zones (SEZ) at different locations, which will further ease and promote the essences of the trade in the regions. The unique locations of these economic zones include Moqpondass SEZ at Gilgit-Baltistan, SEZ at Mirpur, Azad Jammu Kashmir, Information, Communication and Technology (ICT) model industrial zone in Islamabad, development of industrial park on Pakistan steel mills land at Port Qassim near Karachi and China special economic zone Dhabeji (MPDR 2020f)
Other development projects under CPEC	Other than the developments mentioned above, CPEC will bring many more that will take Pakistan towards an economically prosperous State. The various projects include construction of Gwadar international airport, Gwadar port, Gwadar East-Bay Expressway, construction of breakwaters, development of various trade zones with industrial parks, Bao steel park, Gwadar University, pilot project of Digital Terrestrial Multimedia Broadcast (DTMB), Gwadar smart port city master plan, stainless steel, petrochemicals and other industries in Gwadar (Bhattacharjee 2017a, b; MPDR 2020b)

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features for understanding the magnitude of the CPEC-associated projects and economic activities as briefly explained hereunder:

## Environmental challenges and current practices

### CPEC: potential constraints and environmental threats

Though having rigorous benefits claimed through the CPEC project, it is more likely to imagine a scenario without facing adverse environmental effects alongside the construction of mega-infrastructure of roads and railway lines as well as the installation of heavy machinery and fuel burning including coal at various energy production units. The adverse impact on the ecological lives of the local people might be

intensified. It will need careful planning and mitigation at this stage before the implementation of these projects by making concerted efforts to maintain and conserve the environmental concerns. There is enough room that the lakes, rivers, game reserves, mountains and sanctuaries might be polluted by the CPEC-related anthropogenic activities or incredible infrastructure developments, which merits considerable and thoughtful efforts in terms of coordinated planning and policy formation for the preservation of these natural resources well in time (Sarwar 2016).

In addition to the resources and environment, the impact of round-the-clock traffic, dust particles, suspended solid particles, deforestation and emissions of poisonous gases from other large-scale construction or development projects would consequence to contribute in greenhouse gases (Hereinafter GHGs), loss of biodiversity, air-borne diseases as well as respiratory problems, and deteriorate the soil, which may result as floods in these areas (Mehwish Qayyum and

**Table 2** SEA systems-relevant legislation and explicit features or situation in both states

States	SEA system and core legal documents	SEA features and situation
China	Law of PRC on environmental impact assessment 2002; Plan EIA ordinance 2009; revised environmental protection law of the PRC 2014	Different plans have specific requirements for quality control of state representatives and a group of specialists; it is required that half from the group members must possess the specialists Various typologies of plans need numerous kinds of assessment such as comprehensive plans must possess an impact assessment statement, a chapter of environmental impacts and some other specified special plans (Ali et al. 2018b, a)
Pakistan	Federal and provincial environmental protection agencies in collaboration relevant departments of Pakistan; Section XII of the PEPA, 1997; Provincial environmental protection acts	The Environmental Protection Agencies possess relatively weak capacities; Poor quality of reports, least amount of budget for SEA research and weak coordination among various stakeholders during EIA or SEA studies; Not mandatory under the law; The Environmental Protection Agencies lacks financial and technical resources Demands political priority for natural resource and environmental management Pakistan has less expertise or experience in the research or studies of SEA systems (Monteiro et al. 2018)

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Muhammad Bashir 2018). All this is happening in a crucial time when Pakistan is already facing extreme weather patterns and seasonal shifts and suffering from the global warming, and climate change issues as nearly 5000 of its glaciers are melting, which have potential impacts on agroecology of the State (Zahoor 2016). With the suspended particles in the air due to construction works and heavy traffic, it would be difficult for the Government of Pakistan to handle the smog issues such as the Punjab Province is already facing smog issues in the winter seasons (Nabi et al. 2018). Beyond this, a report devised by the WWF-Pakistan states that around 20% of roughly one million migratory birds passing through Chitral fall prey to hunting now would lose the habitats and will eventually move or would get extinct due to these mega-infrastructural developmental projects (WWF-Pakistan). It is the right time to cover the unchecked pollution areas in order to avoid worsening impact on the water quality and quantity as well and to ensure sustainable development.

## Environmental impact assessment

### EIA in Pakistan

EIA strategy is a legal requirement which is considered under the obligations of national environmental legislation policy of both China and Pakistan as well as of United Nations Declaration on Environment and Development,

which is duly ratified or endorsed by both States (Saeed et al. 2017). EIA proposes and recommends the possible control measures which are imperative to address or to mitigate the possible effects of any development project to protect the environment as well as to protect the identified affected ecological segments.

EIA was initiated in Pakistan under the Pakistan Environmental Protection Ordinance (PEPO) 1983, which was later withdrawn and substituted with Pakistan Environmental Protection Act (PEPA) in 1997. It is the legal requirement under section 12 of the PEPA to file a detailed environmental impact statement before the commencement of a project to the concerned environmental protection agency (EPA), federal or the provincial, which is likely to cause effect on the environment (EPD). Section 12 of the Act also comprises several provisions or clauses for imposing a fine in case of non-compliance, lump sum or on a daily basis. However, SEA is not mandatory in Pakistan, but some of the SEA elements have been voluntarily implemented without legislative provisions, for example public participation (Victor and Agamuthu 2014).

### EIA in China

In China, it is mandatory to conduct an EIA procedure as well as obtaining an EIA approval certificate for all the construction projects (State Council 2017). It is obligatory

requisites under Article 9 of the amended Regulations on the Administration of the Construction Project Environmental Protection that all the construction projects should conduct and obtain EIA approval certificate which may affect the environment. It is required not only before the commencement but also for any modification, expansion and renovation of the project. The approval can also be disapproved by the concerned authorities on the breach of any binding rule (Hangsheng 2009). The environmental protection department applies the scrutinising process and then approves or grants EIA certificates if the required criteria are duly met by the construction party (State Council 2017). In addition to the decorum mentioned above, the provinces, municipalities and autonomous regions also impact the scope of authority in approving an EIA certificate (Watkins and Latham 2017).

### Effects of EIA under CPEC

This joint venture will have a substantial impact on natural habitats, resettlement, dislocation or migration of the local people and cultural or social issues, which should be addressed before the execution of the project. It demands to fulfil a legal requirement to hold due impact assessments in order to achieve the sustainable development goals (SDG) for which Pakistan is a signatory to the United Nations Convention for Climate Change (UNFCCC) (Sohail et al. 2014). According to a statement of the country representative of the International Union for Conservation of Nature (IUCN), the technical capacity of environmental protection agencies is justified to carry out sound EIAs since the environment became a provincial matter in Pakistan. However, the environmental footprint of this megaproject is unpredictable. It is still not too late to conduct the EIAs for these projects. The government should collaborate and get technical assistance from relevant organisations, for example ICUN, to make these activities more ecologically friendly and sustainable (Ebrahim 2017b).

### Strategic environmental assessment system

The relevant literature review indicates that the SEA has been established mostly or primarily under the fold of EIA for construction or development projects (Noble and Nwanekezie 2017). It has also been termed as 'EIA-based' model of the SEA. The EU-SEA Directive (European Commission 2018) is a good example of the 'EIA-based' model of the SEA (Fundingsland Tetlow and Hanusch 2012), which does not only determine the institutionalisation inside the allied countries, but also acknowledges how the SEA legal framework: strategies, policies, legislation, plans and programmes, have been adopted in other developed countries (Di Ludovico and Fabiatti 2018). Besides, the dynamic operational forces of the SEA systems have been recommended

to be mostly inspired by administrative frameworks (Slunge and Tran 2014; Meuleman 2015).

The governments in both counties should not only introduce new policies to administer SEA system and ensure its strict implementation but also pay attention to the capacity building and disbursing adequate funds to the environmental protection agencies to prevent environmental harms and greenwashing from the development projects.

## Carbon emissions scheme in Pakistan

### Pakistan's climate change policy

In 2003, Pakistan submitted an Initial National Communication on Climate Change Report to UNFCCC (Iqbal 2003). This report includes national GHG information for the period of July 1993 to June 1994. However, the government fails to update it on a regular time interval. The government of Pakistan joined the Kyoto Protocol in 2005, which is administered under the Ministry of Environment & Climate Change (Kyoto Protocol 1997; Sohail et al. 2014). Under this agreement, the Clean Development Mechanism (CDM) has been initiated to mitigate GHGs and for the promotion of a green environment. GHGs information is also developed that is referenced in the concluding report of the Task Force on Climate Change working under the Planning Commission of Pakistan, which indicates to take preventive measures well in time (Ali 2016).

### Perspective for low carbon development

The primary focus of foreign investment allocated for CPEC has been on energy and transportation projects due to severe scarcity of energy resources in Pakistan. China's GHGs ratio has also increased in recent years at an alarming rate (Chang et al. 2018). China claims to make sustainable development under OBOR by exploring renewable energy resources to avoid hazardous carbon imprints (Zubedi et al. 2018). Due to the graveness of the prevailing scenario, a significant number of power plants or coal power projects may be shut down in Pakistan due to high carbon emission (Reynolds et al. 2018). Therefore, adequate measures need to be taken to implement green Information, Communication and Technology (ICT) for renewable energy resources. Green ICT has the potential to make a fundamental difference in the lives of local communities by endorsing green energy and environment-friendly technologies (Shruthi 2014). It has also been described as a GHG emission reduction tool in terms of establishing international standards (Fan et al. 2013). It is observed that renewable sources, together with effective ICTs, can assist GHG reduction techniques to invert the adverse impact of climate change (Zubedi et al. 2018).

## Pathway for sustainable development

CPEC is a joint venture where the primary focus is on Gwadar Port while the transport sector, infrastructure development, energy efficiency and industrial cooperation are other significant components. Even though the investment is enormous, it is indispensable to ensure that environmental sustainability is not endangered. The biggest challenge towards sustainable development is climate change across the globe. Its widespread impact is vivid on our ecosystem as well.

On the one hand, it causes an extreme change in climatic conditions resulting in floods, droughts, typhoons and earthquakes, while on the other hand, it affects the production of food, water availability: quality and quantity, forests, biodiversity, coastal and marine environment (Khan et al. 2016). Due to the adverse impact of climate change in Pakistan, it ranks 16th regarding the index of vulnerability among 170 States, and 135th internationally concerning global GHG emissions per capita (Verisk 2010). The average annual temperature in Pakistan has increased by 0.6° during the last century. The 2012 Global Climate Risk Index of Germanwatch has ranked Pakistan as eighth worldwide (Harmeling 2012). To achieve the SDG, a new infrastructure which is compatible with green ICT needs to be incorporated in the CPEC routes for reducing the environmental impacts of existing infrastructure. The region is, however, at the edge of accelerating carbon release because of its rapid development in recent decades.

## Carbon emission scheme in China

### Emission trading scheme

The Government of China has initiated a pilot project regarding carbon emissions trading initially in seven provinces (Bodansky et al. 2015). In 2014, the National Development and Reform Commission (NDRC) in China had released Interim Regulations on Administration of Carbon Emission Trading (Zhang et al. 2017). The ‘Chinese Certified Emissions Reductions’ (CCER) and the ‘emission quotas’ were the fundamental objectives of carbon emissions trading in these pilot areas (Duan et al. 2014). Besides these pilot projects, the national united carbon emissions trading market place was also developed by NDRC (Feng 2013).

### Monitoring, reporting and verification

Monitoring in a national system is conducted by the covered entities from the industrial as well as non-industrial sectors through direct ways followed by finalised reports for monitoring, reporting and the verification system (MRV) for carbon emissions trading (Swartz 2013). The main components of MVR include monitoring methods, appropriate

parameters, monitoring costs and practicability in order to enhance disciplinary efficiency (ADB 2014). The report should follow a straight reporting period and verified by a third party (Wartmann et al. 2009). The Market Readiness Proposal (MRP) examines the requirements, qualifications, standards and other miscellaneous prerequisites of the verification sector (NDRC 2013).

## China’s certified emission reduction scheme

In June 2012, the NDRC released ‘Interim Measures on Chinese Voluntary Emissions Trading’, which proposes measures to offset carbon emissions through credits produced by certified projects voluntarily (Khan and Chang 2018). It was anticipated that these measures would support the seven obligatory ETS pilots in China by contributing an offset apparatus to the local units (Swartz 2013). Eventually, this development improved the capacity and institutional capability to address ecological issues in China. However, these interim measures will not exceptionally apply to these seven pilots if not duly approved by the NDRC (GPPG 2014).

## Discussion and analysis

### Pakistan’s quest for utilising its coal reserves for energy production

China is going to invest more than US\$ 46 billion under CPEC, of which, US\$ 34 billion has been assigned for energy projects including coal, wind, hydro and solar. Eventually, it will serve as a natural and fastest solution to Pakistan’s energy and power crisis (MPDR 2014). The imported petroleum products constitute almost 90% of fuel consumption in Pakistan (Downs et al. 2017; Kugelman 2017). According to policy documents, Pakistan possesses the coal reserves of around 186 billion tons, and the government proposes to raise annual production of domestic coal from 4.5 to 60 million tons to shift its dependence on imported fuel to the cheap indigenous energy sources, for example coal (MPDR 2014). It is also worth mentioning here that China is closing its coal-based power plants because of environmental degradation, but at the same time, transferring them to Pakistan in complete disregard of international environmental standards (Hadi et al. 2018).

China is the largest coal producer in the world, adds almost half of global consumption, and eventually, regarded as the largest source of carbon emissions (US EIA 2014). Coal is the leading cause of damaging air quality and overall environmental hazards. Therefore, coal-based power projects under CPEC could also have a destructive environmental impact in the long run (Saleem 2017). The Global

Climate Risk Index of 2017 ranks Pakistan among the ten most affected countries (Kreft et al. 2017).

### Greenwashing infrastructure development projects

Greenwashing is considered an ecological whitening strategy used by the enterprises, commercial companies and even by the governments to demonstrate the environment-friendly image of the relevant projects to the general public (Achour 2017). It includes spending a large amount on advertising and public relations strategies concerning the development projects, which portrays their environmentally benign (White 2003). In this way, despite the use of ideological campaigns, efforts and coercive measures to co-opt environmental concerns, ordinary people continue to face environmental degradation in their lives.

The affected residents reserve the right for legal actions if they witness any greenwashing practice by either party and draw the attention of the relevant policymakers to set the misleading environmental claims straight (Achour 2017). However, many of the environmental reservations have been seen in Pakistan, but there is a lack of information and awareness concerning these solutions. Therefore, the various shareholders from both countries should consider and take appropriate measures concerning criminological imagination to contribute in these struggles by rethinking how new regional integration can diagnose, deter and prevent ongoing environmental harms to the local people. It will further help to make the CPEC a clean and environment-friendly project (White 2003).

### Development of domestic environmental laws and its enforcement

As the environment changes, the contemporary climate change requires the States to take appropriate policy measures to achieve the goals of sustainable development successfully. To this end, China has achieved much in the way of pertinent legislation including the thorough revision of the Environmental Protection Act, 2015, and introducing the Environmental Protection Tax Act implemented since 2018 (Zahar 2018). In contrast, Pakistan is still facing problems in addressing its environmental challenges and ranked among environmentally vulnerable countries in the world (Anastasiou et al. 2018). The current situation, therefore, merits that Pakistan should prioritise not only the development but also strict enforcement of domestic and international environmental laws, and China could assist in achieving this goal to smoothen the regional environment. It is unfortunate that the current practice is perhaps moving towards the wrong direction by ignoring these much-needed capacity developments; for example, China is reducing the exploitation of its coal reserves and helping Pakistan to generate coal-based

energy (Ur Rehman et al. 2019), instead of assisting it in developing renewable energy, whereas both the countries have obligations to minimise the coal usage in the 2015 Paris Agreement. Besides, both countries should consider that all the joint projects under CPEC should adhere to the guidelines of the regional or international environmental laws or treaties such as the Paris Agreement on Climate Change, Sustainable Development Goals, Aichi Biodiversity Targets, Sendai Framework for Disaster Risk Reduction and so on.

### Likely environmental impacts of CPEC-related projects

Environmental issues are also of great concern as China's coal-fired power plants, tree loss and other related projects can have a lasting negative impact on the Pakistani environment. These effects can have severe repercussions on local flora and fauna. However, the Pakistani government is trying to counter this threat through preventive measures such as the One Billion Tree Project in KPK Province. In addition, there has been unrest in the local Gwadar community regarding the hospital and college developed as part of the initiative that will mainly offer its services to Chinese personals (Hadi et al. 2018). It is also expected that the Pakistani economy could be adversely affected compared to China due to the removal of tariffs under Pakistan and China. The main fear associated with the CPEC results for Pakistan is that it could lose more of its wealth, effective GDP and trade balance while China will prove to be the real winner of the situation (Hussain and Ali Shah 2017). However, the vision of the CPEC project as a whole will enable the Pakistani government to develop and implement viable systems to ensure long-term sustainable economic growth (Ahmed and Mustafa 2017).

According to an IUCN report, around 54,000 trees were felled in various sub-projects for the construction of the CPEC infrastructure in KPK (Ebrahim 2017b). It is a threat to climate change and the agricultural sector. The current rise in temperature and the shortened winter weather are signs of the problem. It is assumed that the productivity of the agricultural sector will decrease. It appears that the EIA was not carried out properly before the CPEC began. A lack of transparency, vague investment conditions and high credit conditions from China and especially the bureaucracy culture can discuss this controversially (Ebrahim 2017a).

The CPEC has around 19 energy-related projects which are a mix of coal, idle, solar and wind; there are only three hydropower projects with a total output of around 2700 MW (MPDR 2020e). While there are also some projects competing renewable energy, most of them have no significant potential, except for the Quaid-e-Azam solar park with a capacity of 1000 MW. In contrast, there are ten coal power projects with an estimated capacity of 8880 MW (Ali 2018a,



b). Therefore, there can be concerns about the carbon dioxide (CO<sub>2</sub>) emissions associated with coal-based thermal energy projects that could seriously damage the environment. Above all, the timing of these environmental issues is crucial when Pakistan is already facing extreme weather patterns and seasonal shifts, suffering from the global warming, and climate change issues as nearly 5000 of its glaciers are melting, which have potential impacts on agroecology of the State (Zahoor 2016).

### **Pakistan's international commitments and coal-based projects**

According to report released by the Asian Development Bank (ADB) regarding the evaluation of power sector of Pakistan represents that every 10GW generation capacity under the CPEC (ADB 2018) will intensify GHG emissions substantially that might have a serious impact on the climate change mitigation. In addition, disposal problems and ash handling will also aggravate adverse effects on the environment. The report further depicts that an immense increase in fossil-fuel or coal-based power generations will add to environmental degradation and climate change. However, the bank itself is currently financing 600 MW coal plant in Jamshoro with an agreement of US\$ 900 million project signed in March 2017 (Ahmed 2018).

A research (Naureen et al. 2017) concerning the carbon emissions of existing coal-based power plants under the CPEC project has revealed some surprising results. The study reveals that out of 5580 MW of coal-based power plants generation, the total carbon emission released out of these power projects is 75,979,636.4 tons. It is also pertinent to mention that China and Pakistan are signatories to the 2015 Paris Agreement to bring down the use of coal to minimise the impacts of global warming. Besides these facts, Pakistan is contributing more to coal-based energy production to meet its energy crisis, whereas the most recent data demonstrate a reduction in coal usage in China for the third consecutive year in the fulfilment of its international commitments towards climate change coupled with extensive coal usage (Saeed 2017; Ali et al. 2018a,b). It puts shared responsibility on both States to implement the provisions of the 2015 Paris Agreement in the real sense.

### **The alternate or renewable energy production**

A report titled Global Trends in Renewable Energy Investment 2017, by the UN Environment Program (UNEP), represents US\$ 241.6 billion investments in renewables in 2016 (excluding large hydro) (UNEP 2017). The report also reveals that in 2016, around 138.5 GW energy from renewable sources was included in global power capacity, which shows the global trends towards promoting the power

generation from renewable energy sources (UNEP 2017). Keeping in view the above scenario, it is fair enough to comment that instead of focusing on the renewables, Pakistan is possibly going in the opposite direction by largely promoting coal-based energy projects which have serious environmental consequences. It is noteworthy that Pakistan has around 167.7 GW of renewable energy potential, which is enough to meet its total energy demand (Rafique and Rehman 2017). Despite the massive potential of renewable resources, Pakistan adds less than 1% from the renewables in the energy mix (Sheikh 2010).

### **Establishing a close connection between environmental protection and trade**

There are some trade agreements between the other countries of the world where trade is happening with due consideration of the environmental significance, such as the EU-Canada Comprehensive Economic and Trade Agreement (CETA) (European Commission 2017). China and Pakistan should also render and make positive contributions to sustainable trade liberalisation as the USA, Canada and Mexico have made in the North American Agreement on Environmental Cooperation (NAAEC). NAAEC bounds the parties to make a contrast between their policies, laws and regulations, and environmental protection (Allen 2012). On 30 November 2018, a new United States–Mexico–Canada Agreement (USMCA) was signed that is also regarded as ‘What the USMCA–The New NAFTA (North American Free Trade Agreement) which Means for The Environment’ (Miller 2018), to bring down potential trade and environmental conflicts, enhance regional environmental collaboration and encourage as well as endorse the effective enforcement of environmental laws (GOC 2018).

Another example is MARPOL 73/78. However, compared with these FTAs, the CPEC should impose a greater number of compulsory obligations on China and Pakistan, not only for taking measures to enforce MARPOL 73/78 but also to make these measures publicly available (Haifeng Deng and Jie Huang 2018). Besides, in the arena of international law, however, there is no specialised agreement in WTO on ‘trade and environmental’ issues. However, it indirectly influences the trade parties to ensure environmental protection in its Article XIV (a), (b), and (c) of the General Agreement on Trade in Services (GATS) and Article XX of General Agreement on Tariffs and Trade (GATT) (Storey and Sverige 2006). These provisions should have been incorporated into the terms and conditions under the operations of CPEC energy projects. It may also be feasible for the stakeholders for determining how the dispute resolution panels will apply WTO case law about these provisions (Ciuriak and Ciuriak 2016).

Trade between neighbouring States should not be held at the cost of the environment. The illustrations as mentioned above may be considered to learn lessons for formulation and then implementation of various bilateral agreements between China and Pakistan concerning the climate change mitigation as well as safeguarding the whole environmental situation in the region.

### **Increasing consistency between domestic environmental legislation and international trade law**

China and Pakistan should seek to harmonise their domestic environmental legislation with international trade laws. It is of crucial importance to establish a domestic environmental law system that corresponds to international trade rules (Meltzer 2014). However, there is a lack of consistency between domestic environmental legislation and international trade rules; for example, the Chinese Foreign Trade Law only briefly addresses environmental protection. In contrast, only a few provisions relating to trade appear in China's environmental laws, including the China Environmental Protection Law and the Drug Administration Law (Mu et al. 2014). Both States should hasten the introduction of legislation on environmental protection concerning the legislative gaps in areas of environmental protection such as medical waste management, blood test waste disposal and the elimination of ozone-depleting substances (Khan 2017). The next steps should include expanding the coverage of related environmental legislation and enhancing the practical operability of those laws by amending ambiguous legal principles. They should then look at aligning the technical standards in local or domestic environmental laws with the environmental standards contained in international trade instruments.

### **Recommendations and conclusion**

Pakistan and China need homogeneous commercial codes and legal cooperation mechanisms to make a more reliable infrastructure development of CPEC (Ali 2018a,b). Under the prevailing scenario and given a literature survey of existing studies, the government of Pakistan needs to strictly precede and adhere to a distinct growth plan by incorporating green ICT for all projects under the head of CPEC (Shruthi 2014; Zubedi et al. 2018). China is actively promoting large infrastructure projects to countries alongside the OBOR Initiative (Li 2015). However, China has concluded few FTAs with these States, and it is unrealistic for China to conclude FTAs with all OBOR States in a short period (Huang 2016). Some of these OBOR States and NGOs have strongly urged China to be

environmentally conscious in its implementation of the OBOR Initiative (MOFCOM 2018). China should seek mutual recognition of environmental protection measures and environmental standards with countries alongside OBOR and CPEC. Sustained efforts by various stakeholders from both China and Pakistan in CPEC are the prerequisite to make a considerable contribution for achieving the environmental commitments, sustainable development goals, and ultimately building a better world. Pakistan should consider coal-based energy production as a short-term solution and shift over the renewable energy sources to make this venture long-lasting and environmentally more safe, secure and sustainable. Besides, the bilateral exchange of environmental lawyer's programme from both China and Pakistan should be promoted to comprehend legal regime concerning the environment.

Regional empowerment coupled with various economic concerns is a good Chinese strategy, which will help to implement its vision of peaceful rise in a great deal: OBOR and CPEC perhaps reshaping the world with a new economic leader. However, the core concerns highlighted in this study are the environmental issues attached to the mega-developments under these projects, which are obligatory to be addressed before it may hurt the various stakeholders. The States, alongside the OBOR and CPEC, are versatile in terms of economic stages and environmental standards. Therefore, China should encourage them to mutually recognise each other's environmental protection measures and environmental standards. To this end, China can adopt mutual recognition of environmental protection measures and environmental standards by actively signing bilateral and multilateral agreements on environmental protection and thereby reduce environment-related trade friction.

The mega-developments under CPEC will eventually cause huge environmental impacts to GHGs, climate change and global warming, which are necessary to encounter at this stage before it may get too late. Pakistan should consider coal only as a short-term solution to address its energy crisis but necessarily take the procurement measures, including the implication of modern technology and stern policies so that adverse environmental implications are minimised. There is a need to take collaborative as well as comparative environmental measures by both States to make CPEC more successful and environment-friendly particularly for this region and the whole world at large; the observations and recommendations made under this research may be helpful to achieve these sustainable development goals.

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