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CONTENTS

DAM-BUILDING IN INDIA AND CHINA – LESSONS LEARNT

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Executive summary

The utility of dams cannot be ignored as an effective tool of water resource management. There is not any single standard that can be suggested to apply in constructing dams because geography, climate and socio-economic conditions vary from country to country. The proponents of large dams argue in favour of dams for poverty alleviation and economic growth at national levels. The critics oppose construction of large dams on grounds of environmental hazards and socio-economic losses for the affected communities resulting due to mass-displacements and modification of river flows.

Building dams is capital-intensive not only in construction terms but also in terms of financing environmental assessments and social resettlement costs. It was not until the 19th century that the indigenous and tribal communities affected by dam-construction were recognized as 'involuntary resettlers.' In the post-World War-II period, the cost-benefit analysis of dam-building began involving many of the aspects related to environment, ecology, resettlement and rehabilitation, riparian relations and water quality. Contemporary world additionally focuses on two important implications of dam-building: 1) cumulative impacts of dams and 2) climate change impacts on water resources.

The regions under study are densely populated. The population is growing fast in the Indus, Ganges-Brahmaputra-Meghna (GBM) and Yangtze basins. The population growth rate recorded for the Indus Basin is highest as compared to other regional basins under study (Table 1). This has led to an overarching pressure for continuous water supply to meet ongoing development needs (in India and China) and to begin addressing development challenges (in the case of Pakistan). The three countries are commonly vulnerable to floods and landslide hazards besides facing quality deterioration problem in their

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respective river basins. Equal is the state of governance systems in India, Pakistan and China, which lack transparency over issues of water development and management. In terms of economic growth, the three countries differ from each other remarkably and this stands out as the biggest factor in planning water resources development. Based on the purchasing power parity, China with US$ 8, 390 has the highest rate of gross national income (GNI) per capita in the region followed by India with US$3,590 GNI and Pakistan standing third with only US$2, 870 GNI for the year 2011.[(1)]

Table 1

Population density and annual population growth in study regions

Regions	River Basins	Shared by number of countries	Basin Population (millions)	Basin Annual Population growth (1995-2005)
South Asia	GBM	5	630	2.02 %
South Asia	Indus	4	300	2.83 %
China	Yellow River	1	185.3	0.87 %
	Yangtze	1	378.4	0. 58%
	Pearl	3	92.5	1.23 %
	Red	3	27.8	1.59 %

Sources: AQUASTAT – FAO,[(2)] Olli Varis, et.al.[(3)]

Dam-building in the Himalayas faces high risks of environmental hazards including catastrophic failures and glacial lake outburst floods as the region is located in an active seismic zone.[(4)] China and India are two big neighbouring countries of Pakistan involved in ambitiously planning and constructing new water reservoirs in their territories. In spite of the opposition of local, regional and international environmentalists, the two emerging economies are fully set to address the domestic energy and water supply shortages by constructing a series of dams. The 12th Five Year Plan (2011-2015) of China proposes to add an additional 140 gigawatts (GWs) to the current 230 GWs of hydropower capacity. China has embarked upon a hydropower development programme as a renewable source of energy to meet commitments of cutting carbon emissions by up to 45 per cent by 2020.[(5)] However, according to the environmentalists, sedimentation in the reservoirs is itself a big cause for greenhouse gas emissions.

The paper seeks to evaluate the characteristics of dam-building drive in India and China by reviewing their respective policies and practices. It focuses on some important questions: How varied is the response of the two countries with respect to ecological and socio-environmental impacts of dams? Do the development benefits of dam outweigh its social and environmental costs? What are the lessons that Pakistan can learn from the Indian and Chinese commitment to reservoir planning and construction? The paper is a non-technical attempt to learn lessons from the emerging socio-economic merits and demerits as well as environmental implications of dam-building in India and China. The purpose of this study is to suggest a departure from history by highlighting alternative

approaches in dam construction and investment decisions for the planners and policymakers of Pakistan. The study recognizes important hydrological facts for the Indus Basin and emphasises informed risk assessments in constructing some of the proposed dams in Pakistan. It also stresses the need to encourage well-informed water management decisions with few socio-environmental risks.

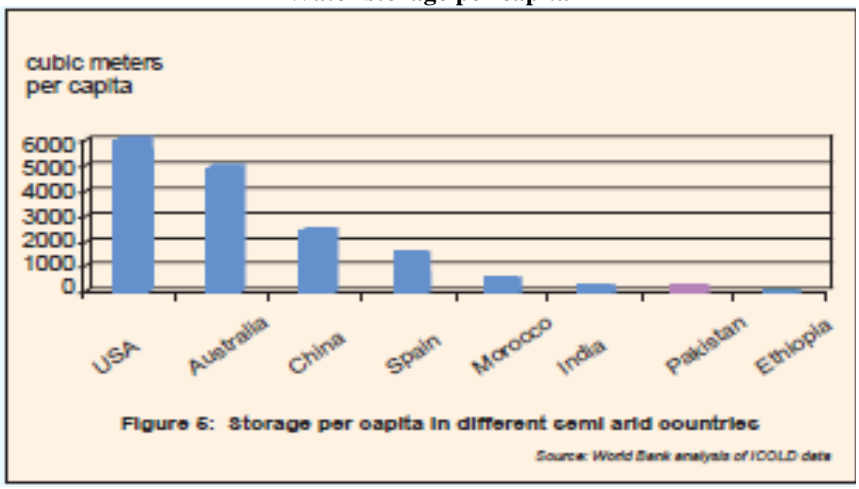
Introduction

India and China are two most active countries in the world in terms of the number of dams in operation, under-construction and planned. The primary objectives of dam-building include irrigation, flood control and hydropower generation. However, the principal motivation behind mega-dam projects in both India and China is the push for economic development which they equate with large water reservoirs and high level of hydropower generation. This is simply following in the footsteps of America and Europe where similar level of mega-engineering took place in the first part of the 20th century.

China has the per capita water storage of more than 2,000 cubic metres through dams. India has a per capita storage of only 200 cubic metres per annum while the figures for Pakistan are even much lower. (Figure 1).[6] China and India both are heavily criticised by the environmentalists and human rights defenders within as well as outside the region for ecological losses and large human displacements that the dam construction activity involves. China with 22,000 large dams[7] is the top dam-building nation in the world whereas India is a distant third in the row with over 4,000 large dams only after the United States having 6,390 large dams.[8] According to the National Energy Statistics, China's 230 GW of installed hydropower capacity make it the world's largest hydropower user.[9] Four countries — China, India, the United States and Pakistan — account for more than 50 per cent of the world's total irrigated area (Figure 2).[10] China and India account for the largest number of people displaced due to dam construction.[11]

Figure 1

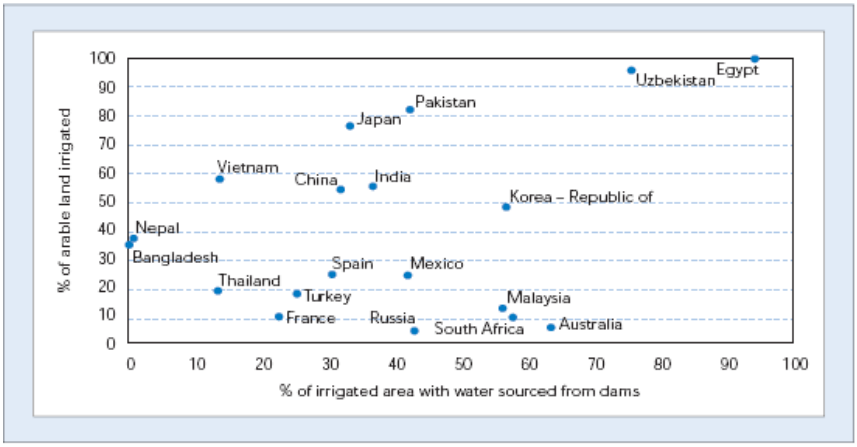
Water storage per capita



Source: World Bank, 2006.[12]

Figure 2

Percentage of dam-irrigated area



Source: World Commission on Dams, 2000.[13]

Construction of water reservoirs, especially large dams,* became the central source of industrial and agricultural development worldwide in the last

There are a number of definitions of large dams. The International Commission on Large Dams (ICLOD) uses the criterion of 'height' as defining a small, medium or large dam. A dam higher than 15m is classified as a large dam. Many others refer to the gross Storage capacity of a dam and foundation design as a basis for the classification of the dams. The ICLOD definition is used worldwide to define the size of a dam. For a detailed report on the

century. According to the World Commission Report on Dams, besides domestic and industrial benefits of dams, some 30-40 per cent of irrigated land worldwide now relies on dams and that dams generate 19 per cent of world electricity.(14) However, higher temperatures and receding snowlines are increasingly reducing flows in the world basins. Less available water means declined capacity for irrigation, energy generation and domestic consumption. Climate change is challenging mega-dam projects. Scientists have begun questioning the utility of big dams with such weather extremes as flood in one year followed by drought the next year. The rate of evaporation of water stored in reservoirs is also predicted to increase with the warming up of global climate. It is not only environment that pays the price for mega water projects. Mass human displacements, loss of ecological habitat, huge investments and riparian conflicts are some of the major costs of dam-building. It has recently become an important consideration in developing countries including India and China to mitigate these costs at least at the national level. Genuine concerns for cross-border or international implications of dam-building have a low priority in both the countries. One of the most important lessons that the two case studies provide to Pakistan is that in order to achieve sustainable water resource development, dam-building should become only a part of an integrated water management policy.

Pakistan has a poor economy. As a single basin country with fast growing population, its water needs for domestic, industrial and irrigation purposes are multiplying every year with huge pressure on limited water resources. The Indus Basin is well-known for its flow dependency on rain and glacial-melt water. New scientific investigations have indicated vast differences in glacial change behaviour across the Himalayas. While glaciers for many of the Indian and Chinese river basins are retreating fast, contributing to rapid seasonal flows, glaciers feeding the Upper Indus Basin are in fact expanding in mass under climate change influence. The dearth of information and research on changing flow trends in the Indus Basin warrants careful planning in proposing and constructing any new storage reservoirs. Dam-building is not only about investment and engineering options, operational issues such as reservoir safety, emergency preparedness and seasonal management call for well-informed decision-making.

Dams and development: A case study of China

China has nine river basins (Figure 3) with varied hydrological quantity and quality. China is not a water-scarce country but water availability per capita is increasingly falling from 2,195 m^3 (cubic metres) in 2000 to estimated projections of 1,760 m^3 in 2030.(15)

China has long been facing the problem of water imbalances in the form of an arid North and flooded South. The country has faced worst floods in

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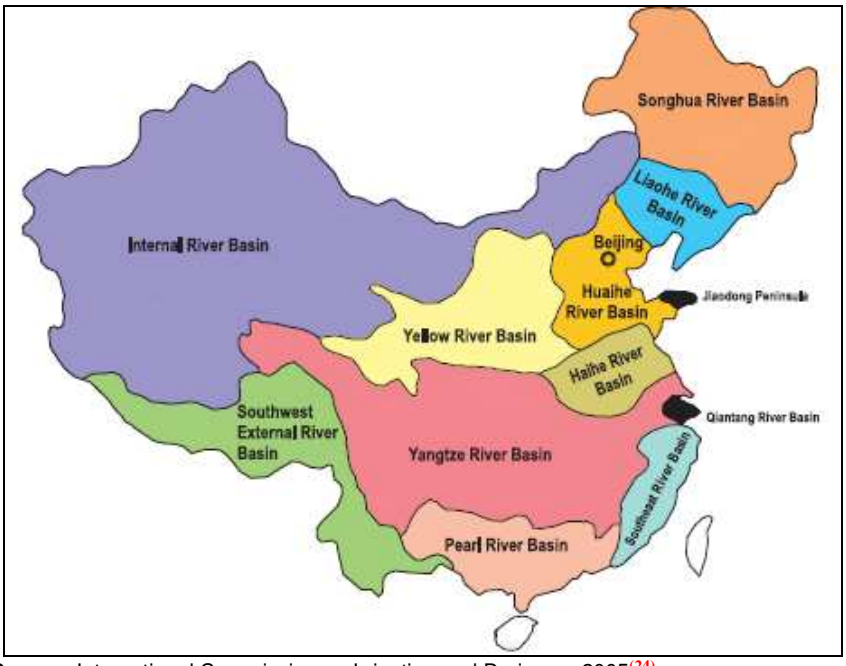
definition of large dams, see Shah and Dinesh Kumar. “In the Midst of the Large Dam Controversy: Objectives, Criteria for Assessing Large Water Storages in the Developing World,” *Water Resource Management*, 2008, No. 22, pp. 1799–1824.

the past including the floods in 1930, 1939 and 1959 that respectively claimed 3.7 million, half a million and 2 million lives across the nation.[16] The extensive drought episodes in northern China have affected economic growth and food security to a large extent. According to Zhang Jiatuan, of China's State Flood Control and Drought Relief Agency, since the 1990s, losses from drought have been equivalent to 1.1 per cent of China's average annual gross domestic product (GDP), or about 300 billion yuan (US$41 billion).[17] Over-pumping of groundwater with a combination of reduced rainfall has also led to water scarcity in the relatively water-rich areas of the country. In 2007, a severe drought left over a million people short of drinking water in southern China.[18] Climate change is making the matters worse. Many of Chinese rivers depend upon glacial melt and rainfall for their annual flows which are threatened by a rise in temperatures. According to the Ministry of Water Resources of China, the country suffers from a shortfall of nearly 40 billion cubic metres of water a year, largely because of global climate change. Rainfall in northern China is decreasing and resources in the watersheds surrounding the Yellow River, Huai He and Liao He (rivers) has dropped by 12 per cent over the past decade.[19] Large-scale urbanization and expanding infrastructure need sustainable water supply in China. Indeed it is the growing Chinese economy that has been the driving force behind dam-building initiatives on a large scale.

It is in this background that central governments in China stick to water conservation policies through mega dams and water transfer projects. The Ministry of Water Resources[20] identifies three problems/reasons for the greater need to protect/conserve national water resources. These include: 1) floods and waterlogging, 2) drought and water shortage, and 3) water environment deterioration. These problems provide a good raison d'être for the Chinese Government to upgrade and build water infrastructure in the country. China's hydropower expansion is an essential part of its strategy to reduce carbon emissions from energy generation sources. China is the world's largest CO_2 emitter due to its heavy reliance on coal, which is a very carbon-intensive fuel and constituted 76.5 per cent of total energy production in the country in 2010. The ratio of hydropower composition to the total energy production remained 9.4 per cent for the same year.[21] China wants to increase the share of non-fossil sources in the energy mix. To serve the dual purpose of increasing power supply and reducing carbon emissions, China has announced an increase in non-fossil sources to 15 per cent of the energy mix by 2020, to 20 per cent by 2030 and to one-third by 2050.[22] China leads the world with 212 GW of installed hydroelectric capacity, followed by Brazil (82.2 GW), the United States (79 GW), Canada (76.4 GW) and Russia (46 GW).[23] Mega-dam projects are planned basins wide to achieve this objective.

Figure 3

River basins of China



Source: International Commission on Irrigation and Drainage, 2005[24]

History of dam-building in China: From past to present

China has 2000 years of history in dam-building. One of the oldest dams constructed in southwest China 2200 years ago is the Dujiangyan, which is in operation to date for flood control and irrigation.[25]

Before 1949, there were only 22 large dams in China. Dam-building has gained momentum since the 1950s[26] to meet the irrigation, energy and water supply needs of the growing population. During 1958-1960, the Communist Party of China actively promoted dam construction as a national campaign. This campaign equated the goal of *harnessing water* with *harnessing people*, which resulted in a nation-wide enterprise for reservoirs construction.[27] At the height of the Great Leap Forward, central authorities used the motto of collective development at all costs to advocate a nationwide dam-building campaign. By 1985, the state-organized campaigns for electricity, irrigation, and flood control succeeded in building 70,000 dams and 80,000 reservoirs. By 1992, when the Three Gorges Project was approved for construction, China already had 369 large reservoirs.[28]

In the Yangtze River basin, more than 45,700 dams with 220.0 billion m^3 of total capacity have been constructed.[29] According to the statistics, by

2002 nearly 34 large reservoirs had been built or were under construction on the upper reaches of the Yangtze River (URYR), and more than 30 large reservoirs had been designed and set up with a total storage capacity of about 200 billion m^3. By 2020, the layout of major reservoirs will be basically completed in the Yangtze River basin. With the gradual implementation of hydropower planning, total reservoir storage capacity in the URYR (upper reaches of the Yangtze River or referring to the Jinsha River — Yichang section) will be 61 per cent of the total river runoff. According to the plans, most rivers in the area of mainstream of the upper Yangtze reaches will be covered by reservoirs.[30] Sharing the large untapped water resources of the Mekong with its south-east neighbours (Cambodia, Laos, Thailand, Myanmar and Vietnam) China has 17-19 hydropower projects in operation, under-construction or under-consideration in the upper Mekong.[31] A large number of the dams recently built or planned are multipurpose in nature and have capacity for flood control and energy generation.

The installed hydropower capacity accounts for about 24 per cent of the total power capacity with annual generation making up 14.8 per cent of the total. According to the China Electricity Council, the country's hydropower investment reached 44.4 billion yuan ($7 billion) in the first five months of the year 2012, up nearly 50 per cent year-on-year.[32] Earlier reports said China is working on hydropower units with a record capacity of more than 1 million kW, expected to be put into service by 2020.[33] China's 230 GW of installed hydropower capacity make it the world's largest hydroelectric power user, according to statistics released by the National Energy Administration in April.[34]

Rural hydropower development has recently become an important focus for policymakers. As of the end of 2011, there were some 45,151 hydropower projects with 62 GW of installed capacity operating in China's rural areas. To improve the management system of the hydropower industry, 120 rural hydropower associations were set up in the country, among which nine are at provincial level, and 111 at city or county level. Computer technology has also been applied in the construction of rural hydropower stations, as automatic operation was realized in 752 unattended hydropower stations. Equal attention has been paid to the small-scale hydropower industry in China half of which is located in Yunnan, Sichuan, Guangdong and Fujian provinces.[35]

Known/assessed impacts of dam-building in China

Several dams built in China in the past are socially and environmentally unsuccessful. Recently, the government started focusing more on environmental aspects of dam-building. Three tasks have been identified by the Communist Party, i.e. building dams with more economic and energy benefits while protecting environment and relocating people more successfully.

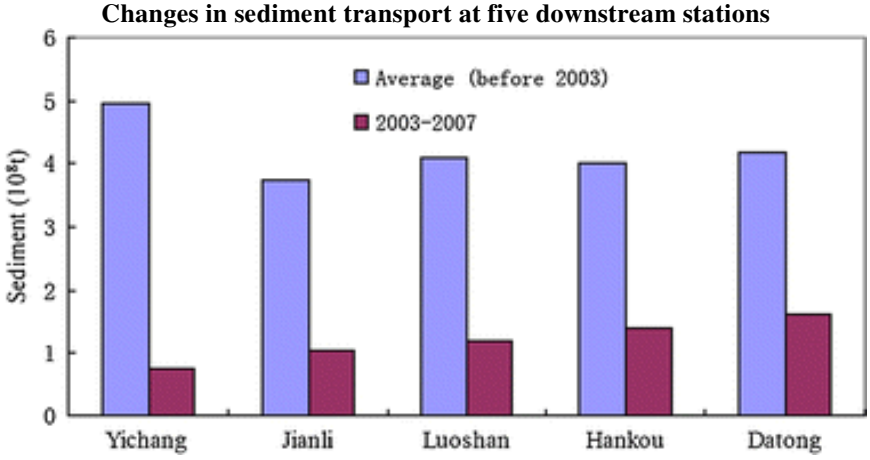
Environmental impacts

On the one hand, the Three Gorges Dam (TGD) reduced the frequency of major floods downstream and on the other hand its operation began to affect hydrological processes downstream. Several studies have found a relationship between sediment decrease and reservoirs construction on major rivers of China including the Pearl River,[36] Yellow River[37] and Yangtze River.[38]

When the TGD started operating in 2003, the Yangtze downstream entered a stage of sediment reduction. During the first two years of impoundment (2003–2004), sediment discharge at Yichang (first station downstream the dam) decreased by 164 million tons.[39] Figure 4 presents the changes of sediment transport compared with that before the operation of the TGD at five major monitoring stations downstream the dam from 2003 to 2007.[40]

Figure 4

Changes in sediment transport at five downstream stations



Source: Zhandong Sun, et.al., 2012.[41]

Another major impact investigated in the TGD downstream area is the effect on ecological habitat due to the seasonal reduction of water levels for the period 2006-2010. The serious droughts that hit downstream Dongting Lake wetlands have been attributed to prolonged periods of extreme low water levels.[42] The project has also increased the earthquake and landslide risks in the region.[43]

On 18 May 2011, Wen Jiabao, Premier of the State Council of the People's Republic of China, passed the "Three Gorges Post-Project Plan" and "Water Pollution Control Plan for the Middle and Lower Reaches of the Yangtze River." The first plan recognises that while the project has brought multi-purpose benefits including to hydropower, flood control and shipping, it has given rise to numerous problems including resettlement, environmental and geological hazards, negative impacts on irrigation and water supply in the middle and lower reaches of the Yangtze River. The Three Gorges Post-Project

Plan seeks to mitigate project's socio-economic and environmental hazards in the basin area.[44]

A number of environmental impacts are also investigated for the South-North Water Transfer Project (SNWT) of China. Some of the potential impacts studied in the Western route area include reduction in power generation capacity for the downstream hydropower dams, the disruption of ecological integrity in the headwaters regions of the Yangtze, Yellow and other rivers involved in the diversion project and finally the seismic and landslide hazards. Wastewater treatment is an important concern along the diversion channels in SNWT. For the two other Eastern and Central routes, potential effect of industrial and agriculture run-off on water quality has been the most significant concern.[45] Dam construction by China in the Mekong Basin has also altered the natural fish migration patterns. Of the eight cascade dams, the Mengsong Dam, in planning, is considered the biggest threat to migratory fish from the Lower Mekong.[46] This will not only change the ecological environment of the Mekong region but will negatively affect the economic structure of the society as fishing is a significant source of livelihood in the Mekong region. The Pearl basin, covered by the third longest river of China, has been studied widely for a decrease in sediment flux due to deposition in the reservoirs.[47] China is known for most dam-break failures in the world with 2900 dam-breaks occurring in the country since 1954.[48] Dam-break failures including natural landslides and manmade breakouts have resulted in huge human and animal casualties and loss of infrastructure facilities.

Socio-economic impacts

Social impact analysis doesn't get much attention in feasibility reports on Chinese dams. Like many other projects, the Three Gorges Project also remains focused on resettlement and livelihood programme — building houses for the migrants and providing them compensations to begin a new life. However, the potential social impacts such as loss of cultural heritages, gender imbalances, problem of harmonization with other ethnic communities, change in socio-economic status due to migration, loss of employment have not been given specific consideration by the dam-building authorities.[49] The Project's 185-metre dam and 600-sq km reservoir have forced the relocation of at least 1.3 million residents.[50] However, the project besides generating large units of hydroelectricity has also increased water flow levels, easing the severe shortages in rice-growing areas downstream.[51]

The rural economies of China are paying huge socio-economic costs for the hydropower stations constructed and being planned on free-flowing rivers. One of the examples is the Manwan Dam (1500 MW) constructed by China on the Upper Mekong River in 1996. Among the significant impacts of Manwan Dam for the village communities are a decline in agriculture productivity and animal husbandry, shortages of water for irrigation, increasing costs for electricity, and depletion of forest resources.[52] The 21-GW (gigawatts) Three Gorges Project alone led to the displacement of over 1.3 million people in

the reservoir area. This number will continue to increase due to the risk of landslides caused by the gigantic hydropower project.[53]

For the Central route of the SNWT project of China, relocation of more than 300,000 people has become an important socio-economic issue.[54] According to the Chinese environmentalist Yu Xiaogang, to mitigate social impacts of dam-building, affected people could be made shareholders in the dam company. Their participation will contribute to local development with reduced social impact.[55]

International impacts

About 112 international rivers and lakes cross China involving 17 riparian countries. Yet the country does not have any single agreement with co-riparian countries on water regulation, sharing or management. Out of the 15 most important international rivers crossing the country, 12 originate in China making it the most important upstream country in Asia and the world.[56] The last decade showed a growing debate on the China's unprecedented hydropower development on international rivers and their environmental impact in downstream countries.

Cross-border water conflicts have begun surfacing over China's relations with neighbouring countries in relation to water sharing in the Mekong, Irrawaddy, Salween and Paunglaung[57] and Brahmaputra rivers. With a cascade of dams planned and being constructed by China in Upper Mekong (UM) from where 30 per cent of dry season flows originate,[58] hydrological alterations by the reservoirs will result in serious social, economic and ecological hazards for the 60 million people living downstream along the Lower Mekong (LM). The Chinese dams in UM are also projected to affect the operation of 12 proposed dams in LM. According to the scientific statistics, more than 50 per cent of total basin sediment load in the Mekong will be trapped annually by the construction of eight Chinese dams upstream.[59]

The Mekong's hydrological regime has been significantly altered by the Lancang-Jiang cascade. The dry season hydrological changes are significant in all downstream gauging stations as far as Cambodia. The Lancang-Jiang series of dams (including the construction of eight dams on the mainstream of Upper Mekong Basin) by China may significantly alter the socio-economic status of people living downstream as far as Cambodia where the major livelihood source is fish and agriculture. Any major change in water quality or quantity is intrinsically linked to the lifecycle of ecological habitat with positive and negative effects for human beings.[60]

The fact that one or more dams with multi-season regulating capacity reservoirs in lower Mekong-Lancang, Yangtze and Salween rivers raised downstream concerns regarding changes in flow regimes led China to construct the last dam on the Yunnan cascade, Ganlanba, as a counter-regulating dam between large upstream dams and downstream water users. However, according to reports, the Ganlanba has improved navigation as the only downstream benefit.[61] India has been much furious since the revelation of Chinese plans to build hydropower reservoirs on the Brahmaputra River.

China's international policy regarding water management is discreet and self-guarded. With Mekong countries, China's relationship is limited to less sensitive issues. On the inter-governmental Mekong River Commission (MRC), China maintains only the observer status. With Kazakhstan, China has signed an agreement on water quality in Irtysh River in February 2011.[(62)] China also has a joint project on the Tumen River Economic Development Programme with South Korea, Mongolia and Russia. China's selective level of engagement with neighbouring riparian countries and continued secrecy regarding data sharing on flow volumes, sediment transport, etc., have not only reinforced the perception about China's 'go it alone' policy[(63)] on major international rivers but have also strengthened the suspicion that China lacks the spirit behind widely shared sub-regional goals on poverty alleviation, increased access to reliable energy supply and sustainable environmental development.

Policy response by China

Resettlement Policy and pollution control are the two biggest areas addressed by the Chinese Government in an attempt to reduce environmental and socio-economic hazards resulting from dam-building spree in the country.

The government has started showing increased interest in understanding the environmental impacts of water resources conservation in domestic as well as in international river basins. As for example, to maintain water quality in the central channel of South-North Water Transfer Project, several measures have been undertaken to ensure that the Danjiangkou reservoir will be "a reservoir of clean water to send to Beijing" by constructing an ecological forest preserve of some 356,667 ha (881,342 acres) around the reservoir; establishing erosion control measures in the area surrounding the reservoir; and shutting down more than 800 small but heavily polluting businesses in the area.[(64)]

A number of scientific studies have also been supported by the government on water resources development in international rivers. Some of these include "Integrated Allocation of Trans-boundary Water Resources in Lancang River Basin", "Reasonable Allocation of Sharing Water Resources in Northwest China", and "Foreign Policies of International Rivers in China."[(65)] Besides supporting academic research on water resources, the Chinese government is also active in capacity-building for engineers, practitioners and researchers in the field of water resource development and management.

In 1981, the country's Reservoir Resettlement Law was promulgated which created a "reservoir maintenance fund" to divert money from the hydropower industry for poverty relief among many of the displaced people in the countryside. Under this law, hydropower stations were required to allocate 0.001 yuan per kilowatt hour of electricity they generated for funding projects designed to improve the living conditions of reservoir resettlers. The widely popular policy of the Chinese government promoted by the early 1990s in reservoirs areas was the introduction of developmental resettlement policy. This policy incorporated local economic development into resettlement plans. Specifically, the approval of construction funds is made contingent upon plans

made by project administrators and local governments to utilize part of the resettlement investment to improve economic conditions in reservoir areas or at resettlement sites elsewhere.[66] People get monetary compensation from the dam-building companies and relocate. The government provides social security to all those who lose their livelihoods as a result of relocation. But the major issue for people relocating to other areas is the loss of their social and economic capital including culture, natural resources, traditional bonds and their forefathers' lands. To date, people are paying the price for China's growing water economy needs. It will take another decade to measure the benefits of national economic development for the public at grass-root levels.

The dam-building industry in China suffers from lack of integration between various sectors for water demand management. China is located in a geographical zone seriously affected by climate change impacts. Huge investments in mega-dam projects are able to prevent floods, reduce carbon emissions besides generating energy for the massively growing industries of China but the question of sustainability arises in the wake of visible climate changes. This is a question mark that how long could the dam-industry of China support the fast-melting glaciers on the one hand and extreme dry spells on the other? Water conservation through massive financial investments needs to be well supported by water preservation policies in order to integrate the whole water management industry.

Dams and development: A case study of India

India has 12 major and 46 medium river basins (Figure 5).[67] However the country is water-stressed due to the progressive reduction in per capita water availability, which was estimated at 1545 cubic metres in the 2011 census.[68] The live storage capacity of India is 253 billion cubic metres (BCM) and per capita water storage capacity is 209m^3.[69] Due to spatial and seasonal variations in river flows, floods and droughts are a common phenomenon in the country. India has long been facing weather extremes with rainfall as low as 150mm per year in Rajasthan to as high as 10,000 mm in the northeast hills.[70] Nearly 12 per cent of the total geographical area of the country is flood prone while 16 per cent is drought prone.[71] The Indus, Mahi and Sabarmati basins are physically water scarce whereas those of the Brahmaputra, Ganga, Meghna and Barak are rich in water resources. Food security has become an important concern given the growing population of the country. However like China, there is a growing competition in India between irrigation and industry in increasing water demands.

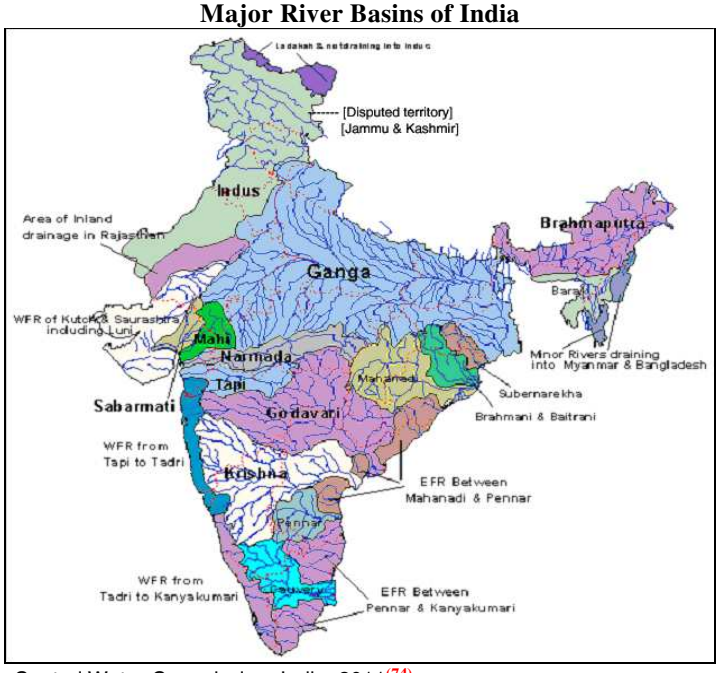
India ranks fourth in the world after China, the USA and Russia in building the greatest number of dams. The rising economy of India requires water for growing irrigation, power for expanding industries and infrastructure for flood control. Like China, the drive for national development has been the main factor behind dam-building in India. This is reflected through the statements of Indian leaders as speaking to those displaced by Hirakud Dam in 1948, the then prime minister, Jawaharlal Nehru, resonated, "If you are to suffer,

you should suffer in the interest of the country." According to the estimates of the year 2012, India has a total storage capacity of 225.14 BCM. Storages for 63.89 BCM are under construction and storages for another 107.54 BCM are under consideration. The expected storage capacity after the completion of planned projects is 396.57 BCM against the total availability of 1869.35 BCM of water in the river basins of India.[72]

The two main sources of freshwater in India are rainfall and glacial melt which are erratic in terms of space and timing. It is for this reason that the National Water Policy, 2002, recognised inter-basin transfer of waters as one of the important non-conventional ideas to augment the availability of water for growing needs. A revised version of the National Water Policy (June 2012) elucidating the importance of climate change recognizes the need for an evaluation of economic, social and environmental impacts of inter-basin transfers.[73]

Figure 5

Major River Basins of India



Source: Central Water Commission, India, 2011[74]

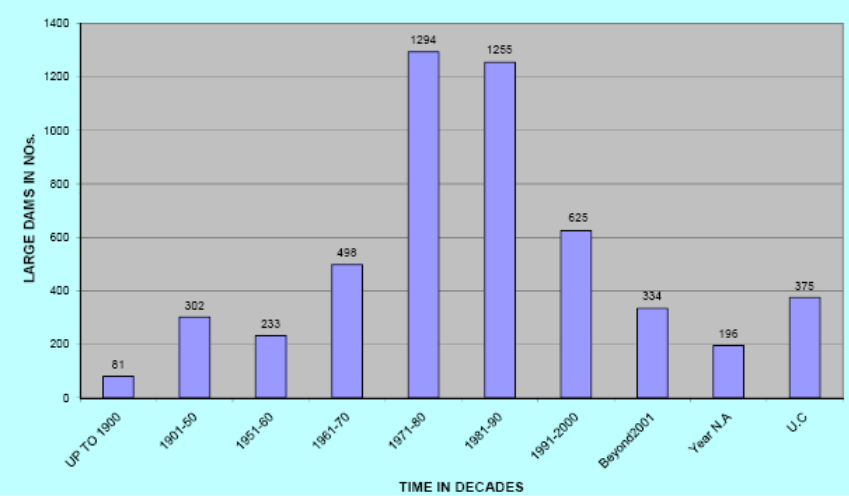
History of dam-building in India: From past to present

Up to 1900, India had only 81 large dams. This number grew to 496 by 1970. The largest number of dams, i.e. 1294, was built between 1970 and 1980 (Figure 6). By 2012, India completed 4,818 large dams in the country. Those which are under construction number 375.[75] This figure is exclusive of medium

and small dams under construction in different basins in the country. In the Brahmaputra basin alone, India is reportedly constructing 200 large and small dams in the state of Arunachal Pradesh.[76] Before independence in 1947, India had only 30 dams exceeding 30 metres as most dams were less than 15-20 metres high.[77] The construction of high dams especially for hydropower generation began in the post-independence period including the Hirakud, Gandhi Sagar, Bhakra Nangal, Pong and Damodar Valley dams as massive projects of the government of India. Dams with a height between 100 and 200m are 20 in number. Only the Bhakra-Nangal Project in Punjab and Tehri Dam in Uttaranchal state are above 200 m. The Indira Sagar Project in Madhya Pradesh state, completed in 2006, is the largest dam built in India to date. Only the Sardar Sarovar dam is going to be the next in terms of size.[78] This was only in the last decade that the government embarked upon an ambitious plan of adding 50,000MW of hydropower to the national energy sector by 2025. The Central Electricity Authority of India has proposed 168 large hydroelectric projects with a total installed capacity of 63,328MW in the Northeast alone.[79]

Figure 6

Distribution of large dams in India — decade-wise



Source: National Register of Large Dams, India, 2012.[80]

Until the last decade, dams in India were mainly planned and built to serve the major purpose of irrigation. Even for the multipurpose projects, irrigation was the main consideration. Hydropower and flood control were largely the secondary but related objectives. However, recently a number of dam projects have begun surfacing in Indian policy planning particularly for energy generation. About two-thirds of the installed hydropower capacity in the country is attributed to storage-backed schemes (i.e., dams) and one-third comes from run-of-the-river schemes.[81] According to the estimates of the Indian Ministry of Water Resources, out of the estimated 84,000MW potential of hydroelectric

power, the current installed capacity is about 13,000 MW. Nearly 6,000MW projects are under construction and 3,000MW is expected from the projects already cleared. This will provide India 22,000MW of hydroelectric power once the projects under consideration and under construction are completed.[82] The 50,000MW initiative of the government announced in 2003 envisages the construction of 162 new hydropower schemes by 2017. This will be followed by adding another 67,000 MW of hydropower in the next 10 years.[83]

Dams have contributed to the development and modernization of irrigated agriculture in India. The Bhakra Dam alone added an irrigated area of 6.8 million hectares over 35 years.[84] By 2000, dam-irrigated area in the country accounted for 35 per cent of total irrigated area.[85] A fourfold increase in the gross irrigated area from 1951 to 1997 has been estimated due to dam-based canal irrigation. However, the actual contribution of dams to food production in this period is less than 10 per cent.[86] Critics of large dams attribute surplus food production in India to many other factors including the use of better fertilizers and chemicals, multi-cropping, improved quality of seeds, etc. However, it cannot be denied that a number of the dam projects in India have positively contributed to irrigation and flood control objectives. Multipurpose reservoirs such as Damodar Valley Dams (Tilaiya Dam 1953, Maithon Dam 1957 and Panchet Dam 1959), Beas, Hirakud, Ukai, Bhakra, Chambal and Nagarjunsagar dams have played a role in resolving flood problem downstream.[87]

Climate change is worsening the water security situation in India. A study by the Kathmandu-based International Centre for Integrated Mountain Development (ICIMOD) says the frequency of floods and flashfloods in the state of Arunachal Pradesh has increased in the last 20 years. Arunachal Pradesh, through which the Brahmaputra flows and where many of Assam's major rivers originate, received 22 per cent excess rain in 2012. This flood situation was in sharp contrast to the previous year's (2011) rainfall deficit in the state.[88]

Known/assessed impacts of dam-building in India

The history of reservoir construction in India is replete with poor water governance, lack of environmental concerns, massive human displacements and inter- and intra-state disputes. The National Water Policy, 2012, recognises that "water resources projects are being planned and implemented in a fragmented manner without giving due consideration to optimum utilization, environmental sustainability and holistic benefit to the people."[89] It is for this reason that integrated water resources development and management has recently become the primary focus of the national water mission in the country.

Socio-economic impacts

Initially dams were mainly aimed at supporting irrigation. The Bhakra Dam constructed on the Sutlej in India in 1963 is as famous as the Tarbela Dam on the Indus in Pakistan for heralding green revolution in the divided

subcontinent. According to the National Council of Applied Economic Research, India, "The Bhakra Dam alone added an irrigated area of 6.8 million hectares over 35 years. The production of rice and wheat in the Bhakra command area during 1996-97 was 8 times" the figure for 1960-61.(90)

Other than that of human displacements, social impacts of dams in India are largely underreported. One major social and environmental impact recognised by a study on dams in Northeast India is the loss of resources under common use such as pasture land.(91) Some important downstream impacts of the dams investigated in Northeast India include loss of fisheries; changes in wetland ecology in the floodplains; impacts on agriculture in riverine islands and tracts; impacts on various other livelihoods due to blockage of rivers by dams (for example, driftwood collection, sand, and gravel mining); increased flood vulnerability due to massive boulder extraction from riverbeds for dam construction and sudden water releases from reservoirs in the monsoons and dam safety and associated risks in this geologically fragile and seismically active region.(92) The influx of economic migrants* for dam construction activities disturbing the socio-economic and political balance of the culturally rich regions such as Sikkim is reportedly one major impact of dam-building in Northeast India.(93)

In India, displacement has another face affecting the lives of those who are already marginalized in society. They include women, Dalits (Scheduled Castes) and Scheduled Tribes. Protest movements against big dams have a strong history in India. One of the longest anti-dam struggles in India is known as Narmada Bachao Andolan –NBA (Save the Narmada Movement) which has been using public pressure to force policymakers to abandon plans for damming the Narmada basin.+ These anti-dam movements have played a great role in raising awareness about socio-economic vulnerabilities of those displaced by reservoir construction.

It is largely due to lack of planning and failure of impact evaluation agencies that at times people have to be resettled twice as a result of dam-building. The case of Tehri dam (2005) is an example where people were uprooted from their lands twice owing to the submergence of the old town of Tehri by the reservoir. However, the resettlement and rehabilitation programme was largely successful in the case of Tehri dam where a whole new city of Tehri was created for 110 displaced villages. Some of the positive socio-economic impacts of Tehri Dam include the creation of new infrastructure facilities,

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* To protect culture and resources of the State, the Sikkim Government prohibits the settlement of non-indigenous people in the Dzongu areas, inhabited by the old Lepcha community.

+ This is the fifth largest river in India. The government of India plans to build 31 large, 135 medium and 3,000 small dams in the Narmada Basin. The idea of damming the Narmada dates back to 1947-48. The basin is shared by three states of India - Gujarat, Maharashtra and Madhya Pradesh. Full development of the basin was envisaged to secure irrigation and drinking water and electricity for the dry and energy-short regions in three riparian and one non-riparian state, i.e. Rajasthan. "Large Dams on the Narmada River," *Friends of River Narmada*. <http://www.narmada.org/index.html>

improving status of women in the relocated rural communities, better access to education and water and energy outputs. The negative socio-economic impacts of the dam included few employment opportunities, problem with rehabilitation choices* and loss of religious and cultural connectivity.(94) Likewise, for the Sardar Sarovar Project (also known as the Narmada Valley Project), issues arose regarding the treatment with project oustees. The rehabilitation package gave rise to new disputes as many displaced people preferred cash to land and there were also allegations against the state of Madhya Pradesh over not providing land in compensation in compliance with the Narmada Water Disputes Tribunal (NWDT) Award.(95) In fact the major issue that appeared during the legal battles between the NBA and the state authorities in the Supreme Court of India was the false claim by the state of Maharashtra over land availability for rehabilitation of affected families by adding 5 metres to the height of the Sardar Sarovar Dam. The planned height of the dam is 138 metres and the legal battle surrounds the debate that given the unavailability of land for rehabilitation of families affected with the current height of 90 metres, the number of people displaced with the planned height will be 320,000, making rehabilitation impossible due to the non-availability of land.(96)

A review of literature on impacts of water development projects record in India shows that the largest socio-economic impact of dam-building in the country has been in terms of delayed rehabilitation and disgruntled resettlers. Conditioned by the bureaucratic and muddled system of governance, the project authorities always seemed to be interested in physical transfer of people from the project location to another land without due concern for their livelihood and welfare.(97) A large number of the people thus displaced include tribal or indigenous (*Adivasi*) communities.(98) Their main source of livelihood consists of forests, pasture lands and common property resources which were submerged by reservoirs such as Tehri, Sardar Sarovar and Narmada Sagar dams, to name a few. Even with cash compensations, most of these tribal people were marginalized due to lack of professional skills and few livelihood choices. Another major problem mentioned in the literature on economic impacts of dam-building in the country is the loss of economic survival opportunities for landless people in the post-displacement period.(99) The rehabilitation policy of the Indian Government recognizes compensation only for the loss of asset/land. Therefore the landless people become real destitute by losing their earlier economic activity in the process of relocation.

Environmental impacts

Nearly all the dam projects have negative environmental and ecological effects by submerging forests, grazing lands and by reducing fisheries in the

* The rehabilitation package consisted of cash or land in lieu of displacement. On the one hand, people in many cases were not satisfied with the compensation packages. The government on the other hand recorded that more and more people filed claims for compensation for their displacement on one pretext or the other. See, *Impact of Tehri Dam*: *Lessons Learnt*, Water for Welfare Secretariat, Indian Institute of Technology, Roorkee, February 2008, p.10.

naturally flowing rivers. This is a case like environment versus development. The Damodar River (also known as "River of Sorrow") was the first basin selected by the government of India as early as 1947 for flood control projects considering its seasonal flooding. The five reservoirs (four were constructed during 1953-1959 and one in 1978) built on the Damodar and its tributaries tangibly moderated the flood flows to the extent of 53 to 80 per cent in the high flood years.[100] However, these reservoirs have created a more worsening flood situation downstream in the lower valley of the Damodar as due to the decrease in channel capacity,* even a lower-level flood is anticipated as a big problem in the lower Damodar River.[101]

The diverted flow of Ranganadi River by the construction of 405MW Rangandai hydropower project (RHEP), Stage I, in Arunachal Pradesh has affected the aquatic life and tourism downstream. Mining and pollution due to dam-construction activities are also serious threats to the ecology of regions like Sikkim and Arunachal Pradesh which are rich in biodiversity.[102] The Brahmaputra carries the second largest sediment yield in the world and traverses through the regions identified for seismic activities. The gigantic plans for the construction of dams/run-of-the-river projects in basins such as the Brahmaputra carry environmental risks not only for development projects such as glacial lake outburst floods and landslides but are also a recipe for ecological disaster by disturbing the natural water balance and releasing environmentally dangerous gases such as methane. Flow fluctuations in the Brahmaputra tributaries such as the Subansiri, Siang, Lohit and Dibang rivers through a series of dams will reportedly impact breeding grounds of important flora fauna species in the large forest area of the region. Besides, it would negatively affect the biodiversity of national parks such as Dibru-Saikhowa and Kaziranga in Northeast India.[103] Mega-dams in Northeast India, which is proposed to serve as the powerhouse of the country, are promoted to seek carbon credits. However, most mega-dam projects in India have been criticized at national and international levels for lack of compliance with environmental standards. According to report of the World Commission on Dams, instead of environmental impact studies being done before approval of the projects under the Sardar Sarovar Project, "they were done concurrently with construction, an approach that undermines the very basis of environmental planning."[104] The construction of Nathpa Jhakri's India, largest hydropower station with 1,500MW capacity on the Satluj, faced repeated halts (from 1993 to 2004) by the Ministry of Forest and Environment due to project authorities' continuous violation of the Forest Conservation Act and the Environment Act. The project was approved by the World Bank much before the actual environmental appraisal.[105]

The earlier culture of lack of consultation with the dam oustees is really changing with people's movements raising environmental awareness at national, regional and international levels against ill-conceived development projects. Some of these movements have been successful while others failed to achieve

* The Lower Damodar in general and its lower section in particular has risen owing to increase in siltation and encroachments on the riverbed. This has reduced the carrying capacity of the channel downstream.

the desired results. The Silent Valley Hydroelectric Project (1973), proposed to be constructed on the Kuntipuzha River of Kerala's Palghat district, home to an evergreen rainforest, was abandoned due to massive public protests to save the world's richest biological and generic heritages in the valley.[106] Forced by the persistent opposition of the indigenous communities in the state of Sikkim to the proposed dams on the Teesta River, the state government has cancelled the construction of 10 dams, with the recent four cancelled as recently as June 2012.[107]

The Tehri hydroelectric project (1978) was opposed by environmentalists both for its negative socio-economic and environmental impacts* on the region. However, even after 17 years (1978-1995) of legal and emotional battle with the government, the popular movements failed to halt the Tehri Dam project. The Polavaram Project in the Godavari Basin in the state of Andhra Pradesh was delayed for a number of years on environmental accounts. The project has the potential to irrigate large tracts of land, provide drinking water to 3 million people and supply 23,500 million cubic feet of water to industries. However, its estimated submergence of nearly 10,000 acres of forestland and threat to the flora and fauna in Andhra Pradesh, Chhattisgarh and Orissa [108] became primary reasons for public opposition and protests against its construction.

In recent years, the Narmada Valley Project has become famous for mass public protests against the negative environmental and ecological effects of damming the sacred river of Narmada. Proposed to be completed by 2040, the project would rank as the largest irrigation project ever planned and implemented as a single unit anywhere in the world.[109] However, the project poses serious environmental dangers as it seeks to submerge a vast area of forestland. The state of Madhya Pradesh has lost 32 sq km of forest cover due to dams especially on the Narmada River. The state boasts the largest forest cover in India.[110] Nearly all environmental clearances of the development projects undertaking deforestation require appropriate afforestation compensation. But the implementation of such legal environmental requirements often remains a challenge even after the commissioning of the project.

Whether successful or failed, mass movements have historically influenced the legal and policy aspects of environment and development. It is for this reason that today all the dam projects need to get environmental clearance before proceeding ahead with any construction activity. But there is no denying the fact that environmental assessment for development projects is still in a nascent state in India.

International impacts

According to the *International River Basin Register*, of Oregon State University, India shares 7 international river basins in the world.[111] India shares a greater number of rivers with Bangladesh than with any other country in the region. More than 140 common water systems have been identified for the two

* The region of Tehri is vulnerable to earthquakes and landslides.

countries and are grouped under three international river basins — the Fenney, the Ganges-Brahmaputra-Meghna, and the Karnaphuli.[112] Therefore, widespread economic, environmental and political impacts are natural in the region due to India's construction of mega-dams in massive numbers. India has a number of agreements on sharing and regulation of common water resources with its riparian neighbours. Still, the damming of common rivers has resulted in large-scale regional opposition. Pakistan and Bangladesh are the two regional riparian countries that have shown much resistance to Indian dams upstream their river tributaries due to the negative downstream effects on irrigation, local livelihoods, ecology and overall environment. Pakistan has sought legal adjudication for two — Baglihar and Kishanganga — out of several disputes on India's construction of dams on shared tributaries of the Indus River. With more than 33 projects at various stages of completion[113] and nearly 190 hydropower schemes identified[114] by India on various tributaries of the Indus Basin, Pakistan being a lower riparian is apprehensive of their cumulative impacts on the seasonal and timely flows for its own irrigation and energy projects. India's proposed dams on the Teesta River have been a sore point in its bilateral relations with Bangladesh. More than 30 dams, barrages and diversions constructed upstream in India, Nepal and Bhutan have reduced dry-season flows in Bangladesh up to 60 per cent.[115] The construction of the Tipaimukh dam on Barak River in Manipur (100 km from the border of Bangladesh) is contested between the two for its ecological and reduced flow effects on irrigation, fisheries, drinking water supply, navigation, and groundwater levels in bordering villages of Bangladesh.[116] India has recently assured Bangladesh of not undertaking any project upstream that may have negative downstream effects for Bangladesh.[117]

Nepal, although an upper riparian neighbour, is equally disturbed owing to the bad effects of the dams built by India on common rivers in the past. Dams built by India on tributaries of Mahakali, Gandak and Kosi have raised inundation issues on the Nepalese side. Even many non-concrete dams including Bagmati, Khurdlotan, Mahalisagar, and Laxmanpur are said to have resulted in waterlogging, submergence of agriculture lands and displacement of people in border areas of Nepal.[118] Many other big projects proposed by India in Nepal have long been delayed due to internal opposition in Nepal against selling out national interests to the co-riparian. Acute dissatisfaction exists in Nepal for India's past record of unilateral decisions and actions to build structures on the common rivers of the Ganges-Brahmaputra Basin. The major concern of the Nepalese government is to get an assured equitable share in perceived benefits (energy generation, irrigation, flood control) of dam-building with minimized losses upstream.

The Indian project of river interlinking (IRL) — proposed in 1980 and revised recurrently with the recent drive in 2012 — in the Ganges and the Brahmaputra basins has invited much regional uproar as neither Bangladesh nor Bhutan and Nepal were formally consulted as lower and upper riparian countries, respectively. The plan to transfer surplus or flooded waters of the Ganges and Brahmaputra envisages construction of several large dams and

structures in Nepal and Bhutan. These structures, if built, would have the potential to cause several environmental effects such as increasing inundation problems in the southern lowlands of Nepal and submergence of land in areas of Nepal bordering India.[119] Bangladesh as a lower riparian country is afraid of reduced water flows. The proposed IRL project through the diversion of water by 12 upstream Indian dams may also result in increased sedimentation in downstream rivers of Bangladesh.[120] Moreover, 72 dams proposed to be built in Northeast India gave rise to due concerns in Bangladesh for their ecological, environmental and economic consequences on the Meghna River Basin which is an important source for fisheries, tea gardens, irrigation and wetlands in Bangladesh.[121]

It is only Bhutan that has kept silent to date about the negative environmental and ecological effects of the IRL project largely because of two reasons. One, due to India's heavy involvement in developing Bhutan's water resources and investing in large hydropower structures on the latter's territory; and two, Bhutan's large revenues earned from hydroelectricity being sold to India.

India has always been opposed to trilateral or regional approach to water management. The historical record of Indian dam-building on international rivers shows that India has adopted opposite attitudes with its upstream and downstream riparian neighbours. With upstream riparian neighbours — China, Bhutan and Nepal — India has been following the negotiating policy of 'equitable water security' while with downstream riparian neighbours — Pakistan and Bangladesh — it has been resorting to the doctrine of 'necessity" in proposing major dam projects. There is also a small power- big power aspect to the debate of dam-building on international rivers. With relatively weak upstream riparian neighbours (Bhutan and Nepal), India, as a big regional power, has been forging bilateral water security relationships by investing in water infrastructures across the borders. Whereas with China, a powerful upstream riparian, India is critical of its dam-building impacts on the ecology and environment of the shared rivers. For the small riparian neighbours, India advocates the policy of bilateralism to maintain its supremacy over shared river waters; and for the big riparian neighbour, India has now started talking about waters in Tibet as a 'commons'[122] to build affected countries alliance against China. This should be noted here that instead of a multilateral treaty there are two different bilateral treaties vis-à-vis the Ganges River for which India, Bangladesh and Nepal are co-riparian countries. China is the only left-out riparian of the Ganges River having no treaty with co-riparian countries. India is both an upper and lower riparian for the Ganges River but for the same river waters, India has concluded two agreements — the Mahakali Treaty with Nepal and the Ganges Treaty with Bangladesh. The lack of basin-wide approach to water management issues in South Asia only leads to the complicated and artificial crisis of shared water resources.

Policy response by India

In recent years, two aspects of dam-building have started widely influencing public policy regarding any new dam project in India. These include socio-economic constancy (balance between rehabilitation costs and project benefits) and environmental concerns. With almost 60 million people displaced since 1947, India has the highest number of human displacement for development projects in the world. However, only a third of these people were resettled in a planned manner.[123] The National Resettlement and Rehabilitation Policy (2007) requires any new project to go through Social Impact Assessment (SIA) before its commencement.[124] The provision of SIA has also been introduced as an important part of the Land Acquisition Bill 2012.[125] Through the process of decentralization, the rehabilitation policies have been adopted by many states in India. The state of Gujarat has further liberalised its policies by purchasing the land identified by the dam oustee and allotting it to him/her.[126] However, there is still no economic and social recovery assessment practice regarding the resettled people post-rehabilitation, a factor seriously undermining the success of mega-projects proposals in India.

Water has been a state-subject in India but in recent decades, the Centre's ability to influence the planning and implementation of projects has been increased to some extent under several laws and policy frameworks introduced. These include Environment Protection Act, 1986, Forest Conservation Act, 1980, Wild Life (Protection) Act, 1972, and the Water (Prevention and Control of Pollution) Act, 1974. The states' proposed dam projects need to get clearances from the Central Government under all these Acts and this has strengthened public power against many of the large dam projects with massive socio-environmental impacts. The rise of public interest litigation has become an important legal tool for the project-affected people.

Another important change in recent years is the wide acceptance of the concept of impact-mitigation to become a part of project planning and construction activity in India. The issue of rehabilitation has become more pronounced as compared to the old focus on mere resettlement of the people displaced by dams. In some of the recent dam projects, more comprehensive rehabilitation packages were introduced. For example, the Tribunal established under the Inter-State Water Disputes Act for the Sardar Sarovar Dam decided land-for-land compensation to the displaced. There has also been an emphasized focus in National Water Policy drafts of 2002 and 2012 on people's participation in project planning and development. However, what is lacking on ground is the issue of sustainability with regard to the management of water resources. Both the National Water Policies, 2002,[127] and 2012 have been criticized for their inherent deficiencies regarding sustainability of water resource policies. These policies also suffer from lack of institutionalization of multi-sectoral cooperation over water use.

The importance of basin-wide (or sub-basin) planning was recognized as early as the 1950s with the Central Water Commission's assessment of resources and identification of storage sites in different basins of the country. The River Boards Act was introduced in 1956 in order to set up advisory river

boards for regulation or development of water resources in a given river basin. It was formally acknowledged through the 1987 National Water Policy document. Bhakra Nangal, Sradar Sarovar and Gandhi Sagar dams are some of the examples for projects undertaken through basin-wide planning. However, inter-disciplinary management of a basin or sub-basin inclusive of development in all sectors ranging from mega-projects, micro-watershed development, environmental, ecological, economic and social development still lacks implementation in India.[128] Similar concerns need to be integrated for planning development on international river basins.

Climate change has recently begun to get a prominent place in national policy documents dealing with the proposals and planning of water reservoirs. In order to avoid large-scale submergence and devastation to fragile ecological areas, most hydropower projects are proposed as run-of-the-river plants. However, a policy response is missing in India regarding the cumulative impacts of run-of-the-river plants on the hydrology of different river basins. Recently, the High Court of the state of Karnataka halted the implementation of a number of mini- and micro-hydel projects in the Western Ghats region of the state pending a cumulative impact assessment.[129] These legal standards however remain missing for nation-wide or region-wide cumulative impacts of dams on river basins in India.

Lessons learned and policy options for Pakistan

Similar to worldwide practice, the regulation of river waters by construction of dams and reservoirs in India and China have primarily been motivated for the provision of hydropower, irrigation, domestic and industrial supply and flood and drought control. By fulfilling these objectives, dams contribute to positive economic gains and national development at the cost of massive negative socio-environmental impacts. For China, social impacts of dams are reported and evaluated scarcely due to the system of governance perceived as less transparent. However, huge criticism exists for the potential environmental consequences of dams-led development within and outside China. This has led to the adoption of policies at the State level for the concurrent mitigation of negative socio-environmental impacts. India has been more open in terms of reporting the negative socio-economic and environmental impacts of dams-led development in the country. In the previous section, the negative and positive outcomes of dams have been described and analysed in detail for India and China. The major objective was to evaluate the approach, attributes and pitfalls in the dam-building inspiration of the two case studies. The development of water conservation projects and management of their negative impacts in India and China share a number of differences and similarities (Table 4). The present section evaluates a number of issues pertinent to reservoir construction in the two countries in an attempt to draw lessons for a developing country like Pakistan.

First of all, domestic circumstances (such as large population, regional imbalance in water distribution, climate change threats, energy shortage and growing water scarcity, etc.) in India and China are similar with respect to the

need for greater number of water conservation projects. However, a number of factors vary considerably in the two countries as regards to dam building. Two major factors include the contrasting systems of governance and divergence in infrastructure resources. All dam projects need to be approved by the Central Government in China whereas in India water is a state subject and the centre gets involved only in mega-projects. The per capita gross domestic product (GDP) of China is two times greater than India's. China is also home to the world's second-largest highway network,[130] an essential resource to support dam-building industry in any country.

The second major issue is of finance. China is a much larger economy than India and most of the dams built in China are being largely funded by revenues from the power industry. More than half of the cost for the Three Gorges Project, world's largest hydroelectric plant till date, was financed by the Chinese government through the principle of equity.* Other sources of funding include massive domestic debt, indirect foreign loans and issuance of domestic as well as international bonds by the government. Due to the controversial nature of the project, foreign direct funding was limited to 5-6 per cent of the total project costs.[131] India is also following in the footsteps of China by depending upon domestic sources to fund mega-projects such as Sardar Sarovar and Maheshwar dams after being denied foreign loans from World Bank and other international contractors in 1990s[132] on socio-environmental grounds. Large economy and diverse financial resources have allowed China to not only fund the rehabilitation process but also to invest in ecological restoration and reforestation projects.

The third issue is related to environmental policies and regulations for dam construction and resettlement issues. The Chinese Government has a strict policy for protecting cultivated land in order to control the total amount and percentage of land used for construction to curb the unjustified appropriation of farmland.[133] A number of policy plans and projects (e.g. National Plan for Sand Prevention and Control (2005-2010), water and soil conservation projects, water pollution control projects, National Programme for Wetland Protection Engineering (2002-2030) and Action Plan for Biodiversity Conservation)[134] are underway in China to mitigate the negative impacts of dam and other projects on environment and ecology in the country elsewhere. The central government spent 233.2 billion yuan (more than 30 billion US dollars) on the 27.7 million hectares of new forests planted from 1999 to 2009.[135] The total output value of China's environment industry in 2010 was equivalent to about 139.7 billion US dollars[136] against Chinese investment worth 54.75 billion US dollars in water conservation projects in 2011.[137] In India, besides many individual states' policies on water and environment, a number of central government laws regulate dam-related issues including River Boards Act, 1956, Inter-State River Water Disputes Act, 1956, Water (Prevention and Control of Pollution) Act, 1974, National Water Policy, 2002, National Wildlife Action Plan (2002-2016), National Environment Policy, 2006, National Resettlement and Rehabilitation

* Equity was realized through a nation-wide levy on the electricity price, contributions from several budgets and profit from the Gezhouba power plant.

Policy, 2007, National Action Plan on Climate Change, 2008, etc. Both India and China are, however, increasingly facing the issues of implementation in compliance with international standards on environment and water management.

The fourth issue is of resettlement and rehabilitation work. Both India and China are highly focused on mitigating the negative socio-environmental effects on dam-displaced population. China has been providing 600 Yuan ($96.55) a year as a follow-up subsidy to each reservoir resettlement migrant since 1 July 2006. The subsidy is set to last 20 years.[138] The decentralized system of rehabilitation and compensation payments in India is marred by gross inequalities and complicated legal issues regarding land allotments between various states. Differences between states' policies concerning mode of compensation for dam oustees have delayed rehabilitation in many dam projects in India.

Fifthly, India and China are identified as major global hotspots for climate change worst implications for water resources. Climate change threats for these two countries include shortage of water, sea level rise, extreme weather events, increase in natural disasters and shrinkage of arable land. China has been working to reduce the risk of decreasing grain harvests caused by global warming in the coming decades.[139] China has done far better than India in the Clean Development Mechanism (CDM) scheme and has overtaken India in 2007 as the world's biggest beneficiary of CDM. Till late August 2011, India had 719 CDM projects having been registered by the CDM EB, accounting for about 21 per cent of the world's total 3,427 projects registered with the CDM EB, following China with 46 per cent.[140] In 2007, China made more money than any other country out of rich-world polluters — $5.4 billion, or 73 per cent of the total. India, which, along with Brazil came second, made $445m — 6 per cent of the total.[141] India and China are competitors in better focusing their national policies vis-à-vis climate change programme.

Table 2

A comparative assessment for dam building in India and China

Similarities	Differences
Chronic imbalance between population density and water availability in different regions of both countries.	Centralization of water resource management in China, while in India water management is a state subject.
Both suffer from frequent floods and droughts.	India has signed a number of water treaties with its riparian neighbours. China has no water treaty with any of its riparian neighbours.
Reduced per capita water availability.	Dam-building in India is vulnerable to NGOs opposition and public protests on socio-environmental grounds. China is less transparent and open both for dam-building plans and to public opposition.
Dismal record with rehabilitation issues for the displaced people.	As compared to India, China is more successful in financing the resettlement costs.[142]
China and India both have outstanding disputes with their lower and upper riparian neighbours for reservoir construction on shared river	China is not only self-financing the construction of dams within the country but also serves as a major

basins.	funder for dam-building around the world. India largely relies on foreign loans to finance its dam projects.
Shortage of electricity — therefore both have an increased focus on augmenting hydropower.	
New water policies of the two countries are better focused on addressing social and environmental concerns regarding dams under construction and dams awaiting pre- feasibility studies.	
No stakeholder consultation takes place in either country for a dam project.	
Increased water pollution.	
Lack of integration between various water sectors within the dam-building industry.	
Increased role for private sector in financing and constructing dam projects.	
Unsatisfactory environmental impact assessments (EIAs) by the agencies concerned.	
Time and cost overruns for large projects.	
Climate change impacts in terms of glacial melt and GLOFs are equally established for the water resources of the two countries.	

Sources: International Rivers Network, HRI China (hrichina.org), AQUASTAT FAO, World Bank and earlier cited literature in the case studies.

Lessons for Pakistan

Pakistan shares a number of similarities with India and China in terms of water scarcity, population increase, energy shortage, and weather extremes. However, unlike India and China, Pakistan has only one river basin, which is shared by India under the Indus Waters Treaty, 1960. Any massive future uses by Afghanistan on the Kabul River, a tributary of the Indus basin, will also affect the availability of water for proposed mega-projects in Pakistan.

Besides learning some of the good practices from India and China, Pakistan needs to take cognizance of the fact that the geological and climatic responses to the hydrological resources of Pakistan vary considerably from that of these two countries. In contrast to many of the Himalayan glaciers feeding the river basins of India and China, where there is significant evidence of glacial retreat[143] (and upcoming threats of reduced flows), glaciers of the Upper Indus Basin (UIB) are not retreating and many in the Karakorams are in fact increasing in mass.[144] Most of the glacial melt-waters in the Indus Basin actually go to the sea because of timing — coinciding with the monsoons. Therefore, it makes good sense to store the glacier waters behind dams for multiple uses throughout the year by effectively dealing with the expenses, dangers and inefficiencies involved in dams' construction.* Since runoff trends in the Indus basin vary spatially and seasonally, seasonal flow assessments,

* Email conversation on 12 January 2013 with Kenneth Hewitt, a glaciologist associated with Wilfrid Laurier University, Canada.

besides comparative evaluation of runoff trends at different stations, will be of substantial value[145] in planning and designing reservoirs with better response to climate change variability.

The case studies done above provide the following significant lessons for Pakistan:

- Building a dam with uncertain climate change implications and natural disaster risks, is like a case "Damned (or dammed!) if you do and damned if you don't."[+] Urgent considerations should be given in Pakistan to new storages both at micro — and macro-levels besides improving water use efficiency by managing the demand side. With a population growth rate of 2.05 per cent and an annual addition of 3 million persons,[146] there will be an inevitable rise in water demand in Pakistan in the coming years. A huge supply crisis is predicted for the drought years with the current storage capacity of Pakistan too scanty to even support the existing irrigation needs of the country.
- Renovation of old projects such as the Mangla Dam Raising Project and Tarbela 4th Extension Project is currently underway with the financial assistance of the World Bank. The Chinese experts have rejected the option of de-silting the Tarbela reservoir to increase its storage capacity. According to the feasibility study, massive financing required to remove silt and rock deposits from the dam is almost equal to the cost of a new dam.[147] The Tarbela Dam will itself complete its lifespan of 50 years by 2029. After the completion of 1,450MW Ghazi Barotha project in 2004, a gap of nine years is tremendous enough to demonstrate the lack of efforts for new reservoir projects in Pakistan. It takes more than a decade between a final decision for dam construction and its coming into operation. In order to increase the per capita storage capacity, new dams are necessary to be planned on fast-track basis.
- Maximum funds should be generated from within the country to support the renovation of old reservoirs and construction of new ones. Additional levies should be placed on irrigation and energy sectors to increase the revenue for infrastructure purposes. The Chinese model of self-financing the resettlement costs should be especially exemplary for policymakers in Pakistan. To meet this objective, primary consideration must be given to stakeholder consultation, community participation and partnership with the private sector. Moreover, delays in projects like that in the Neelum-Jhelum hydropower project. cause huge cost overruns (Rs15

[+] Email conversation (on 10 January 2013) with David Archer, a hydrologist based at New Castle University, USA

billion in 1989 to Rs333 billion in 2011).[148] Planning based on domestic funds and resources could solve such issues in the future.

- Legal framework and regulations on dam-related issues are scant in Pakistan. The draft prepared for national resettlement policy in March 2002 has never been approved and the old Land Acquisition Act, 1894, has been the most commonly used law for development projects which does not cover resettlement and rehabilitation issues. The practical record of compensation payments, relocation and rehabilitation of dam-displaced communities is also poor in Pakistan. People displaced by the two large reservoir projects — of the country -Tarbela and Mangla dams — still recall the stories of broken promises and socio-economic impacts of displacement. There is an urgent need to formulate updated versions of national resettlement policy and land acquisition act in Pakistan in view of the much desired water resources development/management.
- Environmental impact assessments (EIAs) and safety measurements for dam-burst events and earthquake risks should become an important part of any proposed dam project. Both India and China have been unsuccessful in the actual implementation of EIAs for their reservoir development plans. This has led to domestic and international opposition for many of the projects in the two countries following with the withdrawal of multilateral funding and construction companies from some of the projects as well as cancellation of others on environmental grounds. The proposed site for the Diamer-Bhasha dam in Pakistan is reportedly seismically active. Significant concerns should be raised in the country about the geo-hazard questions regarding infrastructure as well as preparedness and the safety of people in Gilgit-Baltistan. Recently, more than 340 large landslides have been identified along the Indus streams in the Karakoram, Hindu Kush and northwest Himalayan ranges.[149] This calls for a careful approach and perhaps revision of the proposed construction of dams in high mountains (Diamer-Bhasha) due to the geo-hazards involved.
- Like China, Pakistan could increasingly focus on run-of-the-river (ROR) hydropower plants with few submergence and displacement issues. The Ghazi Barotha Hydropower Project on the Indus, completed in 2004 with loans from Japan and the World Bank, is a good example with relocation of only 1,000 families.[150] However, the cumulative effect of many ROR projects on a single river may result in drying up for longer spells during the time of diversions. Therefore these projects

may also cause significant environmental harm if undertaken without an independent environmental assessment.

- Another important lesson is to improve coordination between various water sectors. The current water stress in Pakistan is related to both demand and supply management. Climate change has replaced the past slogan of water resource development with water resource management and this warrants local adaptation initiatives in areas ranging from household consumption and irrigation to industrial uses. To meet the water demands for irrigation, energy, environment and industry, a broader strategy of water-environment relationship is required. Restraining the demand side by an increase in water usage efficiency is equally important besides supply projects for water conservation. Therefore alternative water conservation strategies should be pursued simultaneously and huge water structures should only be opted as a last resort* through an integrated water policy.
- The Tribunal established under the Inter-State Water Disputes Act for the Sardar Sarovar Dam in India presents a test case for the controversial Kalabagh dam in Pakistan which has been delayed for more than 25 years due to the water-sharing disputes between the provinces. The Pakistan Water Apportionment Accord was promulgated in 1991 to apportion the share of water to the four provinces from canal supplies. The accord does not deal with any water conflicts arising between the provinces which is a major hindrance to new development projects in the country. It also lacks enforcement mechanism to distribute water share as per the 1991 Agreement.(151) A legal framework on inter-provincial water disputes is earnestly desired in Pakistan with the power of judicial tribunals to resolve such inter-provincial differences as the one between Punjab, supporting the construction of Kalabagh dam, and the rest of the provinces opposing the construction of the proposed dam.
- Other lessons learned include the possibility to reduce the socio-environmental impacts to manageable levels through practical measures such as community consultation, rigorous evaluation of alternatives (including dam design, funding sources, technology required, land acquisition, compensation methods, etc.), stakeholder/beneficiary involvement in financing the project, awareness raising, reforestation and re-plantation, promoting good water use practices as demand management.

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* Personal conversation with Ramaswami Iyer, a Delhi-based writer and former secretary, Water Resources, Government of India.

Conclusions

Dam-building stands as an important national water development strategy around the world. While the benefits of dam construction are realized at national scale, most of their costs including loss of livelihoods, problems in cultural adaptation, gender imbalances due to relocation of the residents, reduced water flows for irrigation, depreciated water quality and loss of ecological habitat are borne by people living in the reservoir area. In the case of international rivers, geo-political tensions are some of the negative impacts associated with dam-building. Dam debate is not merely about good or bad, small or large, but it is all about planning and management.

The downstream impacts of dams range from dam-break floods and reduced seasonal flows to quality deterioration of water. There have been regional level demands in India for completing the cumulative impact study in advance for projects proposed on the Teesta River and Brahmaputra floodplains.[152] Recently, geological concerns have begun to emerge regarding building of dams in seismic- and landslide-prone areas. In China, such concerns have been expressed for dams on the Nu River (known as the Salween River when enters Myanmar), for dams on Brahmaputra River in Northeast India and for the Diamer-Bhasha Dam on the Indus River in Pakistan. Global warming is also affecting the glacial mass and rain patterns. Modern sciences have found a relationship between large reservoirs and an increase in rainfall intensifying the flood season. Investigating the rain patterns around water bodies in Chile, scientists found that rains were much higher there than in similar areas without them.[153] The "lake effect" could be measured for the reservoirs built without taking the evaporation factor into consideration. To date, no serious study has been undertaken in the Himalayan or Tibet region for socio-economic impacts of large dams under climate change.

Funding for dams has been a major issue in developing countries. China has self-financed the world's largest hydropower project – the Three Gorges Dam (1850 MW) — as in Chinese view, the project would have cost 10 times more with foreign loans. The primary claim of generating cheap electricity by building mega-dams is thus practically achieved by China. This spirit of nationalism needs to be sought through in Pakistan before embarking upon large water development projects.

While India, Pakistan and China face similar kind of challenges with regard to development needs and associated environmental, political and socio-economic costs of dam-building, the three countries remarkably differ from each other in terms of economic growth and water governance institutions. India has a much progressive history in adopting resettlement policy. Maharashtra, which has the largest number of dams in the country, was the first state in India to formulate a resettlement policy in 1976.[154] However there have been gaps in implementing the policy on the ground nationwide. The record of resettlement and rehabilitation is relatively poor in India than that in China. There are three main lessons that policy sections in Pakistan must learn and adapt accordingly in planning and constructing any large reservoir in the country.

- Consultation with the affected people/stakeholders of the project.
- Short- and long-term policy implementation plan for the effective resettlement and rehabilitation of the people displaced.
- Pre-proposal advanced level studies to anticipate and mitigate environmental impacts of a given project and disbursement of data.

The biggest irony is that local communities are seldom consulted during the planning and feasibility study of a proposed reservoir. The bureaucratic culture of hiding facts and lack of consultation with the stakeholders in the developing countries largely affects an integrated development plan for water resources.

The scientific basis for planning development of the river basins is equally poor in India, Pakistan and China. In India and Pakistan, water management is done through sector- wise administrations/ministries which have conflicting interests. Without giving due consideration to the impacts of these inter-linkages between multiple water sectors, it would be naïve to fully estimate the costs and benefits of dam projects. In the developed world, mega-dams are beginning to be seen as obsolete solutions for water management problems. The raising of the Tarbela Dam is a good example as the topographical constraints limit the possibility of having good storage sites. Therefore it is important to preserve the live storage capacity of the existing reservoirs as much as possible.[155]

There is a limit to which the hydropower or multipurpose dams could be built on a river basin. This is true that environment and culture become remote considerations when questions of sustenance and survival come in. But there is no end to alternative methods of development. The need is to better understand the interrelationships between population, resources, environment and development through quantitative and qualitative models of assessment.[156] As the illuminating new book *Energise*, by James Woudhuysen and James Kaplinsky, points out, dams are what we make of them. Loss of wildlife, the generation of greenhouse gases and even resettlement are a small price to pay compared with the benefits of a dam – if they are well planned and run.[157]

Any statement unconditionally supporting or opposing the construction of dams need to be based on ground realities. Dam-building can only become an essential part of large developmental goals by having due respect for ecological, social, economic and political ethos in a given society. Dams should only be built by considering the integrity of a river basin and various water sectors at the national level and legitimate needs of the riparian states. A basin-wide approach must be the basis of any water management or development policy.

Notes and References

1. *Data for GNI per capita PPP*, Washington: The World Bank, 2011. <http://data.worldbank.org/indicator/NY.GNP.PCAP.PP.CD>, (accessed on 14 February 2013).
2. FAO-Aquastat, Indus River Basin, Food and Agricultural Organisation of the United Nations, 2011. <http://www.fao.org/nr/water/aquastat/basins/indus/index.stm>, (accessed on 10 March 2013).
3. Olli Varis, Matti Kummu, Aura Salmivaara, "Ten major rivers in monsoon Asia-Pacific: An assessment of vulnerability," *Applied Geography*, No.32, 2012, pp.441-454.
4. Shripad Dharmadhikary, *Mountains of Concrete*, International Rivers: California, 2008, p.3.
5. "China sets first targets to curb world's largest carbon footprint," *The Guardian*, 26 November 2009. <http://www.guardian.co.uk/environment/2009/nov/26/china-targets-cut-carbon-footprint>.
6. World Bank, *Better Management of Indus Basin Waters: Strategic Issues and Challenges*. South Asia Region, Agriculture and Rural Development Unit, Washington DC, 2005.
7. China is the country with the largest number of reservoirs in the world. However, the estimates vary from regional to international organisations. According to Chinese National Committee on Large Dams, China has built 87,000 reservoirs, all types, by the end of 2006, of which more than 500 are large reservoirs, more than 3,200 medium-sized reservoirs, and about 83,300 small reservoirs. Zhao Chun, Jia Jinsheng, Zheng Cuiying, Xia Lianqiang, Wenpeng, *Management System Development of Dangerous Reservoirs in China & Preliminary Statistics Analysis of Distress Causes*, Beijing: Chinese National Committee on Large Dams (CHINCOLD), (accessed on 26 March 2012) The World Commission on Dams Report, 2000, estimates the total number of dams in China at 22,000.
8. World Commission on Dams, *Dams and Development: A New Framework for Decision Making*, London: Earthscan Publications Ltd, 2000, p.9.
9. "China sets 2012 hydropower target for rural areas," *Interfax China*, 7 June 2012. <http://www.interfax.cn/news/20356>, (accessed on 19 November 2012)
10. World Commission on Dams, op.cit., (ref.8), p.13.
11. Ibid., p.17.
12. *Better Management of Indus Basin Waters — Strategic Issues and Challenges*, Islamabad, World Bank, 2006. <http://siteresources.worldbank.org/INTPAKISTAN/Data%20and%20Reference/20805819/Brief-Indus-Basin-Water.pdf>, (accessed on 8 March 2013)
13. World Commission on Dams, op.cit., (ref.8), p.13.
14. Ibid., p.xxix.
15. China: Lower water availability and uneven distribution of water. *Global Water Partnership China*, <http://www.gwp.org/en/gwp-in-action/China/>, (accessed on 08 December 2012).
16. Peter H. Gleick, "China and Water," in Peter H. Gleick, Heather Colley, Michael J. Cohen, Mari Morikawa, Jason Morrison and Meena Palaniappan, (ed.), *The World's Water 2008-2009: The Biennial Report on Freshwater Resources,* Washingon DC: The Pacific Institute for Studies in Development, Environment and Security: 2009, pp. 84-85. <http://www.worldwater.org/data20082009/ch05.pdf>, (accessed on 10 December 2012).
17. Wang Ying, "Drought nationwide problem now," *China Daily*, Beijing, 21 December 2007. <http://www.chinadaily.com.cn/china/2007-12/21/content_6337847.htm>, (accessed on 22 September 2012)

18. "Flooded China warns of heat, drought — and snow?," *China Daily*, 2 August 2007. <http://www.chinadaily.com.cn/china/2007-08/02/content_5447658.htm>, (accessed on 22 September 2012)
19. Xie Chuanjiao, "Warming Takes toll on water resources," *China Daily*, 11 May 2007. <http://www.chinadaily.com.cn/china/2007-11/05/content_6229698.htm>, (accessed on 22 September 2012).
20. "Conserving and Protecting Water Resources," *Ministry of Water Resources*, The People's Republic of China. <http://www.mwr.gov.cn/english/cpws.html>, (accessed on 26 March 2012).
21. "Total Production of energy and its composition," *China Statistical Year Book, 2011*, <http://www.stats.gov.cn/tjsj/ndsj/2011/indexeh.htm>, (accessed on 19 August 2012)
22. Gang Chen, *China's Climate Policy*, Volume 24 of China Policy Series, New York: Routledge, 2012, p.61.
23. "Report says worldwide development of hydroelectric power slow in 2011," *Hydroworld.com*, Washington DC, 13 February 2013. <http://www.hydroworld.com/articles/2013/02/reports-says-worldwide-development-of-hydroelectric-power-slow-i.html>, (accessed on 15 February 2013).
24. "Water Resources Assessment of Qiantang River Basin," China: Country Policy Support Programme (CPSP), New Delhi: International Commission on Irrigation and Drainage, 2005, p. 2. <http://www.icid.org/cpsp_report5_web.pdf>, (accessed on 20 October 2012).
25. Bryan Tilt, Yvonne Braun, Daming He, "Social Impacts of Large Dam Project: A comparison of international case studies and implications for best practice," *Journal of Environmental Management*, Volume 90, July 2009, p.S253. <http://oregonstate.edu/cla/anthropology/sites/default/files/pdf/faculty/tilt/tilt_et_al_sia_dams.pdf>, (accessed on 27 November 2012).
26. Zhang Lubiao, "Social Impacts of Large Dams: The China Case," Thematic Review 1.1, Working paper of the World Commission on Dams. <http://www2.wii.gov.in/eianew/eia/dams%20and%20development/kbase/contrib/opt124.pdf>, (accessed on 27 March 2012).
27. Shui Fu, *A Profile of Dams in China*, 24 October 2007, International Rivers: Berkeley. <http://www.internationalrivers.org/files/attached-files/a_profile_of_dams_in_china.pdf>, (accessed on 10 November 2012).
28. Jin Jung, "Displacement, Resettlement, Rehabilitation, Reparation and Development," China Report, Thematic Review I.3, *World Commission on Dams*, South Africa, 1999, p.4.
29. Zhandong Sun, Qun Huang, Christian Opp, Thomas Hennig and Ulf Marold, "Impacts and Implications of Major Changes Caused by the Three Gorges Dam in the Middle Reaches of the Yangtze River, China, *Water Resources Management*, Springer online, 30 May 2012.
30. Nan Zhang, Hong Mou He, Shao Feng Zhang, Xiao Hui Jiang, Zi Qiang Xia and Feng Huang, "Influence of Reservoir Operation in the Upper Reaches of the Yangtze River (China) on the Inflow and Outflow Regime of the TGR-based on the Improved SWAT Model, *Water Resources Management*, Springer online, November 2011.
31. R Edward Grumbine, John Dore, and Jianchu Xu, "Mekong hydropower: Drivers of change and governance challenges," *Frontiers in Ecological Environment* 2012, Volume 10, No.2, p.91. <http://www.esa.org/pdfs/Grumbine.pdf>, (accessed on 27 November 2012).
32. Liu Yiyu, "Alstom boosts hydropower investment in China," *China Daily*, 02 August 2012. <http://www.chinadaily.com.cn/business/2012-08/02/content_15640371.htm>, (accessed on 19 February 2012).
33. "China completes world's largest hydropower unit," *China Daily*, 13 July 2012. <http://www.chinadaily.com.cn/business/2012-07/13/content_15578435.htm>.
34. "China sets 2012 hydro targets for rural areas," *Interfax China,* 7 June 2012. <http://www.interfax.cn/news/20356>, (accessed on 19 August 2012).

35. *Annual Report, 2007-2008*, Ministry of Water Resources, People's Republic of China, p.29. <http://www.mwr.gov.cn/english/Publications.html>, (accessed on 19 November 2012).
36. Shurong Zhang, Xi Xi Lu, David L. Higgitt, Chen-Tung Arthur Chen, Jingtai Han, Huiguo Sun, "Recent changes of water discharge and sediment load in the Zhujiang (Pearl River) Basin, China," *Global and Planetary Change,* 60, 2008, pp. 365–380. <http://www.mgac.nsysu.edu.tw/ctchen/Publications/A/226.pdf>, (accessed on 20 November 2012).
37. Tao Yang, Qiang Zhang, Yongqin David Chen, Xin Tao, Chong-yu Xu, Xi Chen, "A spatial assessment of hydrologic alteration caused by dam construction in the middle and lower Yellow River, China," *Hydrological Processes*, Volume 22, Issue 18, 30 August 2008, pp.3829–3843.
38. Qiang Zhang, Vijay P. Singh, Xiaohong Chen, "Influence of Three Gorges Dam on stream flow and sediment load of the middle Yangtze River, China," *Stochastic Environmental Research and Risk Assessment*, May 2012, Volume 26, Issue 4, pp.569-579.
39. Kehui Xu, John D. Milliman, "Seasonal Variations of Sediment Discharge from the Yangtze River before and after impoundment of the Three Gorges Dam," *Geomorphology* No. 104, 2009, p.277. <http://ww2.coastal.edu/kxu/Geomorphology09.pdf>, (accessed on 2 July 2012)
40. Zhandong Sun, et al., op.cit., (ref.29), 2012.
41. Ibid.
42. Ibid.
43. "China declares Three Gorges hydro project complete," Reuters, 4 July 2012. <http://www.reuters.com/article/2012/07/04/china-threegorges-idUSL3E8I42ZW20120704>, (accessed on 11 March 2013).
44. The State Council Executive Meeting Discusses and Passes the "Three Gorges Post-Project Plan", Translated by *Probe International*, 18 May 2011. <http://laep.ced.berkeley.edu/3gd/docs/StateCouncil_Mea%20Culpa_2011.pdf>, (accessed on 26 November 2012).
45. Darrin Magee, "Moving the River? China's South–North Water Transfer Project," in Brunn, Stanley D. (Ed.), *Engineering Earth: The Impacts of Mega-engineering Projects*, Netherlands: Springer, 2011, p.1508-1510.
46. Bin Kang, Lisa Perrett, Yungang Li, Daming He, "Are the fish of the upper and lower Mekong interconnected?," *Chinese Journal of Oceanology and Limnology*, Volume 27, Issue 2, May 2009, pp.400-407. <http://lancang-mekong.org/Asian_en/Asian_show_cn.asp?ID=339&classID=131>, (accessed on 17 December 2012).
47. S.B. Dai, S.L. Yang, A.M. Ca, "Impacts of dams on the sediment flux of the Pearl River, southern China," *Catena*, Volume 76, Issue 1, 15 December 2008, pp.36–43. <http://dx.doi.org/10.1016/j.catena.2008.08.004>, (accessed on 7 December 2012).
48. Cui Peng, Han Yongshun, Dang Chao and Chen Xiaoqing, "Formation and Treatment of Landslide Dams Emplaced During the 2008 Wenchuan Earthquake, Sichuan, China," in *Natural and Artificial Rockslide Dams*, Volume 133 of Lecture Notes in Earth Sciences, Berlin: Springer, pp.295-321.
49. Ubiao Zhang, "Social Impacts of Large Dams: The China Case," Thematic Review Paper for Report on Dams and Development, Thematic Review I.1; "Social impact of large dams: Equity and distributional issues," World Commission on Dams, South Africa, 1999, pp.xi-xiii. <http://www.docin.com/p-415031944.html>, (accessed on 4 July 2012).
50. "China declares Three Gorges hydro project complete, op.cit., (ref.43).
51. "Three Gorges Dam determined to rectify financial problems," *China Daily*, 24 May 2011. <http://www.chinadaily.com.cn/cndy/2011-05/24/content_12564883.htm>.
52. Tilt, et.al., op.cit., (ref.25), p.S254.

53. "Three Gorges dam to displace 20,000," Reuters, 18 April 2012. <http://www.iol.co.za/business/international/three-gorges-dam-to-displace-20-000-1.1279105>, (accessed on 27 November 2012).
54. Darrin Magee, op.cit., (ref 45), pp.1508-1510.
55. Prime Sarmiento, "Environment — China: What Makes A Good Dam?," interview with the Chinese environmentalist Yu Xiaogang, *Inter press Service*, 7 September 2009. <www.ipsnews.net/2009/9/>, (accessed on 27 November 2012).
56. He Daming, Zhao Wenjuan, Feng Yan, "Research Progress of International Rivers in China," *Journal of Geographical Sciences*, Volume 14, Issue 1, July 2004, p.22.
57. Panchali Saikia, "China's Longjiang Dam: Concerns for Myanmar," *Eurasia Review and Analysis*, 15 January 2011. <http://www.eurasiareview.com/15012011-china%e2%80%99s-longjiang-dam-concerns-for-myanmar/>, (accessed on 26 November 2012).
58. Grumbine, et.al., op.cit., (ref.31).
59. Matti Kummu, X.X. Lu, J.J. Wang, and Olli Varis, "Basin-wide sediment trapping efficiency of emerging reservoirs along the Mekong," *Geomorphology*, Issue 119, 2010, p.181. <http://www.academia.edu/2289839/Basin-wide_sediment_trapping_efficiency_of_emerging_reservoirs_along_the_Mekong>, (accessed on 28 November 2012).
60. Timo A. Räsänen, Jorma Koponen, Hannu Lauri, Matti Kummu, "Downstream Hydrological Impacts of Hydropower Development in the Upper Mekong Basin, *Water Resources Management*, September 2012, Volume 26, Issue 12, Springer, p.3495.
61. Darrin Magee, "The Dragon Upstream: China's Role in Lancang-Mekong Development," in Joakim Öjendal, Stina Hansson, Sofie Hellberg, (Eds.) *Politics and Development in a Transboundary Watershed: The Case of the Lower Mekong Basin*, The Netherlands: Springer, 2012, p.6.
62. "Parting the Waters," *China Economic Review*, Hong Kong, 1 April 2012. <http://www.chinaeconomicreview.com/node/56995>, (accessed on 10 December 2012).
63. Magee, op.cit, (ref.61), p.21.
64. Ibid., p.1510.
65. He Daming, Zhao Wenjuan, Feng Yan, "Research Progress on International Rivers in China," *Journal of Geographical Sciences*, Volume 14, Issue 1, July 2004, p.25.
66. Jun Jing, "Displacement, Resettlement, Rehabilitation, Reparation and Development — China Report," *Thematic Review I.3*, South Africa: World Commission on Dams, 1999, p.6.
67. "India, Country Paper on Water Security," Central Water Commission, Ministry of Water Resources, Government of India, New Delhi, June 2011, p.1. <http://www.indiaenvironmentportal.org.in/files/file/Water%20Report%20-INDIA.pdf>, (accessed on 10 January 2013).
68. "Per capita water availability," Press Information Bureau, Ministry of Water Resources, Government of India. <http://pib.nic.in/newsite/erelease.aspx?relid=82676>, (accessed on 10 January 2013).
69. "Water Storage Capacity," Press Information Bureau, Ministry of Water Resources, Government of India. <http://pib.nic.in/newsite/erelease.aspx?relid=83836>, (accessed on 10 January 2013).
70. India, AQUASTAT — Food and Agricultural Organisation, "Water Report 37, 2012", <http://www.fao.org/nr/water/aquastat/countries_regions/IND/index.stm>, (accessed on 18 August 2012).
71. "India: Country Paper…," op.cit., (ref.67), p.1.
72. Water and Related Statistics, Chapter 5, *Integrated Hydrological Data book*, Central Water Commission, New Delhi, March 2012, p.45. <http://www.cwc.nic.in/main/webpages/HBA.pdf>, (accessed on 16 February 2013).

73. National Water, Policy, 2002 and National Water Policy 2012, Ministry of Water Resources, Government of India, <http://wrmin.nic.in>, (accessed on 16 February 2013).
74. "India, Country Paper…," op.cit., (ref.67).
75. State-wise distribution of large dams — Abstract, *National Register of Large Dams*, Government of India, 2012. <http://www.indiaenvironmentportal.org.in/files/file/National%20Register%20of%20Large%20Dams%202012.pdf>, (accessed on 27 December 2012).
76. "India speeds up work on 200 dams," *The Asian Age*, New Delhi, 12 February 2013.
77. Ravi Hemadri and Harsh Mander, "Dams, Displacement, Policy and Law in India," Thematic Review 1.3: *Displacement, Resettlement, rehabilitation, reparation and development*, 2000, Cape Town: World Commission on Dams, <http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN021311.pdf>, (accessed on 22 December 2012).
78. Mukuteswara Gopalakrishnan, "Resettlement and Rehabilitation: Lessons from India," In C. Tortajada, et al., (ed.) *Impacts of Large Dams: A Global Assessment*, Water Resources Development and Management, 2012, p.358.
79. Neeraj Vagholikar, "Dams and Environmental Governance in North-east India," in *India Infrastructure Report 2011*. IDFC-Infrastructure Finance Company, Investment Banking and India Infrastructure Development, p.360.
80. State-wise distribution of Large Dams, op.cit., (ref.75).
81. R. Rangachari, Nirmal Sengupta, Ramaswamy R. Iyer, Pranab Banerji, and Shekhar Singh, "Some Agreed Conclusions – Large Dams in India, draft paper for The World Commission on Dams, 2000." (accessed by requesting one of the authors).
82. "Hydroelectric Power," Ministry of Water Resources, Government of India. <http://wrmin.nic.in/index2.asp?sublinkid=407&langid=1&slid=313>, (accessed on 16 February 2013).
83. *Mountains of Concrete: Dam-Building in the Himalayas*, International Rivers, USA, 2008, p.7.
84. "Report on Economic Impact of Interlinking of Rivers Programme," *National Council of Applied Economic Research*, India, April 2008, p.xiii. <http://www.indiaenvironmentportal.org.in/files/99.pdf>, (accessed on 11 July 2011).
85. Esther Duflo and Rohini Pande, "Dams, Centre Discussion Paper No.923," August 2005, Yale University USA: *Economic Growth centre*, p.3. <http://www.econ.yale.edu/growth_pdf/cdp923.pdf>, (accessed on 29 December 2012).
86. Himanshu Thakkar, "Contribution of Large Dams in Food Production, Food Security in India," SANDRP Paper, March 2000, Delhi: South Asia Network on Dams, Rivers and People, <http://www.sandrp.in/irrigation/lrg_dam_contri.pdf>, (accessed on 27 December 2012).
87. Swati Mollah, "Flood Control Policies In India — How Far We Are?," *Golden Research Thoughts*, Volume 2, Issue, 1 July 2012, p.2. <www.aygrt.net>, (accessed on 20 December 2012).
88. Naresh Mitra, "Excessive rain, melting glaciers causing deluge," *The Times of India*, 11 July 2012.
89. *Draft National Water Policy, 2012*, Ministry of Water Resources, Government of India. <http://mowr.gov.in/writereaddata/linkimages/DraftNWP2012_English9353289094.pdf>, (accessed on 16 February 2013).
90. *Report on Economic Impact of Interlinking of Rivers Programme*, National Council of Applied Economic Research, India, April 2008, p. xiii. <http://www.indiaenvironmentportal.org.in/files/99.pdf>, (accessed on 11 July 2011)
91. Neeraj Vagholikar, op.cit., (ref.79), p.363.
92. Ibid., p.365.

93. Jiten Yumnam, *An Assessment of Dams in India's Northeast: Seeking Carbon Credits from Clean Development Mechanism of the United Nations Framework Convention on Climate Change*, Manipur: Citizen's Concerns for Dams and Development, February 2012.
94. Jason Newton, "Displacement and Development: The paradoxes of India's Tehri Dam," *The Geographical Bulletin*, No. 49, Gamma Theta Upsilon, 2008, pp.19-32.
95. MJ Peterson, "Narmada Dams Controversy – Case Summary," *International Dimensions of Ethics Education in Science and Engineering*, Case Study Series, Version 1; September 2010. <http://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1015&context=edethicsinscience>, (accessed on 16 February 2013).
96. Clause IV (6) of the Narmada Water Disputes Tribunal Award states that "in no event shall any areas in Madhya Pradesh and Maharashtra be submerged under the Sardar Sarovar Project unless all payments of compensation and costs are made for acquisition of land and arrangements are made for rehabilitation." This clause has served as the centerpiece for litigation by the Narmada Bachao Andolan (NBA); *The Narmada Valley Project*, Center of Excellence in Environmental Economics, Madras School of Economics, Ministry of Environment and Forests, India. <http://coe.mse.ac.in/nm.htm>, (accessed on 20 February 2013).
97. Hemadri and Mander, op.cit., (ref.77).
98. Neeraj Vagholikar, op.cit., (ref.79).
99. Hemadri and Mander, op.cit., (ref.77).
100. Suresh Chandra, India: Flood Management — Damodar River Basin, *Global Water Partnership* — Associated Programme on Flood Management, December 2003. <http://www.apfm.info/pdf/case_studies/india.pdf>, (accessed on 19 February 2013).
101. Kumkum Bhattacharyya, *The Lower Damodar River, India*, New York: Springer, 2011, pp.120-121.
102. *Mountains of Concrete: Dam-Building in the Himalayas*, International Rivers, USA, 2008, pp.24-27.
103. Neeraj Vagholikar and Patha J. Das, "Damming Northeast India," India Environment Portal, 2010, pp.6-9. <http://www.indiaenvironmentportal.org.in/files/Damming%20Northeast%20India_%20Kalpavriksh_%20Aaranyak_ActionAid%20India_2010.pdf>, (accessed on 18 February 2013).
104. Barry Sadler, Iara Verocai and Frank Vanclay, *Environmental and Social Impact Assessment for Large Dams*, World Commission on Dams, South Africa, November 2000, p.24. <http://www.agsci.utas.edu.au/WCDreportEIA%26dams.pdf>, (accessed on 19 February 2013).
105. Ann Kathrin Schneider, *SJVN: well equipped to develop the Rampur project*? International Rivers Network, USA, July 2005. <http://www.internationalrivers.org/files/attached-files/nathpa_jhakri_rampur.pdf>, (accessed on 20 February 2013).
106. *The Silent Valley River Project*, Centre of Excellence in Environmental Economics, Madras School of Economics, Ministry of Environment and Forests, India. <http://coe.mse.ac.in/si.htm>, (accessed on 20 February 2013).
107. *Teesta River*, International Rivers, USA. <http://www.internationalrivers.org/campaigns/teesta-river>, (accessed on 24 February 2013).
108. "Indira Sagar Polavaram Project Back in the limelight," Projects Monitor, India, 19 July 2011. <http://www.projectsmonitor.com/IRRIGATION/indira-sagar-polavaram-project-back-in-the-limelight>, (accessed on 21 February 2013).
109. *The Narmada Valley Project*, op.cit., (ref.96).
110. "MP: 32 Sq Km Forest Cover Lost Due to Narmada Dam," *Outlook*, India, 17 December 2010.
111. International River Basin Register, Table of Basins, Institute for Water and Watersheds, Oregon State University, updated August 2012. <http://www.transboundarywaters.orst.edu/publications/register/tables/IRB_asia.html>, (accessed on 26 February 2013).

112. Aaron T. Wolf, Jeffrey A. Natharius, Jeffrey, J. Danielson, Brian S. Ward, Jan K. Pender, "International River Basins of the World," *International Journal of Water Resources Development*, Vol.15 No.4, December 1999. <http://www.transboundarywaters.orst.edu/publications/register/register_paper.html>, (accessed on 26 February 2013).
113. *"Avoiding Water Wars: Water Scarcity and Central Asia's Growing Importance for Stability in Afghanistan and Pakistan*," A Majority Staff Report, Committee on Foreign Relations, United States Senate, Washington, 112th Congress First Session, 22 February 2011.
114. *"Hydro Development Plan for 12th Five-Year Plan (2012-2017)*," Central Electricity Authority- Hydro planning and Investigation Division, Government of India, New Delhi, September 2008, <http://www.cea.nic.in/reports/hydro/hydro_develop_12th_plan.pdf>, (accessed on 2 July 2011).
115. United Nations Environment Programme, *Global International Waters Assessment - Challenges to Regional Waters: Regional Assessments in a Global Perspective*, UNEP, Kenya, 2006, p.25.
116. "Tipaimukh High Dam," *International Rivers*, USA. <http://www.internationalrivers.org/resources/tipaimukh-high-dam-3499>, (accessed on 27 February 2013).
117. Khurshid expects resolution of Teesta issue in 7 months, *The Financial Express*, Dhaka, 18 February 2013.
118. Dr. Shastra D. Pant, "Nepal: India's Alarming Harassments through embankment construction," *Telegraph Nepal*, 15 August 2012. <http://www.telegraphnepal.com/national/2012-08-15/nepal:-indias-alarming-harassments-through-embankment-construction>, (accessed on 26 February 2013).
119. Hari Man Shrestha, "River-Linking Concept of India Viewed from the Nepalese Perspective," in Dwarika Nath Dhungel, Santa B. Pun (ed.), *The Nepal-India Water Resources Relationship: Challenges,* New York: Springer, 2009, pp.227-231.
120. Md. Khalequzzaman, *The Indian River-linking Project: A Geologic, Ecological, and Socio-economic Perspective*, Blogs — Water Resources Engineering Forum (WRE), 28 July 2012. <http://wreforum.org/khaleq/blog/4971>, (accessed on 24 February 2013) Also see Md. Khalequzzaman, *Upstream Control of Waters in the G-B-M Basin and potential Impacts on Bangladesh*, Lock Haven University, USA, 2006. <http://www.lhup.edu/mkhalequ/research/IndianRiverLinking_IFC_2006.pdf>, (accessed on 24 February 2013).
121. Md. Khalequzzaman, *Large Dams in NE India and Implications for Bangladesh*, Lock Haven University, USA. <http://www.lhup.edu/mkhalequ/research/Dams%20in% 20NE%20India-Implications%20for%20Bangladesh.pdf>, (accessed on 24 February 2013).
122. According to the report , "India needs to raise global awareness on why the waters in the Tibet region matter to the almost 2 billion lower riparian people living in the Subcontinent and the Southeast Asia region in terms of livelihood and survivability, thereby underlining water resources as a 'commons' and not just for the consumptive use of China." *Water Security for India: The External Dynamics,* IDSA Task Force Report, Institute for Defence Studies and Analyses, New Delhi, 2010, p.50.
123. Mihir Shah, "Bill for land gives true value," *The Hindu*, 13 September 2012.
124. *Social Impact Assessment - National Resettlement and Rehabilitation Policy, 2007*, Section 4.1, Department of Land Resources, Ministry of Rural Development, Government of India, New Delhi, <http://dolr.nic.in/dolr/actandrule.asp>, (accessed on 4 March 2013)
125. Mihir Shah, Bill for land gives true value, *The Hindu*, 13 September 2012.
126. "SC to take final decision on Narmada rehabilitation," *The Times of India*, 11 March 2008.

127. Ramaswami R. Iyer, *Water Perspectives, Issues, Concerns*, New Delhi: Sage publications, 2003, pp.66-68.
128. Ibid., pp.71-72.
129. Samir Mehta, "India's Dam Boom: Small Not Always Beautiful," *International Rivers,* Berkeley, 18 July 2011. <http://www.internationalrivers.org/blogs/257/india-s-dam-boom-small-not-always-beautiful>, (accessed on 9 March 2013).
130. *China 2030- Building a Modern, Harmonious and Creative High-Income Society*, Conference Edition, The World Bank Development Research Center of the State Council, the People's Republic of China, Washington: The World Bank, 2012, p.4, <http://www.worldbank.org/content/dam/Worldbank/document/China-2030-complete.pdf>, (accessed on 4 July 2012).
131. Jan Willem van Gelder, Frank van der Valk, Jan Maarten Dros, Janette Worm, *The Impacts and Financing of Large Dams*, WWF International - Living Waters Programme, November 2002. <http://awsassets.panda.org/downloads/aidenvdamfinancereport.pdf>, (accessed on 11 March 2013).
132. Ibid.
133. "Ecological Protection and Construction, White Paper on Environmental Protection in China (1996-2005)," *China News and Report*, June 2006. <http://www.china.org.cn/english/2006/Jun/170355.htm>, (accessed on 12 March 2013).
134. Ibid.
135. China to spend US$30 bln more on afforestation by 2021, *China News and Report*, 18 August 2010 <http://www.china.org.cn/environment/2010-08/18/content_20739051.htm>.
136. Gov't invests big in water pollution control, *China News and Report*, 29 February 2012. <http://www.china.org.cn/environment/2012-02/29/content_24758528.htm>.
137. "China invests heavily in water conservation," *China News and Report*, 31 January 2012. <http://www.china.org.cn/environment/2012-01/31/content_24515269.htm>, (accessed on 12 March 2013).
138. China's subsidies to reservoir migrants hits $15.84b, Xinhua News Agency, 7 November 2012. <http://china-wire.org/?p=24742>, (accessed on 14 March 2013).
139. "Govt plans for output losses due to climate change," *China Daily*, 28 December 2010.
140. Xiaoyi Jiang, *Legal Issues for Implementing the Clean Development Mechanism in China*, New York: Springer, 31 May 2012, p.207.
141. "China, India and climate change: Melting Asia," *The Economist*, London, June 2008.
142. From the 1980s, China started practicing the policy of allocating a percentage of revenue from the sale of electricity not just for financing resettlement costs but also to address previous resettlement issues. Thayer Scudder, *The Future of Large Dams: Dealing with Social, Environmental, Institutional and Political Costs*, London: Earthscan, 2005.
143. M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson (eds.), "The Himalayan Glaciers," *IPCC Fourth Assessment Report: Climate Change 2007*: Working Group II: Impacts, Adaptation and Vulnerability, Cambridge University Press, Cambridge, United Kingdom and New York, USA.
144. Dirk Scherler, Bodo Bookhagen and Manfred R. Strecker, "Spatially variable response of Himalayan glaciers to climate change affected by debris cover," *Nature Geoscience*, 23 January 2011. <http://www.nature.com/ngeo/journal/v4/n3/full/ngeo1068.html>, (accessed on 16 March 2013). Also see Kenneth Hewitt, "Glacier Change, Concentration, and Elevation Effects in the Karakoram Himalaya, upper Indus Basin," *Mountain Research and Development*, June 2011.
145. M. Sharif, D.R. Archer, H.J. Fowler, and N.Forsythe, "Trends in timing and magnitude of flow in the Upper Indus Basin," *Hydrology and Earth System Sciences Discussions*, 9, 9931–9966, 2012.

146. *Annual Plan, 2011-2012*, Planning Commission, Government of Pakistan, Islamabad, p.147.
147. "Tarbela desilting to be costlier than new dam," *Dawn*, 7 January 2013.
148. Power Issues: Government willing to hook up with India, *The Express Tribune*, Islamabad, 2 November 2011.
149. Kenneth Hewitt, "Gifts and Perils of Landslides," *American Scientist*, Volume 98, 2010, pp.410-419.
150. Resettlement in the Pakistan Ghazi-Barotha Hydropower Project, The World Bank, Washington, D.C. (publication date unavailable). <http://siteresources.worldbank.org/INTINVRES/214574-1115363218432/20480138/ResettlementPakistanGhaziBarothaHydropowerProjectCaseStudy.pdf>, (accessed on 16 March 2013).
151. Dr. Shahid Ahmad, *Pakistan Water Apportionment Accord for Resolving Inter-Provincial Water Conflicts — Policy Issues and Options*, International Union for Conservation of Nature and Natural Resources, IUCN Pakistan, Karachi, 2010, p.8. <http://cmsdata.iucn.org/downloads/pk_ulr_d4.pdf>, (accessed on 18 March 2013)
152. Neeraj Vagholikar, op.cit., (ref.79), pp.367-368.
153. Matt McGrath, "Reservoirs can make local flooding worse, says study," BBC News, 14 December 2012. <http://www.bbc.co.uk/news/science-environment-20663875>, (accessed on 22 December 2012).
154. Amrita Patwardhan, "Dams and tribal people in India," Paper prepared for *Thematic Review 1.2*, World Commission on Dams, South Africa, 2000, p.10.
155. M.K. Goel, Sharad K. Jain, and P.K. Agarwal, "Assessment of Sediment deposition rate in Bargi Reservoir using digital image processing," *Hydrological Sciences Journal*, 47(S) August 2002, p.82.
156. Jack D. Ives and Bruno Messerli, *The Himalayan Dilemma — Reconciling Development and Conservation,* The United Nations University, New York: Routledge, 1989.
157. Kirk Leech, "The Narmada dambusters are wrong," *The Guardian*, London, 3 March 2009. <http://www.guardian.co.uk/commentisfree/2009/mar/03/india-narmada-dams>, (accessed on 21 February 2013).

INDIA – MYANMAR RELATIONS: IS THERE A SHADOW OF CHINA?

HUMERA IQBAL

Introduction

The end of the Cold War-ushered in a new era for the world and so did for India. India was left to think afresh as the reasoning and policies of the past could not apply in the new epoch. The Nehruvian foreign policies, in particular of non-alignment and staying away from bloc politics, were no longer applicable in the post-Cold War situation presented for India. With the start of the 1990's, the Soviet Union, diplomatic ally and trading partner of India, withered away with no communist political, military and economic counterpoise to China in the region; Chinese presence in India's east in Myanmar (known as Burma until June 1989) and Asia Pacific region grew substantially; while, India's political and economic crisis of mid-1991 took on worrisome proportions. These emerging developments around and within India compelled it to re-examine its domestic and geo-political policies for securing and enhancing its independence within and beyond the region. A thoughtful assessment brought to attention the eastward potential and gave birth to India's 'Look East Strategy.'

Theoretical framework

To understand the relations between India and Myanmar vis-a-vis China a theoretical framework has been applied to get a better understanding of the subject under study. The "Balance of Threat" theory will give an insight into the India-Myanmar relationship and the basis of alliance formation that India decided to act upon with not only its neighbour Myanmar but also with the Southeast Asian states against China's expanding interests in the neighbouring Myanmar and the region as a whole.

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The "balance of threat" theory was proposed by Stephen M. Walt in an article titled "Alliance Formation and the Balance of World Power," published in the *International Security* journal in 1985. The theory basically modified the traditional balance of power theory of the realist school and also of Kenneth Waltz's neorealist school of international relations by separating power from threat. The idea behind embracing this new concept was that Stephen Walt explored in detail the question, "what causes alignment?" Most of the scholarly work undertaken by researchers had ignored or was incomprehensible on this question of how states select their partners.

Explaining the concept Walt identifies important factors states take into consideration to evaluate the threat and its effects posed by states. The important hypotheses pointed out by Walt for alliance formations are:

Balancing vs bandwagoning:
Alliance as a response to threat

Stephen Walt beheld in the balance of threat theory that states' alliance is determined by the *threat* they perceive from other states not the *power*. Although Walt holds that power is an important factor, yet to him it is not the only one. Instead of allying in response to power alone, states will ally with or against the most threatening power. Walt contends that when allying for balance against threat, the weak states are more likely to bandwagon in order to protect themselves. He argues that the more states view a rising state possessing these mentioned traits the more likely they are to consider it as a threat and take steps for balancing against its threat.[1] Different sources of threats are:

a. **Aggregate power**: The greater a state's total resources, i.e. population, industrial and military capability, technological prowess, etc., the greater a potential threat it can pose to others. So by itself, another state's aggregate power may be a motive for balancing or bandwagoning.[2]

b. **Proximate power**: States with geographical proximity pose a greater threat than those that are at distance. When a proximate power threat leads to bandwagoning, a familiar phenomenon of "sphere of influence" gets created. Small states neighbouring or bordering a great power may become so vulnerable that they choose to bandwagon instead of seeking balance.[3]

c. **Offensive power:** States with large offensive capabilities are more likely to incite an alliance than those who are either militarily weak or only capable of defending. The immediate threats such capabilities pose compel states to balance by allying with others.[4]

d. **Offensive intentions:** States that appear aggressive are likely to provoke others to balance against them while states with rather modest capabilities may also trigger a balancing response if they are perceived as aggressive. Here perceptions of intent play an important role in alliance choices. In short,

intentions, not power, are crucial. The more aggressive or expansionist a state appears, the more likely is it to trigger an opposing coalition.[5]

Ideology and alliance formation

Walt in his theory argues that ideological solidarity is important in alliance formation; yet it is just one factor among many. States expectedly follow their ideological preferences when they are already fairly secure. When they are faced with great danger, states take whatever allies they can get.[6] When ideology calls for members to form a centralized movement, ideology will have a divisive role. Secondly, apparent significance of ideology can be exaggerated by the perceptions of statesmen and policies they adopt as a result. Hence, ideology does play a role in alliance choices but it is usually a subordinate one because reality may actually be quite the opposite. Security considerations actually take precedence while ideological alliances do not survive when pragmatic interests intrude.[7]

The instruments of alliance formation

States seeking alliance will employ specific policy instruments to attract others to their side. The use of such instruments rests upon implicit hypothesis about the relative effectiveness of such tactics. The most substantial instruments are "bribery" (foreign aid) and penetration.[8]

a) International bribery or foreign aid

The provision of economic or military assistance creates operative allies by communicating one's favourable intentions, by evoking gratitude, so that the recipient becomes dependent on the donor. The premise is that more aid will result in stronger alliance. Foreign aid gives suppliers effective leverage over the recipients.[9] Walt disagrees with the notion that foreign aid is the main cause of alignment or a powerful influence tool because it ignores the fact that military or economic assistance is offered and accepted only if both the parties agree that it is the only way for responding to a common threat. The conditions under which assistance is taken also need to be taken into account. Bribery gives supplier political leverage over recipient only when the supplier is the only available source of economic or military aid else leverage will be limited as recipient can obtain it elsewhere. Since recipients are weaker than suppliers, tough bargaining takes place. However, suppliers will be hesitant to cut off supplies so as not to make their allies insecure. If the recipient is vital to the donor then more aid is given and recipient is not put under pressure. That means client successfully manipulates the patron into providing increasing amount of support. The provision of aid can be self-defeating as it strengthens the client's position and lessens the patron's desires.[10]

b) Penetration

The final hypothesis concerns the effects of political penetration carried out by covert or indirect manipulation of one state's political system by another. This is done through (i) public officials with divided loyalties, (ii) lobbying organizations may be used to alter policy decisions and public perceptions and

(iii) foreign propaganda, used to sway elite and mass behaviours. Penetration is more effective against open societies, when the objectives are limited, and the means are not intrusive.[11]

The theory under discussion rightly applies to India in its relations with Myanmar and China. India felt threatened by the economic and military goals in its neighbouring Myanmar. Furthermore, India felt highly insecure because of what it perceived as China's expansionist maritime interests in India's domain through Myanmar. The theory in this situation elaborates the steps taken by the Indian government in revising its policies towards the neglected neighbour, Myanmar, and then forming alliance with the smaller Southeast Asian countries through ASEAN who shared similar threat perceptions over China's dominant status in the region. India used economic and military tools like that of China to bring Myanmar out of Chinese influence which Myanmar accepted willingly. The arguments and a detailed discussion in the paper further support and relate to the hypothesis and reasoning of balance put forward in the threat theory.

Main argument

The main argument of the paper is that India after the loss of the traditional international partner, the Soviet Union, at the end of the Cold War felt vulnerable and insecure over the growing influential presence of China across the border in Myanmar. India-Myanmar relations were at a standstill after the military coup in the latter and had turned antagonistic with China after the 1962 war. India brought a shift in its policies towards Myanmar and the eastern region as a whole to counter rising Chinese status both economically, militarily and in maritime matters in Myanmar. India felt threatened and found similar feelings among the eastern countries which favoured forming an alliance with it with ASEAN countries' support for balancing and countering the Chinese dominance. Though in pursuing its policy initiatives and moves for securing its interests, India still faces challenges and constraints, notably the tough competition from China in Myanmar.

A geo-strategic 'Golden Land'

Before shedding light on India-Myanmar relations and China's influence in the latter, it is pertinent to know why Myanmar so important to both Asian giants' foreign policy interests. Myanmar, historically known as a 'Golden Land', though unfortunately a hermitland, is uniquely placed in a geo-strategic location on the map of the world. Myanmar lies between two nuclear armed Asian giants, India and China, and at the crossroads of South Asia, Southeast Asia, and East Asia as a strategic bridge connecting the three vital regions.

From the perspective of Samuel Huntington, Burma straddles the fault lines of the Hindu, Buddhist and Confucian civilizations. It separates China from the Indian Ocean, and although does not dominate the major sea lines of communication (SLOCs) yet is closer to significant Indian Ocean shipping lanes that are crossed by active east-west commercial air-routes. This is the fourth

crucial connecting position it has had for centuries where foreign empires and invaders engaged in hegemonic struggles.[12] Myanmar in its south links with the strategic Andaman Sea and Bay of Bengal. It shares common borders with five resource-rich countries: Bangladesh 193km; China 2,185 km; India 1,463 km; Laos 235 km; and Thailand 1,800 km.[13]

Myanmar in the 1950s was considered an Asian domino by Western democracies that valued it as much as Vietnam and Thailand. Although after 1962 its strategic importance declined when it isolated itself from the international arena, yet in the 90s Myanmar once again emerged as a significant regional player, in particular vis-a-vis the neighbouring India and China as a result of the shift in the regional power balance. Given Myanmar's geo-strategic significance for both its neighbours, complex and competitive nature of the two rising Asian powers' interests in the energy, border security, maritime and economic sectors has been inevitable.

A historical overview of India-Myanmar relations

The Indian diaspora broadly spread across the neighbouring region worked out well for India by identifying and connecting itself with the host country. The British legacy of transporting a large number of Indian labourers to different parts of their empire including Myanmar (at that time known as Burma) in Southeast Asia helped India pursue its interests through reconnecting the lost ties with the host country. India not only has cultural and ethnic ties with Myanmar but also religious links with the country and the rest of the Asia Pacific region. Buddhism, originating in India, spread towards the eastern region creating a sentimental connection between India and Myanmar and several other Asian countries.[14]

The personal friendship between democratic prime ministers Nehru and U Nu formed the basis for cordial ties between the two countries from 1948 to 1962. After General Ne Win's military coup toppled the democratic government in Burma in 1962, hostility between the two states began to simmer, mainly because of military regime's nationalizing of economic and trade sector. Consequently, more than 200,000 people of Indian origin were forcibly sent back home. These people, who were Burmese-Indians and not Indian-Indians, were sadly subjected to harsh treatment in Burma.

Another turning point in bilateral relations came with the Indian support for the struggle for restoration of democracy in Myanmar led by Aung San Suu Kyi, and India's official criticism of the bloody crackdown on democratic voices against the military coup in 1988. The Indian government fully supported the democratic forces and implemented a clearly defined refugee policy that not only welcomed Myanmar's political refugees and provided them shelter but also gave them liberty to criticize Myanmar's military rulers — the State Law and Order Restoration Council (SLORC) — through All-India Radio (AIR). India's welcoming the Nobel Peace Prize award to Aung San Suu Kyi in October 1991 led Myanmar to condemn it for instigating insurgency.[15]

Bilateral relations saw further tensions after 1988 when Myanmar armed forces stepped up military campaigns in the region bordering India's Northeast. Military action along the border with Nagaland drove thousands of refugees into India, which protested and called for steps for the return of Burmese nationals.[16] Both got engaged in fuelling and financing cross-border insurgencies in each other's troubled regions: the Burmese army supported Indian insurgent groups in Nagaland and Manipur whereas India gave its clandestine support to Burmese democratic politicians and well-trained ethnic rebel groups like the Kachin insurgents.[17]

Lengthening Shadow of China over Myanmar & Indian fears

As stated above, in the post-Cold War environment a politically and economically vulnerable India felt deep concerns over what it perceived as the growing Chinese hegemonic ambitions in South, Southeast, Central and Inner Asia, China's growing presence in Myanmar and the emerging economic tigers in the east. The overpowering and evergrowing relationship of China with the military government in Myanmar, India's nextdoor eastern neighbour, for the first time compelled the Indian government to come out of their foreign policy constraints.

It was in Myanmar more than anywhere else that India felt threatened because of what it perceived as China's military domination. Already China's support for Pakistan in India's west had put it under pressures and China's closer military presence on the eastern front in Myanmar added to India's strategic concerns.[18] India felt as if being encircled by China on four fronts, China's land frontiers; its land links with India's neighbours; its maritime presence in the Indian Ocean; and its maritime links with India's neighbours, in other words, power projection from China itself and through its 'strategic proxies'.[19]

A closer look at the relations between Beijing and Rangoon (old capital of Myanmar, later renamed Yangon) reveals the sense of strategic insecurities haunting Indian policy makers at the time. China-Myanmar relations go a long way back as a democratic Myanmar was one of the foremost countries that recognized the People's Republic of China in 1949 thus seeking friendly bilateral relations. Both countries not only signed their first trade agreement in 1954 but also signed a boundary treaty in 1960.

After patchy phases of the 1960s and 70s, both countries settled on founding a strong relationship. During his visit to Beijing in 1977 Gen Ne Win signed a $63 million aid agreement for various projects[20] in Myanmar. Further visits came in 1980. Chinese President Li Xiannian visited Myanmar in 1985.[21] The military crackdown on pro-democracy demonstrators in Tatmadaw, Myanmar, in 1988 and in Beijing's Tiananmen Square in 1989 followed by clamping of sanctions by international community on both countries, compelled China to look at its Asian neighbours as an alternative. Myanmar on the other hand, strategically located and rich with energy resources, became economic and military interest of China,[22] as it abandoned decades of isolationism by

strengthening bilateral ties with China,[23] while India's relations with the country gradually entered a period of suspension.

The cooperation began with concrete gains for both sides in many explorative areas. Myanmar sits on vast energy resources; it has gas reserves which due to sanctions were only exportable to its neighbours, and China has been one huge market as its economic growth depends to a large extent on energy imports. China by 2011 had been third largest trading partner of Myanmar and largest foreign investor. China has access to an oil pipeline that runs to Kunming, capital of its Yunnan province.[24]

As border trade flourished on both sides Myanmar signed an agreement to obtain arms estimated at about $1.4 billion, while China in exchange gained a contract to build port facilities, an opening to the Indian Ocean. As for cooperation in defence, Myanmar received modern weaponry systems, arms and equipments ranging from light to medium tanks, APCs, F-7 fighters, patrol vessels, anti-aircraft artillery, grenade launchers to multiple-launch rocket systems and communication equipments,[25] mostly accompanied with technical training programmes. China also helped Myanmar in upgrading defence industries by building small factories and facilities for naval improvements.[26]

India got alarmed when China installed in Myanmar a maritime reconnaissance and electronic intelligence station on Great Coco Island in the Bay of Bengal, along with a base on Small Coco Island that the Chinese army was building in the Alexandra Channel between the Indian Ocean and the Andaman Sea north of India's Andaman Islands. These two islands, leased to China since 1994, are located at a crucial point on traffic routes between the Bay of Bengal and the Strait of Malacca. The facility can monitor regional military activities, mainly air and naval activities, in the eastern parts of Bay of Bengal, and India's strategically important tri-service military facilities, its naval and missile launch facilities on the Andaman and Nicobar Islands. The Great Coco Island station, with antenna tower, radar sites and other electronic facilities that form a comprehensive SIGINT collection facility, was in operation by 70 Chinese naval personnel by mid-1993 and by 1994 it was ready to be used.[27]

Another apprehension for the Indian policymakers that challenges India's primacy in the region is the strategic maritime expansion of China in the Indian Ocean by partaking in the civil and military infrastructure developing programmes in Myanmar. Chinese companies associated with the People's Liberation Army (PLA) have been involved in constructing port facilities at Sittwe and Kyaukpyu on the Bay of Bengal, Bassein and Hainggyi Island in the Irrawaddy Delta, Mergui in southern Myanmar, and at Yangon. Some commentators suggest that these ports may not only handle increasing flow of trade goods from southern China, but could also be used as forward operating bases for the PLA Navy (PLAN). The Chinese intelligence facility on Zadetkyi Kyun reportedly includes an earth satellite station that Indian officials believe is capable of keeping contact with Chinese submarines operating in the Bay of Bengal and Andaman Sea.[28] Hence it is debated in India that China's "string of pearls" strategy aims to encircle India militarily in the Indian Ocean in case of a conflict between the two.[29]

The airfield construction projects, with Chinese assistance in north and north-western Myanmar, have alarmed Indian security establishment as there are nine airfields and one of these, Bhamo, close to China's southern border, is said to be 'clustered in a zone running north to south adjacent to Myanmar's border with India'.[30] Until recently almost 80 per cent of Myanmar's defence equipment was coming from China.[31] Myanmar used the China card by extracting maximum gains and China used Myanmar's isolationism to maximize its diplomatic, economic, military and maritime interests in Myanmar and beyond.

'Look East' Policy: A strategic shift in New Delhi's vision

The Chinese shadow over Myanmar and a potential strategic threat to India's future security and national interests led India to reverse its policies and look towards the East. India had relatively kept away from Myanmar once the relations got soured, the reason being India's ruling elites getting too much concentrated on the Western bloc and ignoring the underdeveloped neighbour. Both India and South East Asia were on opposing sides of the Cold War divide. Besides, India's economic policies were protectionist and insular when it came to choosing trading partners while Myanmar had closed itself to the rest of world. Therefore, Indian foreign policy lacked crucial insight into the closest opportunities that Asian neighbour could have provided despite so much shared historical baggage.[32] By the time India realized the strategic importance of the resource-rich Myanmar and its role as a gateway to broader economic prospects, and no longer ignored rising Chinese influence there and its assertiveness in the Asia-Pacific region that had impacts on Indian security, New Delhi had lost its strong foothold in Myanmar.

The new world without the bipolar East-West divisions presented India with a realistic perspective that discouraged treating South Asia and Southeast Asia as separate strategic theatres. Hence keeping in mind the domestic and regional changes Indian prime minister V.P. Narasimha Rao broadened New Delhi's strategic vision according to shifting world paradigm.[33] The Narasimha Rao government introduced a fundamental change in the foreign policy to what is popularly known as "Look East Policy" in 1991. I. K. Gujral explains this policy as: "What 'look east' really means is that an outward looking India is gathering all forces of dynamism, domestic and regional, and is directly focusing on establishing synergies with a fast consolidating and progressive neighbourhood to its East in Mother Continent of Asia."[34]

Basically the essence of the policy was that India should find more and more linkages with the eastern neighbours as part of realpolitik where it will not only get its economic integration interests served but also raise India's status in the evolving global economic world. Accordingly, in this context India pursued a two-pronged strategy. First, it brought a notable shift in its Myanmar policy to counterbalance Chinese weight there by following a constructive engagement policy. India abandoned its earlier stance of isolating Myanmar's military regime buy distancing itself from human rights and democracy stance to take

Myanmar out of Chinese influence. Secondly, India began to look for common interests with Southeast Asian countries that shared Indian threat perception about China.

Indo-Myanmar re-connects

After a bumpy diplomatic restart between the two neighbours in the early 1990s, a real swing came in 1998 when Indian foreign secretary K. Ragunath visited Myanmar to materialize Narasimha Roa government's objectives. He discussed issues concerning strategic cooperation on internal security, border management and border trade prospects, curbing of drug trafficking and smuggling. These issues were of utmost importance to India as the poorly shaped and underdeveloped Northeastern states of India were obstructing the strategic interests connected with Myanmar and beyond in countering Chinese initiatives. Myanmar's foreign minister Win Aung in return visited India after more than 15 years.[35]

Hence, frequent exchange of high-level official visits began to take place that contributed to reconnection of linkages. The Indian government formed cordial cooperative ties with the military ruler in Myanmar. In November 2003, Indian vice-president Bahiron Singh, the highest ranking Indian official since Rajiv Gandhi's 1987 visit, commenced a five-day visit to Myanmar. Myanmar's senior General Than Shwe, chairman of the state peace and development, paid a state visit to India in 2004. It was the first head of state level visit from Myanmar in 24 years and high-level interaction in 17 years. As a sequel, Indian president Abdul Kalam paid a visit to Myanmar in 2006 that made him the first-ever Indian president to visit the country. These high-ranking bilateral visits indicate the importance India gives to amiable relations with Myanmar.[36]

At the time of the 2010 elections in Myanmar much of the international community criticized the military junta except India which remained silent. India has been very cautious in maintaining cordial ties with its neighbour so that it can lure it away from Chinese influence. India even warmly received senior General Than Shwe during his visit and the two governments signed security and economic pacts.[37] India encouraged the democratic transitional phase in Myanmar. After her release democratic icon Aung San Suu Kyi chose India as the first country to visit. Aung San Suu Kyi openly sought India's help for the democratization process of Myanmar and expectedly wants Myanmar to balance between India and China.[38] Diplomatic skills gained India an assurance from Myanmar that it would not allow anti-India bases on its soil.[39]

New Delhi competently targeted resource-rich and developmental areas like socio-economic, energy and security related to both land and sea routes to make deeper inroads into Myanmar.

Trade & Development

India's four northeastern states — Mizoram, Manipur, Nagaland and Arunachal Pradesh border — Myanmar. This border linkage was translated into trade relations and sea route. Therefore, to attain first policy objective, Indo-

Myanmar Border Trade Agreement was signed in 1994 on the basis of equal and mutual benefits. The agreement was implemented by opening different cross-border customs posts for trade purposes in 1995, especially at Moreh in India (Manipur State) and Tamu in Myanmar; Zowkhathar in India (Mizoram State) and Rih in Myanmar. Later, both countries decided to convert this border trade into regular trade paving the way for trade at most favoured nation (MFN) rates for goods. A third border trade point was opened at Avakhung in India (Nagaland) and Leshi in Myanmar after it was decided during a Joint Trade Committee session in 2008. The committee also expanded the list of tradable to 40 items from an initial 22 products.[40]

The bilateral trade increased more than 80 times, from US$12.4 million in 1980-81, to a level of $995 million in 2007-08.[41] The fiscal year 2006-07 trade was 650 million US dollars while $ 341.40 million in 2004-05. It had jumped to $ 557.68 million in 2005.[42] The figure is expected to double to $3 billion by 2015, from the current level of $ 1.3 billion, on the back of free trade agreement.[43]

Besides, trade many ambitious developmental projects for building roads, dams, hydroelectric schemes, banking links, cooperation in IT, textiles, transportation, etc. were undertaken by the Indian government in Myanmar. The most significant ones include the November 2003 offer of $ 57 million by India to upgrade Myanmar's railway network.[44] The-165 km long Indo-Myanmar Friendship Road was built by India that connects with Tamu and Kalaymyo-Kalewa.[45] Kaladan Multi-Modal Transit Transport project has been assisted by India that envisions road and inland waterways from Sittwe port in Myanmar to Mizoram. Another project is the upgrading of Rhi-Tiddim road (about 60 km) in Myanmar adjoining Mizoram; and some sections of Trilateral Highway project of about 1,360 km that connects Moreh (Manipur, India) to Mae Sot in Thailand through Myanmar.[46]

Energy

Myanmar's vast energy reserves of oil and natural gas make it an attractive partner for both India and China due to their rising economic security needs. The oil and gas industry in Myanmar is said to be among the oldest ones though largely dominated by Asian companies, notably China.[47] As of a 2011 evaluation, Myanmar holds 2.1 billion barrels of oils and 25 trillion cubic feet of gas.[48] Hence, Indian interests and need urged India's ONGC Videsh Ltd. and Gas Authority of India Limited together to hold 30 per cent rewards in the exploration and production of gas in Myanmar's A1 and A3 offshore blocks located in the Sittwe area of the Arakan state. In fact India has been preparing a 1,400-km pipeline to link the Sittwe area with Jagdishpur-Haldia pipeline in Bihar.[49]

Armaments

India joined the ranks of China by gradually supplying arms to Myanmar. Initially it supplied low-tech arms and armaments like transport planes, T-55 tanks, artillery ammunition and naval craft. However, with a visit

of all the three chiefs of Indian forces to Myanmar for building a better bond, India upgraded its export to supplying counterinsurgency helicopters, avionics upgrades and naval surveillance aircraft.[50]

Challenges and Constraints

Since India's strategic goals of countering Chinese influence and making inroads through Myanmar into Southeast Asian region depends on establishing a secure and developed northeast region bordering with Myanmar, New Delhi has been trying to remove the irritants in border areas to move ahead in the region smoothly. Already bilateral collaboration suffered in the past because of delays and uncertainty that cost India productive cooperation in the hydrocarbon sector, where China benefited.[51] Chief among these challenging irritants are:

Cross-border insurgency

India's North-East has become a constant base for various kinds of separatist movements and one main reason for the growth of such groups as mentioned earlier has been the cross-border support enjoyed by them. The issue is linked to historical and economic deprivation where Myanmar's insurgency like that of the Kachins grew largely out of World War II experience; with skilled warfare training and organizational capabilities they influenced armed groups of North-East India by training them in exchange for hefty sums. For armed groups to operate outside Myanmar due to cheap availability of arms and other goods supplied at high prices in India serves to improve their economic conditions. Therefore, it was a necessity for India, security being the chief concern, to tackle insurgent strongholds in its Northeastern border area with Myanmar. Both sides had agreed since 1995 to jointly fight insurgencies and undertake joint border fencing.[52]

The continuous Indian pressures on curbing insurgency resulted in some positive outcome like joint military operations conducted by India and Myanmar, notably 'Operation Golden bird' (May 1995) and 'Operation Leech' (1996).[53] In January 2006 as well joint military operations against rebels inside Myanmar were conducted.[54] Moreover, an 18-member Myanmar delegation agreed to crack down on Indian insurgents bases followed by a pledge not to permit its territory to be used by Northeastern insurgents to target India. However, in December 2000, 198 Northeastern Indian insurgents were arrested from camps in Myanmar who were not extradited as New Delhi requested but were set free. Similarly, Meitei rebels of Manipur captured inside Myanmar were also released instead of being handed over to Indian authorities.[55] Such incidents show that past mistrust still prevails between India and Myanmar despite notable efforts in the past decade.

Drug trafficking & smuggling

Drug trafficking and Smuggling is linked to cross-border insurgency as the rebels make use of the porous border for such activities. An example is the dominant Naga insurgent group, the National Socialist Council of Nagaland

(NSCN), getting help from the Karen National Union (KNU) insurgent group in Myanmar for cross-border smuggling of small arms from Southeast Asia and Yunnan province in China via Myanmar to the North-East.[56] In 2006 a meeting was held between both sides home ministers where it was decided to set up a police liaison post at India- Myanmar border. The post meant to provide a daily interaction platform, joint interrogation of those arrested in drug related cases, etc., and information-sharing at field and national levels. The failure to check drug trafficking has led to funding of insurgencies by drug trade. A bilateral agreement was signed in 1993 to stop narcotics trafficking, though the smuggling still continues between India's northeastern states bordering Myanmar.[57]

ASEAN and alliance

The second policy objective was realized by utilizing Myanmar as India's gateway to Southeast Asia or to the Association of South-East Asian Nations Alliance (ASEAN) countries. India had shared good relations with the ASEAN countries for a long time but that declined once India became more cordial with the Soviet Union; it resulted in political and diplomatic differences. The ASEAN countries distrusted the Soviet Union and so India was also seen suspiciously, especially after the Indo-Soviet Friendship Treaty of 1971. However, after the dissolution of the USSR India embarked on reviving its strategic and economic ties with ASEAN countries to counterbalance Chinese presence in the Indo-China region that India perceived as threatening its security and regional aspirations. And for that it had to rely on opening up to Myanmar.[58]

The conscious change in India's economic policy opting for an outward-oriented economy with a realization of the importance of regionalism beyond South Asia was welcomed by the Southeast Asian countries. After the disintegration of the USSR, the Southeast Asian countries felt an imbalance of power in Asia due to the rise in China's power. One important consideration taken into account by the ASEAN in welcoming India into their ranks was their fears about China's rising power and its maritime spread into the South China Sea. These countries decided in guarding against Chinese expansion by setting up vital sealanes of communication as points such as Taiwan, Malacca, Sunda and Lombhok Straits. Consequently, India with largest naval forces in the Indian Ocean together with its nuclear capabilities was deemed fit as a strategic partner to balance China's growing power in the region.[59]

China is expected to achieve a high-class blue-water navy status by 2050 and Myanmar provides China access to the Pacific and Indian oceans. It was reported that China and Myanmar were interested in joint development of a deep-water port at Kyaukpyu on Ramree Islands in the Bay of Bengal and that raised India's concerns. Moreover, Chinese military installations at the Zadetkyi Island in southern Myanmar close to Indonesia's Sabang Island raised suspicions about perceived Chinese maritime ambitions in the Indian Ocean.[60] Jakarta also remains suspicious of what it sees as Beijing's extra-territorial ambitions. During the Cambodia conflict Thailand was uncomfortable with

Beijing's military presence in its western maritime coastal region. Therefore, China's strategic maritime interests had security implications not only for India, Indonesia, Thailand, and Japan but also for ASEAN as a whole.(61)

Prime Minister Narasimha Rao embarked on his mission seeking diplomatic relations with ASEAN countries by paying visits to these countries. During these visits he pointed out the possibility of India becoming a counterbalance to China in Asia. During Rao's visit to Vietnam in 1994, prime minister Vo Van Kiet appreciated India's 'stabilizing role' and suggested Vietnam looked upon India as helping counterbalance or dilute China's power.(62) Other ASEAN members also encouraged India's playing such a role during various diplomatic visits made by high Indian officials to these countries.

The growing complementarities of views led to acceptance of India as ASEAN's sectoral partner in early 1992 and full dialogue partner in July 1996.(63) Even after New Delhi got economically engaged with ASEAN and was actively participating in various projects to get a strong foothold within ASEAN and the region, India supported ASEAN's efforts for drawing Myanmar into its orbit to end its dependence on China. Myanmar is the only ASEAN country having land and sea borders with India. Interestingly, with the passage of time as relations with China grew deeper, a feeling of insecurity also started growing within the military junta over mounting Chinese presence in Myanmar. With Chinese assistance Myanmar had re-established its strategic position in the region. However, when ASEAN, especially Thailand, offered political and economic assistance, Myanmar grasped the opportunity by shifting its political stance of neutrality and economic autarky.(64)

The first tangible step India took after joining the ASEAN was to set up a Mekong-Ganga Cooperation Project in 2000 that included ASEAN countries along with the newer members including Myanmar, Vietnam, Thailand, Cambodia and Laos. India looked at ASEAN as a platform for shaping up a multilateral security order in the Asia-Pacific region. For India to remain connected to Myanmar is crucial for its policies. India and ASEAN signed a Free Trade Agreement in August 2009 which covers 11 countries including Myanmar. Some Indian initiatives, such as ASEAN Regional Forum, India-ASEAN Summits, East Asia Summit, Bay of Bengal Initiative for Multi-Sectoral and Technical Cooperation (BIMSTEC) further provide avenues for mutual cooperation between India and Myanmar. India has been assisting India-Myanmar-Thailand Trilateral Highway project and also upgraded the Yangon-Mandalay Trunk line besides setting up an optical fibre link between Moreh and Mandalay.(65)

India – China competition in the 21st century Myanmar

Myanmar's changing political state of affairs after the democratic opening has made Indian as well as Chinese interests vulnerable in the country. Both India and China have become more competitive seeking economic and strategic edge in the resource-rich Myanmar. There is a shift in Myanmar's dealings with both of them.(66) While China still enjoys a privileged position due

to its diversified investments in the country, Myanmar adopted a "counter-hedging strategy" by following an open-door policy where India entered the scene. However, presently it seems that it is exploiting the fears of both its neighbours to gain maximum benefit by giving them investment opportunities while at the same time their interests remain vulnerable to changing state of mind in Myanmar.[67]

Engaged in a balancing act vis-a-vis India and China in its own way, Myanmar halted its decades old friend China's $3.6 billion hydroelectric project in Kachin state. The suspended Myitsone Dam project, being built by China power Investment, is one of the seven to be constructed on the Irrawaddy River to provide electricity to China's Yunnan province. China, the biggest lender to Myanmar, invested $10 billion during 2010-2011 fiscal year. Later the government sent a delegation to China to discuss the matter. Myanmar seeks support from New Delhi in the democratic reforms introduced by the military government. Hence, the goal of its balancing act of diplomacy is to cooperate with both as it needs both its neighbours support and partnership.[68]

While India had been pouring millions in improving transport links in Myanmar, Chinese firms are equally spending billions on infrastructure building projects on energy pipelines. One significant competitive interest other than maritime of both India and China in Myanmar as mentioned earlier is energy where both countries have conflicting interests. China National Petroleum Corporation (CNPC) in December 2008 signed a deal to buy natural gas from the Shwe fields and has starting constructing two major energy pipelines across Myanmar.[69]

India had been looking for onshore and offshore gas blocks on Sittwe route which China gained access to, due to Bangladesh's presence in between Southeast Asia and India's Northeast region that created difficulties. Myanmar neglected the Arakan region, so India lost its connection with Arakan and China gained onshore blocks there. India has A1 and A3 energy blocks but Chinese interest lies in building a pipeline from A1 to A7 blocks from Myanmar to China. For this China needs to build deep sea water ports in western Arakan, which India was looking for control of these ports. India is forced to sell the 30 per cent energy stake A1 and A3 blocks to China because of absence of a proper pipeline link with Myanmar.[70]

Water will become potential source of tension between India and China. All the major rivers of Asia, except for the Ganges, originate in the Tibetan plateau. Therefore, China's control of the headwaters of the Indus, Mekong, Yangtze, Brahmaputra, and other rivers, which collectively serve nearly half of the world's population, may become highest conflict point and challenge to the region. In particular, when Beijing has built dams on these major rivers for hydropower and irrigation. Already bedevilled by shadows of the 1962 war with China on the Indian psyche, if water geopolitics gets inflamed then interstate tensions, especially those popping up between India and China, might disrupt Asian economic connectivity.[71]

Myanmar has established close bilateral relations with both its neighbours, to the extent of having people-to-people contacts and exchange of

goods through border trade zone. However, India gets tough competition from China. In 2006 China-Myanmar trade reached $721 million while India-Myanmar border trade was a mere $17 million. In spite of the delays in Myitsone project China has not been pushed away from Myanmar. It's simply that Myanmar, gearing up for attracting Western investments, has altered the modus operandi of doing business and that alters the procedure for Chinese investors as well. Myanmar's U Thein Sein welcomes Chinese investment as it is very well known in Myanmar that China's role in the country remains dominant and is beneficial for it. Aung San Suu Kyi also encouraged continuing cordial relations with Beijing. This is what actually means by Myanmar's re-balancing of its foreign relations where foreign players along with China would be competing with each other in dealing with Myanmar.(72)

A serious setback for India here is that while China has been able to either resolve or shelve its border disputes with Myanmar, India is still struggling with ongoing conflicts with its bordering countries besides the insurgency in its Northeast region that hampers border peace and trade. For instance, India has not so cordial relations with Bangladesh and that blocks its constructing a gas pipeline from Myanmar.(73)

There are concerns that whatever developments occur in the bordering region of Myanmar have direct impact on India's Northeastern region. Such as the case of Manipur, situated near Sangaing division, northwestern border of Myanmar, which directly gets affected by whatsoever takes place because they share a very porous border and cross-border interaction among people is very active. A leader-in-exile of Myanmar's National League for Democracy, Dr. Tint Swe, said during a discussion at the Manipur Press Club that India's 'Look East' Policy was formulated to counter Chinese influence besides engaging the military junta in Myanmar to resolve ethnic unrest along the border areas. Dr. Swe said that India needed to take care of its Northeast before it looked beyond. "India needs to frame afresh its policies towards Myanmar taking into account the shifting policies and political system in Myanmar, he added.(74)

India has been encouraged by Myanmar officials to assist them in political affairs, especially matters relating to democracy. It is presently conducting an e-government project to train government officials there.(75) However, despite positive developments between India and Myanmar and India and ASEAN, connectivity between them is still poor. The ASEAN countries are still not comfortable with the idea of advancing cooperation in defence and security areas due to the China factor. Major impediment between India and Myanmar is lack of development in India's Northeast region which is an integral part of India's Look East Policy as a key driving force and staging post for the policy. The continued insurgencies need to be resolved.(76)

India has developed a workable relationship with China as there is a mutual sense about not confronting each other but both of them are preparing to face stiff competition from each other rather than a conflict. The increasing importance of maritime trade and energy security for both India and China has made it necessary to secure sealanes of communication (SLOC) in Southeast

Asia. India is dependent on sealanes for about 97 per cent of its global trade and the safety of sealanes for both India and ASEAN is highly important.(77)

The 21st century has come with new themes and trends where Southeast Asia has become important to the US and Myanmar is one attraction. Myanmar surprised the international community by showing a change in its official behaviour when it released political prisoners, lifted censorship, and the military rulers met with the opposition in a highly publicized meeting with the prominent leader Aung San SuuKyi, signed peace agreements with two rebellious minorities on the borderlands and welcomed back the United Nations special envoy to Myanmar. Therefore, Myanmar's isolation in international community has started to recede gradually. The US and European Union are looking forward to engaging with Myanmar.(78)

America's emerging interests in Myanmar and Asia-Pacific, though generally due to Myanmar's location where it neighbours the Asian giants India and China, and maritime gateway for Chinese interests, are seen in the region with a mixed feeling of relief and concern. India had been critical of the sanctions imposed by the US and European Union as it left no choice for Myanmar but to rely on China. Lately the then secretary of state Hillary Clinton and President Obama's visit to Myanmar and Myanmar's decision of halting the Mysitone Dam project undertaken by China has irked China. President Obama's message was that the US was "here to stay" as a Pacific power and there is a new trade alliance in the queue which probably excludes China. All this has created annoyance in Beijing. There is an opinion in the West that the US needs to be careful and not antagonize China which has great leverage over Myanmar. The United States evolving interests in Myanmar and the region as a whole not only gives it access to the Indian Ocean but serves as a counterweight to China. For the US, China's emergence as world's largest economy in the coming years poses the biggest challenge.(79)

China disagrees with the opinion of Washington officials that the US is not interested in countering Chinese influence there. Chinese state-run newspaper the *Global Times* warned that "Beijing would not accept seeing its interests stamped on" though it does not stop Myanmar from improving its relations with the West. In fact, China views US engagement with Myanmar as a sign of benefit where Myanmar would be under no sanctions and Chinese business will flourish in a normalised environment.(80) As China confronts socio-economic, regional and international challenges, any rift engineered by the US in countering China through India in Myanmar and the region will create instability.

Not only China but the ASEAN countries also, though once concerned over increasing Chinese interests in the region, get worried about India-China competition and India's growing economic and military clout in the region. Now with the US coming into the region as an internationally dominating power, it would be difficult to ignore the prospects of US encouraging India to act get more assertive and more visibly as a regional power against China in the region. This kind of scenario would instil apprehensions of insecurity and instability among the smaller ASEAN countries. Therefore, United States' shifting stance

towards Myanmar and Myanmar's shifting policies towards its giant neighbours creates a sense of insecurity among the regional actors; in particular, China which will most probably make Myanmar a battleground with India to contest their interests in the country.

Conclusion

Probably the first thing that comes to mind on mentioning Asia is China and India, though the Southeast Asian region comprises of ten most economically thriving countries which are overshadowed by these two giant neighbours. These countries occupy the best strategic location on the map with abundance of natural resources. Economically, these resources integrate to contribute to the booming of each country and to the region as a whole, making it an economic hub. Politically, the region provides stability in this part of the world which is rapidly reshaping the global balance of power. Myanmar is part of this reshaping region which is getting attention of not just these two regional giants but the international community as well.

The arguments discussed in the paper point out that it was China's growing presence in Myanmar that mainly alerted India and left it nervous. This gave birth to India's 'Look East' Policy in the 1990's which is still an important part of its foreign policy in dealing with Myanmar and the region beyond. In pursuing this policy India faces tough competition from China, actively present in Myanmar and the Ocean. Although Chinese presence in Myanmar did not interfere with its having good relations with India and their bilateral trade is expected to reach $3 billion by 2015, the figure still remains half that of present Myanmar-China volume.

China has always looked at Myanmar through strategic lens while India's Myanmar policy prior to the 'Look East' shift focused on issues of democracy and human rights, which led to a long decade of frosty relations. For China Myanmar is an answer to the development requirements of its western provinces which are lagging behind economically compared to the developed eastern provinces that have the advantage of being on the sea routes. China's foreign policies are based on pragmatic approach: state-to-state relations irrespective of a country's internal government system. So it has ties with both democracies and dictatorships. Myanmar is strategically important to China which regards its stability as a factor of utmost importance.

For India to address neglected areas of its bilateral relations with Myanmar, the Indian government needs to engage with insurgents for political dialogue to achieve a peaceful solution to the decades old issues in the region and the same goes for the Myanmar government. The problem with India's 'look east' policy is that to date there has been almost no role for the Northeastern states which is in sharp contrast to China's Yunnan province which is playing an active role in national pursuit of cultivating closer relations with neighbours. The people of India's Northeastern region should also be integrated into the mainstream politics. Besides a dialogue, there is a dire need to have development projects where the local people are also involved. Both India and Myanmar can utilize the potential of shared ethnicity for pursuing peace in both

countries' troubled border region. India can take off from the encouraging push given it by Myanmar involving it in nurturing the newborn democracy.

Besides the bilateral balancing of relationships, a triangular balance among India-Myanmar-China is equally imperative. China with prospects of emerging as the world's top economic power within the next decade cannot be confronted aggressively. Therefore, along with competition India needs to keep a balance in its ties with Myanmar and China where the traditional ally of Myanmar does not get offended to the extent of being sidelined. If this kind of situation emerges then the security of both India and Myanmar could get vulnerable, not to mention the tension and unease it would bring to the other smaller Southeast Asian countries. Moreover, if Myanmar also carefully balances its relations with both of its giant neighbours in the changing regional and global situation, then the regional security and development outlook may not be as uncertain as some observers believe.

The India-Myanmar-China triangle can be utilized strategically well by balancing each side's interests and ambitions. Moreover, the triangle can also be converted into platforms for global geo-political transformation where they can together shape an 'Asian Era' of the 21st century. Despite their growing mutual competition, India and China have become closer to each other to a certain extent or rather dependent on each other for their national interests in this multi-aligned global system. China and India's interests are bound to converge and their mutual cooperation in particular in Myanmar is in the region's interest as well. The rational decision both countries took in the past in putting bilateral disputes on the back burner and pursuing economic relations first have given them a standing role to play in future regional transformation.

Notes and References

1. Stephen M. Walt, "Alliance Formation and the Balance of World Power", *International Security*, Vol. 9, No. 4 (Spring, 1985), p. 8-9. <http://links.jstor.org/sici?sici=0162-2889%28198521%299%3A4%3C3%3AAFATBO%3E2.0.CO%3B2-K>.
2. Ibid, p.9.
3. Ibid, p.10-11.
4. Ibid, p.11.
5. Ibid, p.12-13.
6. Ibid, p.24.
7. Ibid, p.25-26.
8. Ibid, p.27.
9. Ibid.
10. Ibid, p.28-29.
11. Ibid, p.30.
12. Andrew Selth, "Burma's China Connection and the Indian Ocean Region", Strategic and Defence Studies Centre, Working Paper No.377, September, 2003, p.1-23.
13. "Geography", <http://geography.about.com/library/cia/blcburma.htm>.
14. Ramesh Thakur, "Between East and West, From South to North," in *India Looks East: An Emerging Power and its Asia-Pacific Neighbors*, ed. Sandy Gordon and Stephen Henningham, Canberra: Strategic and Defence Studies Centre, 1995, p.17.
15. V.P Dutt, *India's Foreign Policy in a Changing World,* (New Delhi), Vikas Publishing House Pvt. Ltd., 1999, p.229.
16. Ibid.
17. Andrew Selth, "The China-Burma-India 'Triangle'", in *India Looks East: …* op.cit., ref 12, p.192.
18. J. Mohan Malik, "Sino-Indian Relations and India's Eastern Strategy" in *India Looks East:*…, op.cit., ref.14, p.148.
19. David Scott, "The Great Power 'Great Game' between India and China: 'The Logic of Geography'", *Geopolitics*, No.13, Routledge (London: 2008), p.1-26.
20. Col. (retd.) Hariharan, "India-Myanmar-China Relations", *Asian Tribune*, 22 July 2007, <http://www.asiantribune.com/index.php?q=node/6641>.
21. Dutt, op.cit., ref.15, p.227.
22. Gunjan Singh and Avinash Godbole, "China's Relations with South Asia: Why is India Weary?," *Harvard Asia Quarterly*, Vol.XIII, No.1 (Spring 2011), p.32-40.
23. Selth, op.cit., ref.12, p.1-23.
24. Singh and Godbole, op.cit., ref.22, p.32-40.
25. Dutt, op.cit., ref.15, p.231.
26. Selth, op.cit., ref.12, p.1-23.
27. "Coco Islands", <http://www.fas.org/irp/world/china/facilities/coco.htm>.
28. Selth, op.cit., ref.12, p.1-23.
29. Singh and Godbole, op.cit., ref.22, p.32-40.
30. Selth, op.cit., ref.12, p.1-23.
31. Hariharan, op.cit., ref.20.
32. Anna Louise Strachan, Harnit Kaur Kang and Tuli Sinha, "India's Look East Policy: A Critical Assessment," Institute of Peace and Conflict Studies, Special Report, October 2009, <http://www.ipcs.org/pdf_file/issue/SR85-SEARPInterview-Sikri1.pdf>.
33. Ibid.
34. Thongkholal Haokip, "India's Look East Policy," *International Journal of Ideas*, Vol.24, No.291, May 2011, p.7-11.
35. "India-Myanmar Relations Infused New Momentum: Analysis on India's Foreign Policy on Burma (Myanmar)", *Indo-Burma News*,

<http://www.indoburmanews.net/archives-1/archive06/323/354/>, accessed in November 2012.

36. Pradip Saikia, "North-East India as a Factor in India's Diplomatic Engagement with Myanmar: Issues and Challenges", *Strategic Analysis*, Vol.33, No.6, November 2009, Routledge, p.877-889.
37. Hanna Ingber, "India Mums the word on Burma", *Global Post*, 5 November 2010, <http://www.globalpost.com/dispatch/india/101105/myanmar-burma-relations>.
38. Saurabh Shukla, "Aung San Suu Kyi wants India to play a key role in democratisation of Myanmar," *India Today*, <http://indiatoday.intoday.in/story/aung-san-suu-kyi-india-democratisation-myanmar/1/229150.html>.
39. "Won't Allow Anti-India Groups in Our Territory: Myanmar," *Outlook India*, 3 January 2013, <http://news.outlookindia.com/items.aspx?artid=785741>.
40. Saikia, op.cit., ref.36, p.877-889.
41. Saurabh, "Dynamics of Indo-Myanmar Economic Ties", Institute of Defence Studies and Analysis, 06 January 2010, <http://idsa.in/idsacomments/DynamicsofIndo-MyanmarEconomicTies_saurabh_060110>.
42. "India-Myanmar trade likely to double by 2015: CII", *The Economic Times*, 27 May 2012, <http://economictimes.indiatimes.com/news/economy/foreign-trade/india-myanmar-trade-likely-to-double-by-2015-cii/articleshow/13557123.cms>.
43. Arvind Gupta, "Myanmar's Critical Role in Bolstering India's Look East Policy", Institute of Defence Studies and Analysis, 02 February 2012, <http://www.idsa.in/idsacomments/MyanmarsCriticalRoleinBolsteringIndiasLookEastPolicy_agupta_020212>.
44. Saurabh, op.cit., ref.41.
45. Haokip, op.cit., ref.34, p.7-11.
46. Gupta, op.cit., ref.43.
47. "Spotlight: Myanmar's Controversial Oil and Gas Industry", 13 November 2012, <http://www.offshore-technology.com/features/featurespotlight-myanmar-controversial-oil-gas-industry-abuse>.
48. "Myanmar – An Emerging Natural Resources Powerhouse," <www.globaldata.com>, 8 October 2012, <http://www.globaldata.com/PressReleaseDetails.aspx?PRID=418&Type=Industry&Title=Mining>.
49. Saikia, op.cit., ref.36, p.877-889.
50. Hariharan, op.cit., ref.20.
51. Gupta, op.cit., ref.43.
52. Namrata Goswami, "Enlisting Myanmar's help in Tackling North-East Guerillas," Institute of Defence Studies and Analysis, 18 February 2009, <http://www.idsa.in/idsastrategiccomments/EnlistingMyanmarshelpintacklingNorthEastGuerrillas_NGoswami_180209>.
53. Saikia, op.cit., ref.36, p.877-889.
54. *Indo-Burma News*, op.cit., ref.35.
55. Saikia, op.cit., ref.36, p.877-889.
56. Goswami, op.cit., ref.52.
57. Saikia, op.cit., ref.36, p.877-889.
58. Mohit Anand, "India-ASEAN Relations," Institute of Peace and Conflict Studies, Special Report, May 2009, <http://www.ipcs.org/pdf_file/issue/SR72-Final.pdf>.
59. Ibid.
60. Poon Kim Shee, "The Political Economy of China-Myanmar Relations: Strategic and Economic Dimensions," *Ritsumeikan Annual Review of International Studies,* Vol.1, 2002, p.33-53, <http://www.ritsumei.ac.jp/acd/cg/ir/college/bulletin/e-vol1/1-3shee.pdf>.
61. Malik, op.cit., ref.18, p.153-154.
62. Ibid, p.154.
63. Anand, op.cit., ref.58.
64. Selth, op.cit., ref.17, p.197-198.
65. Saurabh, op.cit., ref.41.

66. Chietigj Bajpaee, "'Spillover' in the Sino-Indian Relationship: An Indian Perspective", *China Brief*, Vol.12, Issue 24, 4 December 2012, <http://www.jamestown.org/single/?no_cache=1&tx_ttnews[tt_news]=40243&tx_ttnews[backPid]=589>.
67. Sanjay Kumar, "India's Shameful Burma Ploy," *The Diplomat*, 12 August 2010, <http://thediplomat.com/2010/08/12/india%E2%80%99s-shameful-burma-ploy/>.
68. NehginpaoKipgen, "Burma's Balancing Acts with India and China", www.theepochtimes.com, 11 October 2011, <http://www.theepochtimes.com/n2/opinion/burmas-balancing-acts-with-india-and-china-62661.html>.
69. Kumar, op.cit., ref.67.
70. Medha Chaturvedi, "India's Strategic Interests in Myanmar", Institute of Peace and Conflict Studies, Special Report 98, February 2011, <http://www.ipcs.org/pdf_file/issue/SR98-ShyamSaranInterview.pdf>.
71. John Feffer, "Giants India, China Eye Burma," <http://www.ipsnewsasia.net/bridgesfromasia/node/120>.
72. Simon Roughneen, "Asian Giants revise Myanmar Policy," *The Irrawaddy,* 1 January 2013, <http://www.irrawaddy.org/archives/22757>
73. Zhao Hong, "China and India's Competitive Relations with Myanmar", Institute of China Studies, Working Paper No.2008-7, (April 2008), p.1-15, <http://ics.um.edu.my/images/ics/workingpaper/2008-7.pdf>.
74. "India's Look East Policy formulated during junta era needs change," Burma Centre, Delhi, 3 May 2012, <http://burmacentredelhi.org/india-burma-relation/recommended-articles/2307--indias-look-east-policy-formulated-during-junta-era-needs-change-article.html>.
75. Feffer, op.cit., ref.71.
76. Gupta, op.cit., ref.43.
77. Anand, op.cit., ref.58.
78. Douglas H. Patel, "Myanmar: Time for a Change", Carnegie Endowment, *Asia Pacific Brief*, 28 October 2011, <http://carnegieendowment.org/2011/10/28/myanmar-time-for-change/699v>.
79. Jason Burke and Tania Branigan, "India and China move to protect Burmese interests from US influence," *The Guardian*, London, 1 December 2011, <http://www.guardian.co.uk/world/2011/dec/01/india-china-move-to-protect-burmese-interests>.
80. Ibid.

GUJARAT ELECTIONS, 2012: AN APPRAISAL

I am proud that I am a human, and I am a Hindu/every moment I experience I am big, wide, I am Sindhu.[1]

— Narendra Damodardas Modi
Chief Minister of Gujarat

M. SHAHBAZ SAEED

Introduction

The state of Gujarat was a part of the Bombay Presidency during the British colonial rule. After independence, however, the Bombay Presidency was divided into two new states, Gujarat and Maharashtra. On the first of May 1960 Gujarat became a separate state within the Republic of India.[2]

There are two major political parties in Gujarat, the Bharatiya Janata Party (BJP) and the Indian National Congress. Over the years, only these two parties have had a strong political hold in the state. From 1960 onwards Congress dominated the state politics until 1995 when the BJP took over. The Congress currently is the main opposition party. The BJP has thus been the majority party since 1995. Keshubhai Patel was the chief minister of Gujarat from March 1995 to 2001.[3] Patel resigned in 2001 due to poor performance of the BJP in a bye-election. Following the resignation Narendra Modi became the chief minister for the first time on the first of October 2001 and has since retained the office. Although Modi belongs to one of the most important mainstream political parties, the election in Gujarat has completely been dominated by political personality cults; and Modi is a cult in the state. It is generally known that "BJP is Modi, and Modi is BJP."[4] His leadership has led Gujarat to economic development, and turned it into one of India's economic powerhouses. Now Modi projects himself as the face of a democratic and

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economically strong India. On 20 December 2012 Modi won a third consecutive state election.[5]

Modi is the longest serving chief minister of Gujarat. He is controversial as well as a popular political icon not just in Gujarat but all over India. Not only the vast section of civil society and The Bharatiya Janata Party (BJP)'s followers consider him the next prime minister of India, the European Union has also ended its decade-long accusations and boycott of Modi on the ground that there is no clear evidence of his involvement in the 2002 Gurjarat genocide.[6]

The paper attempts to explore the reasons behind Modi's third consecutive victory, including examining the economic growth and development in Gujarat under his rule. It will further focus on the role of the Muslim community in the election. It is also significant to understand the causes of the poor performance of the Indian National Congress in Gujarat. In addition, the paper also analyzes the effect of the latest elections on the upcoming Lok Sabha polls. Finally, it will highlight the prospects of Modi as a candidate for next prime minister of India. Before taking up these questions, it seems pertinent to have an overview of Gujarat.

Gujarat

Gujarat is located on the coast of the Arabian Sea. The state shares an international border with Pakistan. India and Pakistan have dispute over Sir Creek, which lies on their common border. Gujarat can be divided into three geographic regions, Kuchh, the Kathiawar Peninsula, and mainland Gujarat.[7]

Gujarat is India's 10th largest state with a population of 60,383,628. Hinduism is the most dominant religion. 89.1 per cent of the population is Hindu while 9.1 per cent is Muslim. Gujarati is one of the 22 official languages in India. According to the latest census (2011), male literacy rate in Gujarat is 87.23 per cent while female literacy rate is 70.73 per cent.[8]

Election schedule, issues & campaign

Gujarat has 182 assembly constituencies and 26 parliamentary constituencies. The Election Commission of India (ECI) announced the election schedule on 3 October 2012 and polls in Gujarat took place in two phases; first phase on 13 December 2012 and the second on 17 December.[9]

Both BJP and the Congress designed their election strategy carefully and tactfully. The 2002 and 2007 Gujarat elections were held in the background of the 2002 Hindu-Muslim riots. As already mentioned, Modi was chief minister during the riots. According to allegations, he provoked, or at least allowed, the massacres that killed thousands of men, women, and children; most of them were Muslims. Some 10 years after the riots Modi propagated 'Sadbhavna mission' (goodwill journey) which was a series of 36 fasts. According to Modi, this was "aimed to strengthen the atmosphere of peace, unity and harmony in the state" The mission was started on Modi's birthday on 17 September 2011 at Ahmedabad, and ended in Ambaji on 12 February the next year.[10]

The manifestos of the two main political parties, the BJP and the Congress, for the assembly elections in Gujarat were almost the same with specific emphasis on basic facilities like education, health, agriculture, housing, etc.

BJP election campaign

Modi launched his election campaign from Gandhinagar on 19 November by addressing rallies. During the campaign, Congress party spokesperson Rashid Alvi said, it is not necessary that 2002 riots will be an election issue for the Congress party this time.[11] The BJP tried to cash in on the burning issues of inflation and corruption of the central government.

The manifesto

The BJP released its election manifesto on 3 December 2012. Its main points include the following promises:

- Growth in agriculture
- Employment
- Improving health facilities
- Cheap housing for the poor
- Greater job opportunities for more than 30 lakh youths of the state if voted back to power
- Establishing new superspecialty hospitals
- Providing safe drinking water
- Developing agro infrastructure
- Job opportunities for women.[12]

In the election campaign, the BJP focused on basics like health, employment, agriculture, drinking water, and Jobs. Another 'popular' point made by the BJP was its 'anti-Pakistan' objectives. This time around Modi picked up the Sir Creek issue and wrote a letter to the prime minister demanding that India stop dialogue with Pakistan on the Sir Creek issue. During the election campaign, unlike the past, the BJP didn't target the Muslims. It marketed itself as the party that could develop India effectively and counter all sorts of threats. The BJP tried to attract the extremists by its hardliner stance.

Congress election campaign

National leaders of the Congress party including Prime Minister Manmohan Singh, Sonia Gandhi, and Rahul Gandhi campaigned in the state, where the party is out of power since 1995. They couldn't achieve any success, though.[13]

On 4 December Delhi Chief Minister Sheila Dikshit and Gujarat Pradesh Congress Committee chief Arjun Modhwadia released Congress election manifesto. The main points are as under:

The manifesto

- Industries in backward region; 85 per cent local employment is compulsory.
- Investment to be attracted for sea coast tourism.
- Upto Rs 2 lakh insurance cover, 250 medicines to be free and a medical corporation to be set up.
- Right to forest land; law to be implemented in six months.
- SC, ST, OBC scholarship to be doubled.
- 50 unit free power for residential connections.
- Narmada project to be completed.
- Small dams and irrigation schemes to be introduced.
- Bio-diesel bank: to use wasteland for the production of bio-diesel.
- Cotton export centre at Manavadar; Mango export center at Talala
- Tax on agri equipment, tools, tractors to be reviewed and tax relief given.
- Interest-free loan to students for higher education.
- Tablet PC for students who pass the 10^{th} class and laptops for students who pass the 12th.
- Crop insurance cover for all farmers
- Agritech mission under the chairmanship of the CM to increase agricultural production.
- 2 lakh new connections for farms every year.
- A public accountability law to be enacted and enforced.
- 62,000 posts vacant in state; huge backlog of other vacancies too. All vacancies to be filled within one year.
- Ship-breaking industry to be revived.
- Vacancies of teachers to be filled in all primary schools.
- Job opportunities for sportsperson with state-level good performances.
- Ferry service to connect the state with Maharashra through the sea.
- Large dams to be developed as tourist attraction.
- Special scholarships for poor students qualifying for national-level institutes like IIM, IIT, and NID.
- Fully equipped mobile clinics for faraway places with high tribal population.
- Street lights free for villages with population less than 500; 50 per cent concession for villages having population above than that figure.[(14)]

It was an ordinary manifesto for nothing concrete was offered to the voters from different sections of society. Being a ruling party at the Centre, it

was difficult and unwise for them to make unrealistic promises such as jobs and economic benefits to the common man.

Voter turnout

Total registered voters in Gujarat are 3.80 billion — 62 per cent of the total population of the state. Some 1,666 candidates took part in the two-phase elections to the state assembly.[15] The voter turnout was high. Chief electoral officer (CEO) Anita Karwal said "the turnout in the 2012 polls, 71.3 per cent, is the highest-ever registered in the state," "Among the many factors responsible was the voters' slips distributed by the election authorities and the awareness campaign undertaken by the EC and voluntary organizations. It brought the people to the polling booths."[16] In the previous assembly elections, the turnout was 61.5 per cent in 2002 and 59.8 per cent in 2007; whereas, in the parliamentary elections (Lok Sabha), it was 45.2 per cent in 2004 and 47.9 per cent in 2009. In the December 2012 assembly elections, the turnout was 71.3 per cent.[17]

Votes won by the BJP and the Congress are given below;[18]

Party	Vote Share %	Change % from 2007
BJP	48	-1
Congress	40	0

Election results and formation of government

Assembly election results declared on 20 December Modi-led BJP won the third consecutive term. The party won 115 out of 182 seats, while the Congress won 61 seats. On 26 December 2012, Modi took the oath administered by Governor Kamla Beniwal at Sardar Patel Stadium, and formed the government.[19]

Election Results 2012

Party	Won	Leading	Total
Bharatiya Janata Party	115	0	115
Indian National Congress	61	0	61
Nationalist Congress Party	2	0	2
Janata Dal (United)	1	0	1
Others	3	0	3

Source: <http://zeenews.india.com/state-election-2012/gujarat/gujarat-election-results-2012-narendra-modi-baiters-bite-the-dust_817882.html>.

In 2002 the BJP won 127 and in 2007, 117 seats, whereas the Congress got 59 seats in 2007 and 51 in the 2002 elections. In this election, the BJP lost 16 seats by a margin of less than 2 per cent. However, the Congress won 46 per cent seats with a margin of less than 5 per cent. Sixteen women candidates were elected; 12 of them belonged to the BJP and four to the Congress.[20]

Result analysis

There was no anti-incumbency factor in Gujarat. In fact, the Congress played a major role in BJP's victory. It tried to damage the BJP but failed and lost the elections again. There are a number of causes of Congress' weakness in the state; the most important one is the lack of a strong state leadership. Congress made the same mistake as it made in the Uttar Pradesh elections. Most analysts attribute its poor performance to its inability to nominate a chief ministerial candidate well ahead of the elections. In fact, it has no leader in Gujarat of Modi's stature. It was relying on Shanker Singh Waghela, as he has been the chief minister of Gujarat from 1996 to 1997 besides being a former union textile minister. Waghela was chairman of the party's election campaign committee. Popularly called "Bapu" (father), he is a crowd-puller and a popular leader among Kshatriyas and other backward classes (OBCs). But the party failed to cash in on his skills completely as many Congress figures treat him as an outsider. He is also notorious among the Gujaratis as a corrupt and dishonest CM.

Muslims of Gujarat

Interestingly, the BJP performed well in most constituencies with a high Muslim population, and managed 12 out of the 19 seats which had Muslim voters as the determining factor. Although Muslims comprise 9 per cent of Gujarat's 60 million population, when it comes to representation in the state legislature, only two of them (from Congress) were elected to the 182-seat assembly in the 2012 elections.[21]

Ironically, in the 2007 state elections, total Muslim winners were five; but all of them were from the Congress. To avoid annoying the Hindu voter, the BJP has never fielded any Muslim candidate in the state elections.

Poor Representation

Muslim MLAs in Gujarat	
2012	2 (Cong)
2007	5 (Cong)
2002	3 (Cong)
1998	4 (Cong)
1995	1 (Ind)
1990	1 (Cong)
1985	7 (Cong)

Source: <http://www.hindustantimes.com/Specials/Coverage/Gujarat-Assembly-Elections-2012/Chunk-HT-UI-GujaratAssemblyElections2012-TopStories/A-couple-of-token-Muslims-in-House-but-Gujarat-doesn-t-care/SP-Article10-979185.aspx>.

In 1990, when there was a nationwide wave against the Congress, only one Muslim candidate got elected. It was a major decline from the seven Muslim MLA's in 1985. A prominent Muslim leader in Gujarat, Asifa Khan, who defected from the Congress to the BJP, said: "The BJP legislators are doing more for the Muslims. The idea behind chief minister Narendra Modi's Sadhbhavana Yatra was to bring Muslims back to the mainstream."[22]

The only serious attempt to win Muslims over to the BJP was made by Modi with his Sadbhavna programmes. But this was after eight years of running Gujarat on an anti-Muslim platform. Modi fought two assembly elections and two Lok Sabha elections on the theme of *Hum panch hamare pachees*, (1 Muslim husband X 4 wives = 25 children), and relief camps (set up for riot-stricken Muslims) as 'baby producing factories.' Gujarat has not sent a single Muslim to the Lok Sabha for over 20 years.[23]

In 2010, Muslims supported the BJP in the civic polls in which the party swept all the six municipal corporations on account of 30 per cent Muslims voting for it.[24] This tremendous political transformation came after eight years of the Gujarat massacre of 2002. But, somehow, the larger section of Muslim community remains distrustful of Modi. Despite his Sadbhavna stage shows, the Muslims know that, at the root, Modi has no sympathy for the minorities. Modi's fasting and Sadbhavna meetings were well-managed events where many bearded people with caps came on the stage pledging allegiance of loyalty to Modi. But at the same time, Modi got exposed as he refused to wear a cap offered by a Muslim. Disappointment also came when Modi did not award any election ticket to the Muslim community even after Sadbhavana.[25]

While mentioning another viewpoint, retired Indian Supreme Court Judge Katju wrote an article in a Pakistani newspaper, *The Express Tribune*, in which he condemned the Narendra Modi-led government, and said that Muslims did not feel safe under his rule. He said: "The truth is that Muslims in Gujarat fear that if they speak out against the horrors of 2002, they may be attacked and victimised. In the whole of India, Muslims (who are over 200 million of the people of India) are solidly against Modi."[26]

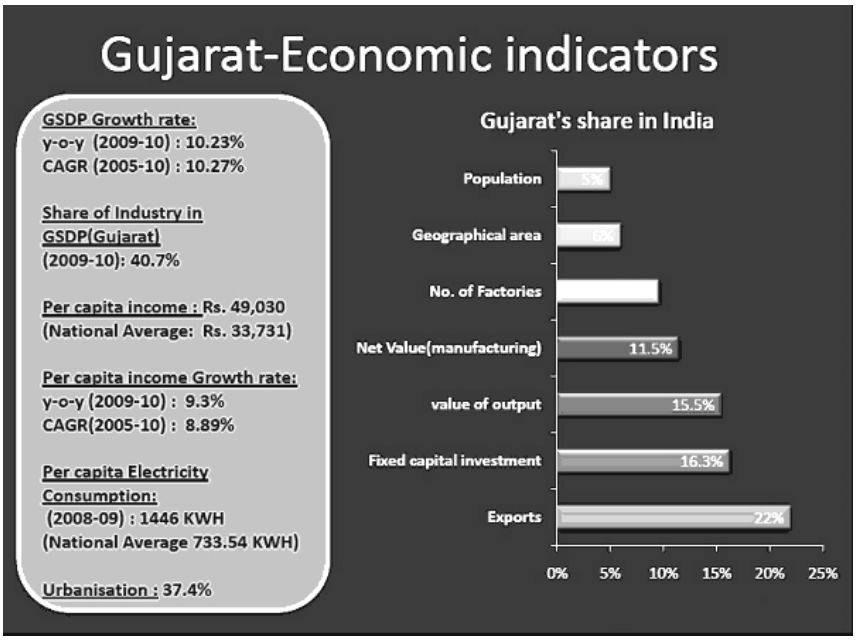
Economic progress under Modi's rule

Modi is attempting to project himself as a generous politician with a track record that proves he could be the one to get India's economy back on track. Gujarat is the only state in India where consumers get an uninterrupted power supply for nearly 24 hours a day. In 10 years, Gujarat's auto mobile industry has grown from one modest plant to an expected capacity of 700,000 cars in 2014, including billion-dollar investments announced last year by Ford and Peugeot.[27]

India's business community is supportive of Narendra Modi, in advance of India's next general elections. Their backing was obvious, for the chairmen of some of the country's biggest companies, led by Ratan Tata of the Tata Group, along with ambassadors, said that they prefer red Modi's style of leadership in India. Businessmen said that Modi was the sort of leader India needed, and that they would welcome him as prime minister. Modi is seen as a rare example of a chief minister without involvement in bribes or extortion.[28]

For example, Tata said he was grateful to Modi for providing him with land for his company's Nano mini-car factory. Nano investment came to Gujarat more than four years ago, after political hassles in West Bengal. The Tata Group also has major chemical, power and other interests in Gujarat. Mukesh Ambani, who runs Reliance Industries (RIL), another leading group with big stakes in

Gujarat, praised Modi as a "leader with a grand vision". Anand Mahindra, the chairman of the Mahindra car-and-tractor group, said that Gujarat compared favourably with China "in terms of deliverables."[29] Chanda Kochhar, the CEO of ICICI, a leading financial-services business, praised Modi's state as "one of the fastest-growing regions in the world". Together these leaders represent the elite within the business elite. Jahangir Aziz, senior Asia economist said, "Under Modi's government, there has been significant improvement in infrastructure growth, significant improvement in industrialization, as well as agriculture."[30]



Source: CMIE, Socio-Economic Review: 2010-11

Hindutva, Modi, and prime ministership of secular India

Despite a controversial past as discussed earlier, Modi has established a reputation of an economic reformer. His prime ministerial ambitions have come at a time when Hindutva politics is losing its national appeal in India. At present, even hardcore RSS sympathizers only pay lip service to Ayodhya and the 'mandir vaheen Banayenge' slogan. Modi realised that Gujarat alone could never make him prime minister because the state has only 26 Lok Sabha seats.[31] Moreover, Gujarat is inclined to communal politics where Muslims are barely 10 per cent of total population. It pays to inflame the 90 per cent against the 10 per cent. But such a tactic can never work in states like Assam with Muslim population of 31 per cent, or West Bengal (25 per cent), Bihar (18 per cent), or UP (19 per cent).[32] These are the states that send about 200 members to the Lok

Sabha. Modi is trying to project himself acceptable to both Hindus and Muslims following in the footsteps of Atal Bihari Vajpayee. Modi fielded no Muslim candidate for the 182 seats in the state assembly elections. This is proof enough that he is not secular. One more issue is that the BJP is faced with a leadership crisis. In the absence of leaders like Vajpayee, Jaswant Singh, Yashwant Sinha, Pramod Mahajan, L.K Advani, and the most prominent Hindutva face, Bal Thakray's death now means that the BJP is losing its grip on national politics. In other words the party cannot produce a strong, visible, and charismatic high command at the centre.

Another problem with Modi is that internationally he remains a controversial figure, even after a decade of the 2002 riots. The United States has not allowed him entry into the country, although the United Kingdom recently renewed relations with the Gujarat government after a gap of some years. It remains to be seen how India's relations with Pakistan will be affected should Modi become prime minister.

Modi and Pakistan

If a BJP-led coalition wins majority seats in the Lok Sabha in 2014 and Modi becomes the prime minister of India, this will have a direct impact on Indo-Pakistan relations. It is appropriate here to understand Modi's policy designs vis-à-vis Pakistan. His statement on the killing of Osama bin Ladan on Pakistani soil is helpful in understanding his approach towards Pakistan. He stated: "It is time that Indian government bring together all humanitarian forces of the world to form a group against Pakistan to defeat terrorism."[(33)] This statement also reflects that Modi being Indian premier would be a threat to regional peace, security, and development, staking the lives of millions of innocent civilians.

On the occasion of Pakistan's former interior minister Rehman Malik's visit to India, on 15 December 2012, Modi wrote a letter to the prime minister of India:

> I am writing on a serious issue of talks being held on Sir Creek being handed over to Pakistan. Any attempt to hand over Sir Creek to Pakistan would be a strategic blunder considering the history and sensitivity of the region. I would earnestly request you to stop this dialogue with Pakistan at once and Sir Creek should not be handed over to Pakistan. I am writing to you at this juncture as I was told that a decision is being taken on Sir Creek issue on December 15. I would request you to stop taking any decision on this crucial issue on December 15th. After the elections are over in Gujarat, I shall seek your time to discuss this issue with you.[(34)]

Though there is an assumption that this letter was an election stunt, yet it shows that for his own interest he can exploit the situation as he did over the recent Line of Control (LoC) clashes. After the LoC incidents, the 22-member delegation from the Karachi Chamber of Commerce and Industry that had gone

to Ahmedabad for the three-day 'Vibrant Gujarat' conference was asked by Modi to leave. Gujarat government officials said that the presence of the Pakistani delegation at the conference would have embarrassed the BJP leadership as it had taken a strong position against the Centre's response to the LoC ceasefire violation. The Pakistani guests who were expected to attend the inaugural session of the conference, were asked to stay indoors at their hotel in Ahmedabad and were even not allowed to go sightseeing.(35)

Modi concluded his election campaign for the 2012 Gujarat Assembly elections on 15 December 2012 with these words: "If Sardar Patel was alive, Afzal Guru would have been hanged very promptly and Pakistan would never have asked for Sir Creek."(36)

Conclusion

Gujarat's chief minister has emerged as a strong candidate for prime minister of India. Now Modi is trying to reshape his image. His approach seems to be working in Gujarat, but such an autocratic style would be difficult to apply at the national level, especially in an era of coalition governments.

After Modi's 2007 victory, there were same sentiments, opinions and statements that he would become the next prime minister after the 2009 Lok Sabha elections. However, the Congress-led United Progressive Alliance (UPA), won the elections ending all such speculations. Now again, in 2013, there is almost the same atmosphere, and some observers believe that Modi could become the next prime minister; but it is not an easy task specially when Hindutva forces are weakening and support for right-wing political parties like the BJP is dwindling. Moreover, Modi has not proved to be a successful national level player to muster the support of as many parties as required for the National Democratic Alliance (NDA) to form a government.

If we examine Modi's economic achievements, we notice that Gujarat's development narratives are no longer any secret now. Modi has been praised by all for his impressive and positive approach towards the industrial sector of the country. Big names such as mentioned above all share good relations with the Gujarat chief minister.(37)

On India-Pakistan relations, however, the crucial question still remains unanswered: What will be Modi's deportment if he becomes the Prime Minister of India.

Notes and References

1. Leena Misra, "In rhyme, it's I, me, mine," *Times of India,* New Delhi, 7 December 2007.
2. States of India, <http://www.statoids.com/uin.html>.
3. Press Trust of India, "Gujarat polls: Keshubhai Patel hits out at Narendra Modi over 3D campaign," <http://ibnlive.in.com/news/gujarat-polls-keshubhai-patel-hits-out-at-narendra-modi-over-3d-campaign/307373-37-170.html>.
4. "Modi to be sworn in as Chief Minister on 26 December," *The Hindu*, Delhi, 21 December 2012.
5. PTI, "Elections 2012 results: Modi scores hat-trick in Gujarat, Congress wins Himachal," *The Times of India,* 20 December 2012.

6. "EU has ended Narendra Modi Boycott, hints German envoy Michael Steiner," *The Economic Times*, Ahmedabad, 9 February 2013.
7. <http://www.gujarat-tourism.net/Gujarat_Information.htm>.
8. Ibid.
9. "Gujarat polls on December 13, 17; Himachal on 4 November," *The Economics Times*, 3 October 2013.
10. "Sadbhavana Mission concludes at temple town of Ambaji," 12 February 2012, <http://www.narendramodi.in/gujarat-chief-minister-concludes-sadbhavana-mission-at-temple-town-of-ambaji/>.
11. <http://article.wn.com/view/2013/03/03/Congress_condemns_Modis_attack_on_party_over_graft_charges_a/#/related_news>.
12. "Gujarat polls 2012: Nerandra Modi Releases his Manifesto," <http://indiatoday.intoday.in/gallery/gujarat-polls-2012-narendra-modi-releases-bjp-manifesto/1/8307.html>.
13. "Congress: we will create 'aam Gujarat,'" *The Hindu,* 4 December 2012.
14. "Congress manifesto: Free tablet to school students, Sachchar committee implementation," *Desh Gujarat*, Ahmedabad, 4 December 2012.
15. <http://www.firstpost.com/category/gujarat2012/page/17?cat_id=40851>.
16. "At 71.3 per cent, voter turnout breaks Gujarat record," *The Hindustan Times*, 18 December 2012.
17. Gujarat Elections: What would 2014 Lok Sabha results in Gujarat look like?, <http://www.indiavotes.com/blog/tag/narendra-modi/>.
18. <http://articles.economictimes.indiatimes.com/2012-03-11/news/31145315_1_vote-share-assembly-polls-assembly-elections>.
19. "Narendra Modi sworn in as Gujarat Chief Minister for fourth term," <http://indiatoday.intoday.in/story/narendra-modi-sworn-in-as-gujarat-chief-minister-for-fourth-time/1/239471.html>.
20. <http://www.dnaindia.com/india/1753082/report-women-far-behind-in-gujarat-pollkshetra>.
21. "A couple of Muslims in House, but Gujarat doesn't care," *The Hindustan Times*, 22 December 2012.
22. Ibid.
23. <http://www.scribd.com/doc/83820662/27/Annexure-1>.
24. "Huge win for BJP in Gujarat civic polls due to Muslim support: Modi," *The Times of India*, 12 October 2010.
25. COMMENTARY A-A+Who Will Gujarat's Muslims Vote For? <http://tehelka.com/who-will-gujarats-muslims-vote-for/>.
26. "Muslims solidly against Modi: Katju in Pak daily," <http://zeenews.india.com/news/ nation/muslims-solidly-against-modi-katju-in-pak-daily_831431.html>.
27. Narendra Modi on TIME Magazine's Cover <http://www.narendramodi.in/narendra-modi-on-time-magazine%E2%80%99s-cover/>.
28. "Feeling vibrant," *The Economist*, London, 17 January 2013.
29. Ibid.
30. "Narendra Modi a 'king among kings,' says Anil Ambani at Vibrant Gujarat summit," <http://www.ndtv.com/article/india/narendra-modi-a-king-among-kings-says-anil-ambani-at-vibrant-gujarat-summit-316076>.
31. <http://www.mycountrymylife.com/excerpts/phase-4.html>.
32. "Gujarat assembly polls: Scarce Muslim representation in polls, but they must vote," <http://www.dnaindia.com/analysis/1775727/comment-gujarat-assembly-polls-scarce-muslim-representation-in-polls-but-they-must-vote>.
33. "DNA test done on Osama Bin Laden," <http://indiatoday.intoday.in/story/dna-test-done-on-osama-bin-laden-report/1/136920.html>.
34. "Stop dialogue with Pak on Sir Creek, says Narendra Modi, Chidambaram heaps ridicule," *The Financial Express*, Ahmedabad, 12 December 2012.
35. "Pakistan delegation forced out of Gujarat summit," *The Times of India*, 13 January 2013.

36. "If Sardar Patel was alive, Afzal Guru would be hanged very promptly and Pakistan would never have asked for Sir Creek," <http://www.narendramodi.in/if-sardar-patel-was-alive-afzal-guru-would-have-been-hanged-very-promptly-and-pakistan-would-never-have-asked-for-sir-creek/>.
37. "Vibrant Gujarat Summit 2013: Anil Ambani compares Narendra Modi to Gandhi, Sardar Patel," *The Times of India*, 11 January 2013.

CLIMATE CHANGE: A THREAT TO HUMAN SECURITY IN NEPAL

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The word "security" has been too elusive to be defined in precise and concrete terms as it was by the traditionalists. With the end of Cold War, the relative dominance of the military-political security plummeted reflecting the widespread recognition of the sources of security being diverted away from centre stage, i.e. the state. In recent years, the political-military construct of security hovered around the state and its apparatus has been brushed aside to the fringe. What have catapulted centre stage of both policy and strategic thinking are the environmental apocalypse, poverty, economic decline and other social crisis of identity, drug and human trafficking and politics of racism, minority, human rights and feminist indignation and the issues relating to the very survival and dignity of human beings. The growing disenchantment with the inadequacy of the state to meet all these security challenges from diverse sources making a muddle of the realist and neorealist understanding of security gave rise to the "wide" versus "narrow" debate about security. The widening of the base of security threats as outlined above and confinement to the use of force blurs the distinction between the traditional and wide concept of security and endangers the intellectual coherence of security and dilutes its meaning. If sources of security threats have been diversified, to cling to the Westphalian concept of security built around the state and its military apparatus seems not in congruence with the changing nature and plurality of security threats. It is not always the state and its military apparatus that can be an appropriate response to such

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threats, rather, a collective security thinking is required such as in the case of climate change.

The study on environment and security has evolved over the years: from an early primacy on incorporating environmental and its concomitant upshots into the "definition of security" to putting a new premium on how environmental degradation can be a cause or magnifier of violent conflict both intrastate and interstate. An emerging trend within this evolution of concept of non-military security threats has been a move towards greater emphasis on the concept of human security. Human security is not in opposition to the earlier trends of redefining security or accounting for the environmental roots of violent conflict. It is an offshoot of these two trends. In a broader sense, human security, concerned with security of the people in non-military terms, is nothing but an extension of environmental security. The very verbiage used to define the term security in these non-traditional and broader senses is today found not dissimilar to that used to understand and define human security. Climate change and its harmful consequences for human beings have been considered as the greatest threat.

Human security has always been lacking for the people of Nepal. A long autocratic monarchy, absence of political stability, absence of appropriate political vigilance, ethnic violence, inaccessible mountain and forest region that hosts and fosters all illegal activities all play a role in the systematic sedimentation of human insecurity in Nepal. The long, insincere autocratic monarchy causes perpetual poverty that triggers human trafficking, large-scale migration to foreign countries as well as making people fall prey to local mafias and extremists. The civil war aggravated the situation that has already claimed the lives of thousands of lives. Although in recent times the country has seen extraordinary political advances like transformation from monarchy to a secular republic, continued political immaturity and instability point to the fact that human security is still a dream for Nepal. Environmental degradation and climate change have also added fuel to the fire of human insecurity. Being an agriculture-dependent country where 50 per cent of the population is directly associated with agriculture and a country where almost all industries are agro-based, tourism is completely nature-based and human security is highly proportionate to climate modalities.[(1)] Adverse climate change causes poverty due to shortage of food grains, leading to a crash of the economy and tourism industry and ends up aggravating political instability, ethnic conflicts and extremism. For Nepal, it has become a vicious circle: political instability does not allow pursuit of appropriate environmental policies giving rise to climate change via environmental degradation which in turn ignites conflicts and endangers political stability. Therefore a holistic approach to studying Nepal's situation is essential to help secure the lives of its approximately 27 million people.[(2)]

Security scenario in Nepal

The word "security" has been defined in multiple ways. Out of these, the realist and the neorealist version of it, i.e. if the state is secure, then who live in it are secure,[3] has received wide acceptance. According to this version the state is the primary provider of security. National independence and territorial integrity are the most important things for the state and a secure state is believed to be the safeguard of these two. Therefore a threat to the integrity and independence of a state has to be understood as the threats to the security of the people in the state. Barry Buzan (1982) defines threats to states in three senses: to the idea of the state (nationalism); to the physical base of the state (population and resources); and to the institutional expression of the state (political system).[4]

In the case of Nepal, all these three threats have been there right from the very inception of the Kingdom of Nepal. Located right between two large countries – India and China — and being a landlocked state, national security issues have always been a major concern for Nepal.[5] Nepal's geographical position therefore influences its security concerns and foreign policy formulations significantly in view of which king Prithvi Narayan Saha declared Nepal's geo-strategic position as "yam between two boulders."[6] China and India's growing influence in the region aggravates the security situation. In proper cognizance of Nepal's geo-political significance, the then British government tried all possible modalities to transform Nepal into a peaceful buffer state between China and British India. After independence, the Indian government has taken several steps to engage itself in Nepal's political affairs. Soon after the independence, India signed a treaty of peace and friendship in 1950 covering all aspects of related issues.[7] In 1965, Nepal and India concluded an arms assistance agreement under which India undertook the supply of arms, ammunition and equipment for the entire Nepalese army.[8] China has also tried its bit regarding the security issues in Nepal by signing treaties first in 1955 and five years later in April 1960, the Treaty of Peace and Friendship. In view of the fact that it has to deal with these two emerging and influential major powers, Nepal's security is quite significant. Following the principles of equidistance and non-alignment and balance of power, Nepal has managed its external security to quite an extent. But it has been a failure in the case of internal security. The so-called People's War, which has claimed more than 13,000 lives,[9] and its subsequent extremism has become the most challenging security threat to Nepal. Political insufficiency and immaturity have worsened the situation. Although Nepal has progressed magnificently in recent years with regard to political advancement, it still has a long way to go in order to stabilize the internal security situation.

"In the past two decades, the security perception of Nepal has shown some significant deviation from typical traditional military-based threats to more diverse threats emanating from a range of non-traditional, non-military components," says Bhattarai (2009, page number missing). After the 1990s, Nepal has witnessed a sea change in political consciousness and awareness.

People have become more vigilant about their rights and issues that are related to their day-to-day lives. Social issues such as the availability of water, healthcare, agricultural matters, tourism, industrial modalities, which are often the crux of intra- and inter-group conflict, have become matters of central concern to the public. Most of these conflicts directly or indirectly are either ignited or aggravated by environmental causes due to changing climate patterns. In Nepal, there is a vicious circle of human insecurity whereby conflict causes environmental degradation which in turn leads to further conflict. During the Maoist insurgency, tens of thousands of people were displaced from their homes, precipitating an internal refugee crisis, particularly in the Mid- and Far-west hill districts and also in the Mid-Terai region.[10] Due to absence of proper settlement policies, these refugees have negative repercussions on the environment which in turn directly triggers inter-communal conflicts that affect the political stability of the country. This environmental degradation will cause further deterioration in stability and bring in more security threats. Since climate change due to environmental degradation affects every aspect of human security in Nepal a holistic approach is required to check political unrest.

Climate change analysis

Before analyzing the impact of climate change on security issues in Nepal, it is pertinent to have a look at the general climate pattern in Nepal as well as the deviation that has occurred due to environmental degradation. Nepal has a wide variation of climate from subtropical in the south, warm and cool in the hills to cold in the mountains within a distance of less than 200km.[11] Among the four seasons, i.e. summer, monsoon (June-September), post-monsoon (October-November) winter (December-February) and pre-monsoon (March-May), the monsoon season primarily dominates Nepal's climate since 80 per cent of annual precipitation occurs during the summer monsoon.[12] Though precipitation varies considerably from place to place because of the non-uniform rugged terrain, the amount of rainfall generally declines from east to west.[13] Apart from the seasonal determinants of climate pattern of Nepal, the high altitude and glacial presence and its geographical location also shapes the climate pattern.

There is no continuous temperature record available in Nepal up to 1921 though the first temperature documentation dates back to 1802 by Hamilton.[14] The trend in temperature patterns in Kathmandu for the 1921-1994 period is similar as that of 24 degree to 40 degree N of the earth, i.e. a general warming trend until the 1940s, a cooling trend during the 1940s-70s and a rapid warming after the mid-70s.[15]

Studies indicate that the increasing trend of average temperature during that period was primarily due to the rising trend in maximum temperatures and there was no increasing trend in minimum temperatures.[16] Average annual temperatures in the Terai regions in the south increased by about 0.04ºC/yr, whereas those in the middle mountain areas in the north increased by about 0.08ºC/yr. Similarly, the pre-monsoon season (March-May) showed the lowest

warming rate of 0.03ºC/yr, while the post-monsoon season (October-November) showed the highest one of 0.08ºC/yr.[17] A study conducted by OECD (2003) projects a scenario where mean annual temperature would rise by an average of 1.2ºC by 2030; 1.7ºC by 2050 and 3ºC by 2160 compared to pre-2000 baseline. The modest projection in winter precipitation is almost no change in western Nepal and up to 5-10 per cent increase in eastern Nepal. However, for summer months the study shows an increase in precipitation across the country in the range of 15-20 per cent.[18] An Intergovernmental Panel on Climate Change report (2007) projects that there will be a general increase in the intensity of heavy rainfall and events in the future and an overall decrease by up to 15 days in the annual number of rainy days over a large part of South Asia.

Climate change impact on human security in Nepal

Being a country highly dependent on agriculture, agro-business and geographical tourism, human security in Nepal is highly vulnerable owing to climate change. Climate systematically affects agriculture due to extreme weather conditions such as floods and droughts, severely affecting food security in the country. It triggers migration, refugee problems and conflicts relating to control over natural resources. Even industry in Nepal is heavily dependent on agriculture. Changes in climate significantly affect the socio-economic fiber of the nation.

Water

Studies have shown that climate change has very adverse impact on socio-economic and political affairs of a country which in turn give rise to many security problems. Furthermore, developing countries are more vulnerable to climate change than the developed countries (IPCC 2001, 287).[19] Having a humid climate, Nepal is prone to changes in spatial and temporal distribution of temperature and precipitation due to climate change which in turn will increase both the intensity and frequency of extreme weather conditions like droughts and floods.[20]

With more than 6,000 rivers flowing from the Himalayan mountains, Nepal is considered rich in water resources. Most rivers are glacier-fed and are, therefore, directly dependent on climate conditions. Due to their sustained flow these rivers have direct and significant impact on Nepal's hydropower generation as well as irrigation system and water supply. Accelerated melting of glaciers during the last half century has caused creation of many new glacier lakes and expansion of existing ones.[21] More than 13 cases of glacier lake outburst have been reported in Nepal since 1964 that caused substantial damage to livestock, land, environment and infrastructure.[22] Accelerated retreat of glaciers with increased intensity of monsoon precipitation observed in recent years has most probably contributed to increased frequency of such floods.[23]

A study by the International Centre for Integrated Mountain Development (UNEP 2001) shows that Nepal's glaciers have shrunk by 21 per

cent over the past 30 years.[24] Studies reveal that almost 67 per cent of the glaciers in the Himalayas have retreated in the 1990s,[25] snowfall amounts at 10 per cent of total precipitation,[26] about 23 per cent of Nepal's total areas lie above the permanent snowline of 5,000 m.[27] In 2000, about 3.6 per cent of the country's total area was covered by glaciers.[28] Owing to rise in temperature these glaciers have retreated pushing up the number of glacier lakes. As many as 2,323 glaciers are found in Nepal Himalayas which have developed at glacier termini during the process of glacier retreat.[29] All of the observed glaciers in the Himalayas have retreated during recent decades[30] at a higher rate than any other mountain glaciers in the world.[31]

Such types of glacier lakes are very commonly found at altitudes of 4,500-5,500m in many river basins of the Nepal Himalayas. The volume and number of these glaciers are continuously increasing due to warmer weather that helps in steady melting of glaciers upstream. These glacier lakes are supported by natural dams which are prone to other natural modalities and also over pressure generated from the lake itself due to more water pouring in consequently these dams collapse and the lake water with debris burst downstream causing huge devastation. These are known as glacier lake outburst flood (GLOF). There have been 13 reported cases of GLOFs in Nepal since 1964 with substantial losses of human lives, livestock, land and infrastructure.[32] A recent study has revealed that there are 20 lakes identified as potentially dangerous glacier lakes in Nepal with an imminent threat of GLOFs.[33]

Owing to high speed of water release along with high amount of debris swept away from river beds, these GLOFs cause the most disastrous floods downstream. For example, the Dig Tosho GLOF on 4 August 1985 caused an immediate release of about 900,000m3 of debris and water with an estimated peak discharge of 1,600 m3/s that damaged cultivated land, houses, 14 bridges, the nearly completed Namche hydropower plant(worth US $3 million), livestock, four human lives and long stretches of the trail along the Bhote Koshi river and upper Dudh Kosh over a distance of more than 42km.[34] Climate change aggravates such risks by rising temperature in Nepal's Himalayan regions.

Considering the fact that more GLOFs are likely to be approaching, the poorest of the poor are more vulnerable to the devastation caused. The phenomenon ultimately ignites social unrest and security issues both for the rich and poor.

Apart from these severe floods, climate change also gives rise to severe draught conditions in Nepal. Drought is another hydrologic extreme, resulting from a significant water deficit.[35] The 2008-09 winter drought, one of the worst in the country's history, has reduced production by 14 and 17 per cent, leaving two million people at risk cutting across 40 out of 75 districts. Though a prolonged drought may affect virtually all sectors of the economy, agriculture is the most vulnerable one.[36] Drought has very serious human implications as it affects agriculture, the livelihood security of a majority of the population in the developing world.[37] With ever-increasing temperature and changing

precipitation patterns due to climate change, Nepal is going to face many more similar droughts challenging human security.

Tourism

Nature with its entire splendour has made Nepal a unique attraction for tourists. Its spectacular landscapes, majestic mountains, grand glaciers, scenic lakes, rivers and unique flora and fauna, across its diverse ecological gradient conserved by an extensive network of parks and protected areas, have attracted a large number of tourists from across the world. Nepal receives as many as 490,000 foreign air travellers annually apart from inland tourists from India. Tourism, therefore, stands as the most important sectors of Nepal's economy, contributing to 9.1 per cent of its total foreign currency earnings and employing approximately 257,000 people. Though mountaineering, trekking, whitewater rafting and safari tours into the jungles are main tourist attractions, trekking stands as the most popular, with 43 per cent of all international visitors enjoying its thrill through the landscape of Nepalese Himalayas.[38] Nepal is rich in flora and fauna and is home to a variety of endangered species such as the snow leopard, one-horned rhinoceros, royal Bengal tiger, Asian elephant, red panda and some 850 species of birds.[39] Studies reveal that the annual influx of visitors in the Nepalese Himalayas increased from about 6,000 in 1962 to 491,504 in 1999, which highlights the bright prospects of the tourism industry.[40]

Since the Nepalese tourism industry is also very dependent on nature, climate change has serious implications for it. Climate change can adversely affect tourism in the Nepalese Himalayas through glacier retreat, avalanches, landslides and flooding, gradual extinction of many species of flora and fauna, and damage to forest ecosystems through fires and insect infestations.

For instance, in the last three decades, the average air temperature measured at 49 stations across Nepal has risen by 1.8 (1c).[41] This is twice as fast as the average warming (1F, 06c) for the mid-latitudinal Northern Hemisphere (24 to 40 N) over the same period. Increasing temperature also gives rise to the precipitation pattern as glacial behaviours in Himalayan region. Mt Everest, the world's tallest mountain which receives about 20,000 trekkers annually, is now considered to be one of the world's six world heritage sites most vulnerable to climate change. The United Nations University Mountain Hazards Mapping Project predicted that flash floods from moraine-dammed and ice-dammed lakes were the major threat facing the Mt Everest region.[42] Researchers from the United Nations Environment Programme (UNEP) and the International Centre for Integrated Mountain Development (ICIMOD) (2002) identified 3,252 glaciers and 2,323 glacial lakes, of which 44 are filling rapidly, and that might burst in as little as five years. UNEP/ICIMOD also identified 20 lakes formed from melting glaciers, which are potentially dangerous to the communities living along the streams, downstream cities, ecosystem and the tourism industry. Sixteen of these lakes are in the Mt Everest region and in eastern Nepal. Similarly, Chitwan National Park, the first and most popular park due to its rich diversity and covering 932 sq km in the subtropical lowlands of

the inner Terai, is home to the second largest population of one-horned rhinoceros, and other endangered species, such as royal Bengal tigers, Gangetic dolphins, 525 species of birds, 150 different butterflies, 125 different types of fish and 49 species of reptiles. It was declared a World Heritage Site by UNESCO in 1984. Changing climate through increasing temperature and precipitation pattern affects the park adversely and its tourist activities like wildlife viewing, bird watching, canoeing and jungle driving. For example, a natural disaster in 1993 triggered by torrential rains in central Nepal unleashed heavy landslides and caused immense debris flow and major flooding that affected 28,000 people in the mountain areas and 42,000 in the lowlands. About 160 people in the highlands and more than 1,000 people in the lowlands were killed and forests, villages and resorts were submerged. The flood damaged the tourism infrastructure of Sauraha, a gateway to Chitwan National Park, and killed some endangered species of animals and destroyed their habitats.[43] Similarly, approaching extreme weather conditions are likely to affect the tourism industry adversely that will ignite major security concerns in the country.

Forests

The quantity and quality of forest resources have always determined a country's prosperity. Forests not only sustain its economic activities by supporting supply of raw materials and backing agricultural activities, but also by determining climate and weather. The relationship, between forest and climate change is poorly understood. However, at least three linkages are quite obvious. Firstly, forests support irrigation, conserve watersheds, improve the soil condition, provide recreation for tourists through forest-based eco-tourism and national parks and wildlife reserves, provide a habitat for flora and fauna and provide raw materials for the forest-based industries.[44] An agriculture- and tourism-dominated economy like Nepal is very much vulnerable since any change in climate brings in negative impact on forest reserves that devastating the livelihood of local communities. Secondly, maintenance of forest-based ecosystem services that support other economic sectors can strengthen societies' resilience to climate change. Lastly, the relationship between climate change and forests seems to be a vicious circle. In the wake of extreme climate change forests get destroyed, and shrinking or destroyed forest reserves are a significant source of the green house gas (GHG) emissions that in turn drive climate change.[45]

Forests can also become the cause of human conflict. From time immemorial, human beings have fought for forest domination due to their heavy dependence on them while shrinking forests are triggering conflicts across the globe. The situation is similar in Nepal. In 1964, forests covered more than 45 per cent of the total area of Nepal, this being reduced to 29 per cent by 1998. It is reported that the forest area of Terai is being destroyed at the rate of 1.3 per cent per year.[46] Apart from human activities like migration and encroachment, smuggling, illegal hunting, grazing, forest fires and lack of active forest management, poor political commitments and lengthy bureaucratic procedures,

forests are also threatened by climate change. Land use change, soil degradation, desertification, species alteration, forest fires, pest infestations and biodiversity loss are some of the major impacts on forest resources. All these impacts directly trigger conflicts since if there is scarcity of resources, there is competition and, therefore, natural resources could be a continuous source of violent conflict.[47]

Agriculture

Nepal's gross domestic product (GDP) for 2008 was estimated at over $12 million making it the 115th largest economy in the world. Agriculture accounts for about 40 per cent of Nepal's GDP. Services comprise 41 per cent and industry 22 per cent. Agriculture employs 76 per cent of the workforce, services 18 per cent and manufacturing/craft based industry 6 per cent. Agriculture produce, mostly grown in the Terai region bordering India, includes tea, rice, corn, wheat, sugarcane, root crops, besides milk and meat. Industry mainly involves the processing of agricultural produce including Jute, sugarcane, tobacco and grain.[48]

Being a mountainous country, Nepal's agricultural system is primarily dependent on the monsoons and on the glacier-fed rivers in the dry season. While monsoon is shifting its terrain due to climate change, water flows in rivers is decreasing as their supporting glaciers are retreating due to warm weather. GLOFs and unexpected draughts inflict an extra burden on the agriculture sector. Floods during 2002, 2003 and 2004 and draughts in 2008-2009 are examples of such extreme weather conditions that devastated the agricultural system of Nepal. The draught in 2008-09 alone reduced 14.5 per cent and 17.3 per cent of wheat and barley production, respectively, risking the lives of two million people across 40 districts.[49] Studies show that Nepal is experiencing a perpetual increase in temperature extremes, more intense rainfall and greater unpredictability in weather patterns, including drier winters and delayed summer monsoons. Soil erosion, which is the major cause declining agricultural produce in Nepal, is getting aggravated by these extreme weather conditions resulting in lower yields. Crop yields in some districts in mid and far western region, which received less than 50 per cent of average rainfall during the period from November 2008 to February 2009, have dropped by more than half and placed more than two million people at high risk of food insecurity.[50] Lower agricultural produce gives rise to severe food insecurity in the region which in turn causes serious human insecurity concerns. Migration increase due to GLOFs is adding to the problem. All these factors combined together trigger intra-and inter-communal violence which challenges human security in the country.

The most exemplary instance of the fact that food insecurity due to climate change triggers human conflict is the well-known Maoist insurgency in Nepal. Studies reveal that due to extreme weather conditions like flood and droughts large-scale migration occurred. Increasing food insecurity and lesser control over natural resources marginalized the poor people further, pushing

them into the Maoist ranks.[51] This so-called people's war is usually seen as a political rebellion for increased political participation and representation but in reality is a war of the common man for better security of food, water and land.

Health

The poorest segment of Nepal's society are subject to unhygienic living conditions, deprived of sufficient food and clean water and have minimal control over natural resources. Owing to lack of better infrastructure, these poor people are very much prone to fatal diseases like malaria, diarrhoea and other air-waterborne diseases. Apart from this, due to changing weather patterns, diseases like malaria, kalazar and encephalitis are more likely to get rampant in the region risking millions of lives.[52] Moreover, increasing food insecurity, frequent floods and droughts force people to migrate to neighbouring countries like India. These migrants are often forced to work and live under appalling conditions, further exposing them to diseases like HIV/AIDS.[53] They then become the carriers of these diseases and transmit them to others on their return to Nepal.

Climate change and security implications in Nepal

The world is going through an environmental crisis, with climate change due to environmental degradation affecting every walk of life. Examples of some of these environmental challenges are: The World Bank has projected that demand for food will rise by 50 per cent by 2030, and for meat by 85 per cent by the same year;[54] UNESCO projects that total global water use will rise by 32 per cent between 2000 and 2025, while the UNDP notes that global water use has been growing nearly twice as fast as population for over a century, and will continue like that.[55] Food insecurity is aggravated by lesser availability of land and water. The Food and Agricultural Organization (FAO) and the UN Environmental Programme (UNEP) revealed that 16 per cent of the arable land used now is degradable. So more violent conflicts are likely to occur over food crops, livestock, biofuels, drinking water, health matters, conservation, carbon sequestration and the world's expanding cities[56] due to climate change. Nepal will be no exception to the devastation of such environmental catastrophes.

In fact, a country like Nepal heavily dependent on agriculture, nature-based tourism and agribusiness is more vulnerable to climate modalities. As discussed above, its agriculture is at stake, food insecurity is intensifying, tourism industry is at high risk, industry faces an impasse, forests are shrinking, and human health is diminishing. All these factors are ultimately leading to serious violent conflicts in the country.

That climate change and resource scarcity can increase human conflict, has been seriously debated in recent years. UN Secretary-General Ban Ki-moon, for example, said in 2007 that "changes in our environment and the resulting upheavals — from droughts to inundated coastal areas to loss of arable lands — are likely to become a major driver of war and conflict".[57] Similarly, the

institutional and political weaknesses of fragile states are making them more susceptible to conflict risk arising from climate change and resource scarcity. A 2007 report from International Alert, for example, found that 46 countries, home to 2.7 billion people, would experience a "high risk of violent conflict" as a result of climate change interacting with economic, social and political problems, while in a further 56 countries with 1.2 billion inhabitants "the institutions of government will have great difficulty taking the strain of climate change on top of all their other current challenges."(58)

Though some scholars disagree that climate change is the sole cause of human conflict, they cannot reject it to be a "threat multiplier." For example, the United Nations Environment Programme report (2009) recently argued: "the exploitation of natural resources and related environmental stresses can be implicated in all phases of the conflict cycle, from contributing to the outbreak and perpetuation of violence to undermining prospects for peace."(59)

In the context of climate change and human security, Homer-Dixon's view seems widely pertinent. Dixon (1994) distinguishes between three kinds of environmental scarcity that can increase the risk of violent conflict:

1. Environmental change, which refers to "a human-induced decline in the quantity or quality of a renewable resource that occurs faster than it is renewed by natural processes";
2. Population growth, which "reduces a resource's per-capita availability by dividing it among more and more people"; and
3. Unequal resource distributions, which "concentrates resource in the hands of a few people and subjects the rest to greater scarcity", and which often results when "property rights that govern resource distribution ... change as a result of large-scale development projects or new technologies that alter the relative values of resources."(60)

In the case of Nepal, all these three factors are at work. It is experiencing rapid environmental change owing to both external and internal human interventions, such as rapid urbanization and industrialization. Similarly, Nepal's population rate is increasing significantly (1.768 per cent per annum according to a 2011 estimate by the US Central Intelligence Agency (CIA)). A significantly high universal marriage rate, particularly amongst reformed Hindus drives Nepal's annual population growth rate in excess of 2 per cent. The result of this is that the marriage rate has caused the population to double about every 30 years. This severely strains the country's underdeveloped economy and finite natural resources. Deforestation is exceedingly widespread. A large amount of marginal land is cleared for agriculture, trees are felled for firewood and leaves harvested for fodder. Deforestation causes erosion in the hills, in turn causing alluvial buildup down on the Gangetic Plain that interferes with flood control structures. Population in the hills greatly exceeds agricultural productivity. Thus, chronic food deficits drive resettlement into the Inner Terai to the detriment of indigenous Tharu people and eastward into Sikkim and Bhutan, where traditional practices of delayed marriage and diversion of significant population

into monasteries and nunneries have otherwise checked population growth. Seeing the demographic writing on the wall after a population census in 1988, Bhutan expelled some 100,000 ethnic Nepalese who became 'Bhutanese refugees' in camps in southeastern Nepal. Refugees comprise 107,803 people from Bhutan and 20,153 Tibetan people.[61] Most refugees live in seven camps established by the United Nations High Commissioner for Refugees (UNHCR). Presence and activity of Tibetan refugees in Nepal also raise sporadic diplomatic conflicts with the People's Republic of China.[62] Overpopulation also drives export of manpower to India, the Middle East, Europe, Australia and North America in search of employment, the so-called Nepalese Diaspora.[63]

And thirdly, due to political empathy and inefficiency under monarchy, Nepal's resources are unequally distributed. All of these factors bring about serious security concerns in Nepal. No wonder, the famous Maoist insurgency has green roots behind its eruption.[64] And even though the newly secular democratic government, NGOs and donors are trying their bit to pacify the conflict, resource-related conflicts are still on the rise in the country.[65]

Slowly but steadily Nepal is recognizing the importance of climate change in relation to conflict resolution. Policymakers are beginning to understand it. Therefore, Nepal is taking both reactive and proactive measures towards climate change mitigation. As a significant signature step it has made a number of bilateral as well as multilateral commitments to foster sustainable development and environmental protection. The Sagarmatha Declaration is the most notable instance of Nepal's vision that shows its commitment to not only protect Mt. Everest from climate change but also to protect the entire Himalayan region from natural catastrophes through sustainable development and proactive forest management. In its agenda, Nepal aims to get international as well as the relevant state's help to save the Himalayas ecosystem. It commits to be engaged in research and analysis and launches awareness campaigns at the local and national levels on adverse impacts on local livelihood and life-support systems caused by climate change in the Himalayan region and other related areas especially on the poor, marginalized groups, ethnic and indigenous people, Dalits, women and children. It also commits to develop early warning system response to natural hazards as well as adopting alternative resilience system in agriculture so as to mitigate the adverse effects of climate change. In its vision, Nepal through the declaration commits to expand its protected area from the existing 20 per cent to 25 per cent and also to increase the forest area up to 40 per cent of the total land mass.[66]

All these proactive commitments are, however, getting setbacks owing to lack of funding as well as appropriate political commitment. Nepal, in its climate programme, seeks International funding to implement its National Adaptation Plan and also calls for to reframing the provisions of the Clean Development Mechanisms (CDM) so that all poor and least developed countries are able to benefit fully from such mechanisms.[67] But it has a long way to go. Genuine political commitment with proactive local participation along with extensive research is still required to secure Nepal from the ravages of climate change.

Conclusion

Security paradigms are very enigmatic in Nepal. Due to its unique geographical location, the traditional paradigm of state-centric security based on military means is gradually fading away. The theory of balance of power between the two major powers, i.e. India and China, is becoming relevant to the buffer state Nepal. At the same time, however, its internal political turmoil creates many security concerns. A long, oppressive monarchy and a violent Marxist insurgency triggered by scarcity of resources owing to environmental degradation has violated all human security parameters. Even though the country has made amazing progress over the past decade in terms of transformation of power from monarchy to secular democracy, political immaturity and insufficiency have kept the security issues alive. Climate change due to environmental degradation has aggravated the problems. Rapid and unexpected climate change has adversely affected the country's economy covering agriculture, industry, and tourism, and has triggered new human conflicts due to migration, food insecurity, loss of drinking water and unemployment. It has led to loss of lives by increasing the spread of many fatal diseases in the country. Though people have already adopted many countermeasures to mitigate the impact of climate change, like farming vegetables instead of rice, community forestry, etc. a major systematic governmental intervention is required to address the climates concerns which are the major cause of human insecurity in the region.

Notes and References

1. Andrea Matles Savada, "Nepal: A Country Study: Agriculture", 1991, Washington GPO for the Library of Congress. <http://countrystudies.us/nepal/41.htm>, accessed 2 July 2012.
2. Government of Nepal, *Preliminary Census Report*, 2011, <http://census.gov.np/images/pdf/Population%20Census%20Prelliminary%20Report%202011.pdf>, accessed on 22 June 2012.
3. Kanti Bajpai "Beyond Comprehensive Security: Human Security," *Comprehensive Security: Perspectives from India's Regions*, New Delhi: Delhi Policy Group.
4. Barry Buzan, *People, State and Fear The National Security Problem in International Relations*, Sussex: Wheatsheaf Book Ltd.
5. Rajan Bhattarai and Rosy Cave (eds), *The Concept of Human Security and Changing Security Dynamics in Nepal,* Kathmandu Nepal: Nepal Institute for Policy Studies (NIPS).
6. Sangeeta Thapliyal, "Contesting Mutual Security: India-Nepal Relations," 2003, <http://orfonline.org/cms/sites/orfonline/modules/analysis/AnalysisDetail.html?cmaid=2223&mmacmaid=168>, accessed on 22 June 2012.
7. Nihar Nayak, "India-Nepal Peace and Friendship Treaty(1950) — Does it require revision?," *Strategic Analysis*, 34:4, July 2010, Institute of Defence Stadies and Analysis (IDSA), New Delhi.
8. Sangeeta, op.cit., (ref.6), accessed on 22 June 2012.
9. Bhattarai and Cave, op.cit., (ref.5).
10. Ibid.

11. "Nepal: State of the Environment 2001," United Nations Environment Programme (UNEP), and International Centre for Integrated Mountain Development, (ICIMD), Kathmandu, Nepal, 2001.
12. K.S. Yogacharya, "Meteorological aspects," *A Compendium of Environmental Statistics, 1998*, Central Bureau of Statistics, Kathmandu, Nepal.
13. K. Shankar, and P.B. Shrestha, "Climate," in Nepal — Nature's Paradise: Insight into diverse facets of topography, flora and ecology, T.C. Maju puria, (ed.), Bangkok: White Lotus Co. Ltd, 1985.
14. Quoted in Chaulagain Narayan Prasad, "Impacts of Climate Change on Water Resources of Nepal: The Physical and Socioeconomic Dimensions", a dissertation, Flensburg, 2006.
15. A.B. Shrestha, (2001), "Tsho Rolpa Glacier Lake: Is it linked to Climate Change?" in *Global Change in Himalayan Mountains, Proceedings of a scoping workshop*, held in Kathmandu Nepal, on 2-5 October 2001 [K.L. Shrestha, (ed)], pp.85-95.
16. K.P. Sharma, et.al., "Anthropogenic, Climatic and Hydrologic Trends in the Koshi Basin, Himalaya," in *Climatic Change*, The Netherlands: Kluwer Academic Publishers, 2000.
17. Shrestha, op.cit., (ref.15), pp.85-95.
18. OECD Study-General Circulation Model (GCM) run with the SRES B2
19. "Climate Change 2001: Synthesis Report," Contribution of Working Groups I, II and III to the Third Assessment Report of the Intergovernmental Panel on Climate Change, (IPCC), Watson, R.T. and the Core Writing Team (eds.), Cambridge: Cambridge University Press, 2001.
20. F.U. Mahtab, (1992), "The delta regions and global warming: impact and response strategies for Bangladesh", in *The Regions and global warming: Impacts and response strategies*, J. Schmandt, J. and J. Clarkson (eds.), (New York: Oxford University Press, 1992).
21. P.K. Mool, et.al., Inventory of Glaciers, Glacial Lakes and Glacial Lake Outburst Floods Monitoring and Early Warning Systems in the Hindu Kush-Himalayan Region, (Kathmandu: ICIMOD.)
22. B. Rana, et.al., "Hazard assessment of the Tsho Rolpa Glacier Lake and ongoing remediation measures," *Journal of Nepal Geological Society*, Vol.22, 2000, pp.563-570.
23. S. Agrawala, et.al., *Development and climate change in Nepal: Focus on water resources and hydropower*, Paris: Organization for Economic Cooperation and Development, 2003.
24. Dev Raj Dahal, "Nepal: Climate Change and Security, demands holistic approach", speech made at a *Telegraph Weekly,* <telegraphnepal.com/Friedrich Ebert Stiftung>, FES national seminar on Climate Change, held on 23 December 2011.
25. "Climate Change 2001: Impacts, Adaptation, and Vulnerability," contribution of WG II to TAR of the Intergovernmental Panel on Climate Change (IPCC), McCarthy, M.C., O.F. Canziani, N.A. Leary, D.J. Dokken and K.S. White (eds.), Cambridge, 2001.
26. "Nepal: State of the Environment 2001," op.cit., ref.11.
27. Initial National Communication to the Conference of Parties of the United Nations Framework convention on Climate Change, Ministry of Population and Environment (MPOE), Kathmandu, Nepal, 2004, pp.153
28. P.K. Mool, et.al., Glacial Lakes and Glacial Lake Outburst Flood Events in the Hindu Kush-Himalayan Region. in *Global Change and Himalayan Mountains*, K.L. Shrestha, (ed.), Institute for Development and Innovation, Lalitpur: Nepal, pp.75-83
29. Mool, et.al., op.cit., (ref.21).
30. Y. Ageta, et.al., "Study project on the recent rapid shrinkage of summer-accumulation type glaciers in the Himalayas, 1997-1999," in *Bulletin of Glaciological Research*, 18, Japanese Society of Snow and ice, pp.45-49.

31. M. Nakawo, et.al., (1997), "Basic studies for assessing the impacts of the global warming on the Himalayan cryosphere, 1994-1996," in *Bulletin of Glacier Research,* 15, Data Centre for Glacier Research, Japanses Society for Snow and Ice, pp.53-58.
32. B. Rana, et.al., op.cit., Re.22, pp.563-570.
33. Mool, et.al., op.cit., (ref.28), pp.75-83.
34. D. Vuichard, and M. Zimmermann "The 1985 catastrophic drainage of a morane-dammed lake Khumbu Himal, Nepal: Cause and consequences," *Mountain Research and Development*, Vol.7, No.2, pp.91-110.
35. "Guide to Hydrological Practices: Data acquisition and processing, analysis, forecasting and other applications," (Geneva: WMO-No. 168, World Meteorological Organization, 1994, pp.735).
36. K.D. Frederick, and P.H. Gleick, Water and Global Climate Change: Potential Impacts on U.S. Water Resources, prepared for the Pew Center on Global Climate Change, 1999, pp.8.
37. M.S. Swaminathan, "Climate change, food security and sustainable agriculture: Impacts and adaptation strategies", in *Climate change and India: Issues, concerns and opportunities*, P.R. Shukla, S.K. Sharma and P. Venkata Raman (eds.), (New DelhI: Tata McGraw-Hill Publishing Company Ltd, 2002, pp.196-216.
38. "Annual Statistical Report, 2004" (Kathmandu: Ministry of Culture, Tourism and Civil Aviation) (CTCA).
39. Gyan P. Nyaupane and Netra Chhetri, "Vulnerability to Climate Change of Nature-Based Tourism in the Nepalese Himalayas," *Tourism Geographies*, Vol.11, No.1, 95–119, February 2009.
40. MCTCA Report, op.cit., (ref.38).
41. A.B. Shrestha, et.al., "Maximum temperature trends in the Himalaya and its vicinity and relationship with some large-scale climatological parameters," *Journal of Climatology, 20(3)*, 1999, pp.317-327.
42. J.D. Ives and B. Messerli, The Himalayan Dilemma: Reconciling Development and Conservation, New York: Routledge, 1989.
43. Nyaupane and Chhetri, op.cit., (ref.39).
44. b.r. Upreti, "Relationship between Resource Governance and Resource conflict: Nepalese Experiences," *Journal of Legal Pluralism*, 2004.
45. Gupta Shankar Prasad, Climate Change, Forest Resource and Risk of Violent Conflict in Nepal: Understanding the Linkage, a paper, HNRSC, Kathmandu University, 2011.
46. Ninth Plan, 1997-2002, (National Planning Commission, 1998).
47. Prasad OP.CIT., (REF.45).
48. "Economy of Nepal," <http://www.asianinfo.org/asianinfo/nepal/Economy%20of%20Nepal.htm>, accessed 26 June 2012.
49. Ajaya Dixit, "Climate change in Nepal: impacts and adaptive strategies", <http://www.worldresourcesreport.org/responses/climate-change-nepal-impacts-and-adaptive-strategies#linkback2>, accessed on 18 June 2012.
50. "Food security," <www.wfp.org/food-security>.
51. Jugal Bhurtel and and Saleem H.Ali, "The Green Roots of Red Rebellion: Environmental Degradation and the Rise of the Maoist Movement in Nepal", an occasion paper, <http://www.swisspeace.ch/fileadmin/user_upload/Media/Countries/Nepal/Bhurtel_Jugal_Green_Roots_of_Red_Rebellion.pdf>.
52. UNDP Report, (United Nations Development Programme), 2008.
53. Bhattarai and Cave, op.cit., (ref.5).
54. *World Development Report* (2008), (Washington: World Bank).
55. *Human Development Report 2006: Beyond Scarcity — Power, poverty and the global water crisis*, New York: UNDP, 2006).
56. *World Development Report 2008*. Washington: World Bank Report, op.cit., (ref.54).

57. Ban Ki-moon, address to the United Nations International School — UN Conference on "Global Warming: Confronting the Crisis, <http://www.un.org/apps/news/infocus/sgspeeches/search_full.asp?statID=70>.
58. D. Smith, and Vivekananda, (2007), A Climate of Conflict: The links between climate change, peace and war, London: International Alert.
59. "From Conflict to Peacebuilding: the Role of Natural Resources and the Environment," (Geneva: UNEP, 2009). <http://www.unep.org/publications/search/pub_details_s.asp?ID=3998>.
60. T. Homer-Dixon, *Environmental Scarcities and Violent Conflict: Evidence from Cases*, Toronto: University of Toronto 1994).
61. "Demographic profile of Nepal," <http://en.wikipedia.org/wiki/Demographics_of_Nepal#cite_ref-0>, accessed 28 June 2012.
62. CIA (2011), <https://www.cia.gov/library/publications/the-world-factbook/geos/np.html>, accessed 26 June 2012.
63. "Demographic profile of Nepal," op.cit., (ref.61).
64. Bhurtel and Ali, op.cit., (ref.51)
65. Upreti op.cit., (ref.44).
66. 5th International Sagarmatha (Mt. Everest) Day, 29 May 2012, <http://welcomenepal.com/newsletterassets/2012/may25/5th-Int'l-Sagarmatha.pdf>, accessed on 2 July 2012.
67. Ibid.

SOCIAL ATTITUDES TO WOMEN'S EMPLOYMENT IN BANGLADESH

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Human behaviour is the manifestation of attitude and values. The purpose of the present study is to investigate the relationship of women's work status with attitude towards female employment, female role perception and perceived social support as attitudinal variables. Women's work status may be categorized according to their involvement in income earning activities. Women who are involved in "income earning activity" or recognized as "earning member" of the family are called working women. On the other hand, women who are not involved in "income earning activity" are known as nonworking women.

According to the traditional feminine sex role of home-making, "a woman's place is at home." But in modern society, with increasing industrialization and literacy rate of women, women have turned to gainful employment outside the household for wages and this traditional view towards women's sex role has been changed.(1) In recent decades, both in fully industrialized and developing countries, the proportion of women in paid employment has increased substantially.(2) The world economy is now globalised. Bangladeshi women are not far away from the linkage of global economy. As a developing country, percentage of women among total employed people was 10.2 in 1985 and it increased further in the last decade.(3) The total civilian labour force of the country has been estimated at 49.5 million (Labour Force Survey, 2005-06) of which 37.3 million are male and 12.1 million are female while it was 46.3 million for both sex, 36.0 million for male and 10.3

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million for female in 2002-03.[4] This statistics shows that the increasing rate of employed women is higher than its counterpart.

Determining factors of women's participation in employment can be divided into four categories, namely: (i) psychological factors, (ii) socio-economic and demographic factors, (iii) religious and cultural factors, and (iv) legal and political factors.[5] Some studies have focused on psychological factors (variables) influencing women's participation in employment. Empirical literature suggests, attitudinal variables influence women's decision making for participating in paid employment, such as a husband's and wife's attitude towards female employment,[6] sex role attitude[7] and perceived social support.[8]

Attitude Towards Female Employment (ATFE): Attitude towards female employment is a positive or negative evaluation of female's participation in employment. Women with favourable ATFE are liberal in female role perception, active in decision making, and have more independence training, whilst women with unfavourable attitudes are housewives and have more children.[9] More employed married women than non-employed married women significantly expressed positive attitude toward female employment.[10] Ilyas found, working women have higher mean ATFE score than nonworking women. That means, attitude towards female employment may be a crucial factor that influences women's decision to participate in employment.[11]

Female Role Perception: Female role perception is the attitudes, beliefs, and behaviour patterns that define what is traditionally masculine or feminine within a culture.[12] It is also defined as "sex role attitude" and "sex role perception". The manner of men and women's behaviour in a society depends considerably on how they perceive their sex roles. "Sex-role" refers to the expectation of the society as regards what role a female or a male should play. Traditionally in our society, attitudes related to "feminine role" involve positive feelings of being lovable, getting married, being an obedient housewife, rearing children, being a lovable mother and submissively doing all household work, etc. Working mothers have a more liberal sex role attitude than nonworking mothers.[13] Masculine women (those who attribute more traditionally considered masculine than feminine characteristics to themselves) generally tend to choose traditionally considered masculine careers more often, while feminine women (those who attribute more traditionally considered feminine than masculine characteristics to themselves) tend to choose feminine careers more often.[14] The research evidence also showed the positive association between egalitarian sex-role attitudes and greater participation in the labour force.[15] Thornton, Alwin and Camburn found that the direction of influencing relationship between female labour force participation and sex-role attitude is interchangeable. Women who perceived female role as being primarily centred in the home are less likely to become involved in paid employment, while non-home work tends to change traditional orientations.[16]

Women with enjoyable and extensive professional work experience reported "extensive or severe crisis" and "emotional difficulties" in adjusting to their first child due to their poor identification with "the feminine role" (e.g.

motherhood).[17] Some mothers, for rearing the child properly, choose to drop out of the workforce temporarily or permanently.[18] Whereas, few new mothers choose to work part-time in their professional occupations.[19] One of the causes of dropping out from the workforce may be the strongest identification with the traditional feminine role. In contrast, Jimenez found employed women have more positive motherhood experience and better adjustment ability.[20]

Perceived Social Support: Perceived social support means all those form of supports provided by other individuals and groups that help an individual to cope with life.[21] Social support is an important factor in assisting individuals and families to make transitions, cope with life stresses, and promote health.[22] It includes supportive workplace relationships, spousal support, and satisfactory child care arrangements. Social supports at work, within the family and through child care have been identified as major facilitators of maternal employment.[23] Social support facilitates successful postpartum return to employment.[24] According to the transactional model of stress,[25] perceived social support may be viewed as a coping resource that has the mitigating or appraisal effects on the role conflict (i.e. conflict between "mother" and "worker" roles) [26]and the stressful situation.[27] Research on employed women suggests that common symptoms (e. g., fatigue) are responsive to stress associated with multiple responsibilities at home and work.[28] Weber and Cook reported that the working women suffer from more stress than male colleagues.[29]

Interference between work and family responsibilities has been associated with lower health ratings and increased symptoms in postpartum women.[30] In such a situation, social support provides real help to meet demands and facilitates coping with the effects of stress.[31] The perceived social support was related to mastery beliefs and self-esteem, which were in turn associated with more positive mental health, less depression and anxiety.[32] More meaningful indicators could be that the woman remains employed; that she is able to function in her multiple roles of wife, mother, and worker; and that she adequately balances her work and family responsibilities. These outcomes could be influenced by the availability of social support in her workplace from supervisors and co-workers, the support she receives from her spouse in sharing family responsibilities and in indicating a positive attitude towards her employment and the availability of acceptable child care.

In Bangladesh, as a Muslim developing country, the role of motherhood and family responsibility are considered important for women's personal careers.[33] This message is conveyed by the different institutions of socialization. Many Bangladeshi girls, even being educated, are still trained by their family members to be submissive, patient and to make sacrifices, in order to accept marriage as the main goal in life. Under inherited gender norms, married working women feel guilty thinking their labour force participation as a reason for neglecting children and home responsibilities. There is no doubt, women involved in multiple roles fail to fulfil proper multiple roles and responsibilities expected in society. Successively different role playing often brings a conflict between what they expect and experience. It has been found

that role overload can result in stress and conflict.[34] Role conflict links with many consequences, such as: substandard performance, low rate in job involvement, job dissatisfaction.[35] Majority of working women assume that spouses sharing their housework would result in less conflict. But in reality they experienced maximum maladjustment.[36] Most of Bangladeshi males view domestic works exclusively as the domain of women. They are not aware of the growing changes in society and its consequences on women's life. With the industrialization and high rate of population growth, most people face difficulty meeting the basic needs with the income of a single earning member. This reality may demand women to get involved in earning activities. Moreover, in this male dominated society, women belonging to a lower social strata and vulnerable economic conditions may become an easy target to various forms of violence such as mental and physical torture for demanding dowry. As the economic self-dependency or economic strength is considered as the basis of social, political and psychological power in society,[37] women with a low economic status would be benefited both socially and psychologically from economic strength. Therefore, it is necessary to identify the factors facilitating women's participation in employment and their empowerment.

The above literature review suggests that attitudinal variables, as psychological factors, may play an important part in determining women's decision to participate in paid employment. Some of these factors inhibit women from working outside their homes, while others function to expand women's ability to work. Impact of these factors also may vary across cultures. The current study attempted to identify attitudinal factors (e. g. attitude towards female employment, female role perception and perceived social support) facilitating women's participation in paid employment in Bangladesh. The knowledge of the research may help to reduce obstacles of women's participation in employment by suggesting special vocational programmes, changing in socialization and developing awareness in people about women's overall well-being.

In light of the above objectives, the following hypotheses were formulated:

Favourable attitude towards female employment, liberal female role perception, and more social support increases women's participation in paid employment.

Method

Participants

A total of 300 purposively selected women participants were from Dhaka city. Distribution of women according to work status was as follows: working full-time-100, working part-time- 90, non-working- 110. Women who are working 30 hours (excluding meal break and overtime) or more in a week are treated as full-time and those who are working less than 20 hours in a week are treated as part-time. The working women respondents had experience in different professional services (teacher, lawyer, doctor, researcher, administrative officer, banker, social worker, business, clerk & labour). The

respondents' education varied between fifth grade to Ph.D. with ages ranging between 17 to 55 years whereas monthly family income ranged between 3,000 to 100,000 taka. The marital status of participants was married, unmarried, divorced or widowed.

Instruments

The following instruments were used in this present study:

1. *The Attitude Towards Female Employment (ATFE) Scale* [38]: The ATFE scale is a 12-item Likert type scale in Bangla. Items of the scale cover questions related to paid employment of women. It includes items related to opportunities and difficulties of female employment. Some items are concerned with equality between sexes in appointment, choice, and promotion at work. Other items are related to the conflict experienced by employed mothers in coping with both domestic and paid employment.

   Each item has favourable-unfavourable response dimension and has three response alternatives ordered according to their degree of favourableness regarding attitude towards female employment. For each item score 2 indicates favourable work attitude, score 1 moderately favourable work attitude and score zero indicate unfavourable work attitude. A subject's total score in the scale is the sum of the numerical values of responses to all items of the scale. The possible range of scores (rs) for full scale is from 0 to 24 where 0 expresses most unfavourable and 24 most favourable work attitude. Items of ATFE scale have face validity and high Discriminative Power (DP) [range from 0.06 to 1.17]. Corrected item-to-total correlation coefficient ($\underline{r}s$) and alpha coefficient suggest high scale reliability. The $\underline{r}s$ range from 0.323 to 0.522 and each of these rs is significant at $p<0.005$ level. The alpha coefficient (α) is 0.7581. Significant F-ratio of ATFE score by work status [$F(1, 945) = 87.395$, $p<0.005$)] indicates the validity of the scale.

2. *The Female Role Perception (FRP) Scale* [39]*:* The FRP scale contains 21 items. Each of the first 20 items of the scale includes statements dealing with adult female role situations particularly related to family, occupation, and social life. The items are all short statements expressing either traditional or non-traditional role performance with three response alternatives: "yes", "uncertain" and "no". Traditional preference suggests that a woman's family responsibilities are more important than her personal career; her primary purpose is to be responsible for household and child care tasks, subordinating her own interests for well-being of husband and family. Nontraditional preferences, on the other hand, stress equality between sexes, and consider a woman's satisfaction and achievement equally important to those of her husband and family. Among these 20 items, 8 items are phrased in traditional way and 12 in nontraditional way. The last item contains two paragraphs. Paragraph A states that women should focus

attention on home and family affairs, while paragraph B states that women should be equal to men in opportunities, pay and type of occupation chosen. Subjects are asked to respond to his item by selecting one of the five possible answers indicating their degree of agreement with the two paragraphs. The scale was reliable and valid. Item-to-total correlation coefficient (rs) was calculated for determining the reliability of the scale. The rs ranged from 0.1979 to 0.5337 ($p < 0.0001$for each rs). Significant point biserial correlation coefficients (rpbi) of the total scale with place of residence [rpbi (1478) = 0.301, $p< 0.01$], and work experience [rpbi (1478) = 0.412, $p<0.01$] indicated the validity of the scale.

3. *The Bangla version [40] of Provision of Social Relations (PSR) Scale:* The Bangla version of the provision of social relations (PSR) questionnaire has been used to measure social support of participants. The original scale was developed by Turner, Frankel, and Levin.[41] The PSR containing 15-items is based initially on the conceptualization of five components of social support (attachment, social integration, reassurance of worth, reliable alliance and audience). Factor analysis revealed the PSR to have essentially two dimensions, family support (items 4, 7, 10, 11, 12, 14) and friend support (items 1, 2, 3, 5, 6, 8, 13, 15). The PSR has few instruments that examines environmental variable of social support. Here, PSR is scored by reverse scoring items 7 and 15 then summing the items scores on each of the sub dimensions to get a score for that dimensions.

In addition to these questionnaires, a Personal Information Form (PIF) was used to collect information about sexual orientation, age, educational qualification, marital status, duration of marital life, profession (including designation), types of job, duration of working hour, monthly income (participant's & her family excluding her), husband's profession and educational qualification, number of child and age of first born.

Procedure

To collect data, the questionnaires mentioned above were administered individually by the interviewers to the participants selected in the sample. Each participant was given separate instructions for each questionnaire and was allowed to ask freely if she has question regarding any item of the scale. Respondents who were spontaneous and showed positive attitudes towards the research, were administered the questionnaires. At first, each respondent was briefed about the purpose of the study and was requested for cooperation with the researcher. The interviewer gave assurance to the participants of dealing their information confidentially.

Results

The obtained scores were analyzed by one way *ANOVA* (shown in Table 3, 4 & 5). The *descriptive statistics* (mean scores and standard deviation) given in Table 1 were also calculated. The multiple comparison of mean scores

on attitude towards female employment, female role perception, and perceived social support in terms of work status by using *Post Hoc* test is presented in Table 2.

Table 1

Mean and Standard Deviation of Work Status Groups [Working Full-time (n=100), Working Part-time (n=90) & Non-working (n=110)] in terms of Attitudinal Variables

Attitudinal Variables	Work Status					
	Working Full-time		Working Part-time		Non-Working	
	$\bar{X}$	*SD*	$\bar{X}$	*SD*	$\bar{X}$	*SD*
Attitude towards Female Employment	19.00	2.86	17.10	3.43	16.10	3.20
Female Role Perception	31.80	5.83	26.10	5.66	26.94	5.57
Perceived Social Support	32.65	5.88	33.44	7.51	34.63	5.66

Table 2

Mean Score Differences among Work Status Groups according to Attitudinal Variables by using Post Hoc test

Personality & Attitudinal Variables	Work Status	Work Status		
		Working Full-time (1)	Working Part-time (2)	Non-Working (3)
Attitude towards Female Employment	(2)	1.90000**	-	-
	(3)	2.90000**	1.00000*	-
Female Role Perception	(2)	5.70000**	-	-
	(3)	4.86364**	.83636	-
Perceived Social Support	(2)	.79444	-	-
	(3)	1.97727*	1.18283	-

*p< .05; ** p< .001

Table 3

Analysis of Variance (ANOVA) for Attitude towards Female Employment by Work Status

SV	*SS*	*df*	*MS*	*F*
Work Status	449.667	2	224.833	22.423*
Error	2978.000	297	10.027	

**p*<.001

Table 3 shows that attitude towards female employment significantly varies [F = 22.423; df = 2, 297; p< .001] in terms of work status. In multiple mean comparisons shown in Table 1 & 2, the difference (1.90000) between mean scores for working full-time (X = 19.00) and working part-time (X = 17.10) group according to attitude towards female employment is significant at .001 level. The mean difference (2.90000) between working full-time (X = 19.00) & non-working (X = 16.10) and that (1.00000) between working part-time (X = 17.10) & non-working (X = 16.10) are also significant at .001 and .05 level respectively. The working full-time group shows more favourable attitude towards female employment than other two work status group. Then the working part-time group reveals more favourable attitude towards female employment than the non-working group.

Table 4

Analysis of Variance (ANOVA) for Female Role Perception by Work Status

SV	SS	df	MS	F
Work Status	1865.132	2	932.566	28.837*
Error	9604.655	297	32.339	

*p<.001

Table 4 shows, the female role perception (FRP) differs [F = 28.837; df = 2, 297; p< .001] significantly as a function of work status. The mean differences (5.70000 & 4.86364 respectively) of the working full-time group (X = 31.80) with the working part-time group (X = 26.10) and the non-working group (X = 26.94) are significant at .001 level [shown in Table 1 & 2]. Table 1 & 2 also shows that there is no significant mean difference (.83636) between the working part-time group (X = 26.10) and the non-working group (X = 26.94) at .05 level. So, the working full-time group has more liberal female role perception than the working part-time group and the non-working group.

Table 5

Analysis of Variance (ANOVA) for Perceived Social Support by Work Status

SV	SS	df	MS	F
Working Status	208.456	2	104.228	2.596*
Error	11926.690	297	40.157	

*p>.05

The ANOVA of perceived social support shown in table 5 indicates that there is no significant difference [F = 28.837; df = 2, 297; p > .05] among the work status groups. But the multiple mean comparison reveals, the mean difference (1.97727) between the working full-time (X = 32.65) and the non-working group (X = 34.63) is significant at .05 level [according to Table 1 & 2]. The mean scores of perceived social support for three work status groups shown in table 1 indicates the non-working group (X = 34.63) has the highest need for social support and the working full-time group (X = 32.65) has the lowest need for social support.

Discussion

The formulated hypotheses (women who have more favourable attitude towards female employment, liberal female role perception, and more social support increases women's participation in paid employment) were partially supported by the results. The relation to women's participation in employment with attitudinal factors under the study may be reciprocal.

Attitude towards female employment in the study differed significantly among three working status groups. Working full-time group showed more favourable attitude towards female employment than the other two groups. Then working part-time group had a greater mean score in female work attitude than the non-working group. This finding is consistent with previous studies conducted by Katelman & Barnett[42] and Ilyas.[43] In explaining the findings, it can be said that women with more favourable attitude towards female employment view the world as a work arena. Moreover, they accept employment as a basis and a source of self-respect, sense of worth, gaining prestige, enjoyment and gaining financial benefit. Such feelings may inspire them to engage in different occupations. On the other hand, non-working women may feel working outside would complicate their lives further. It would overload their responsibilities and create obstacles to a happy marital life or their children's well-being. These may be the reasons of showing unfavourable attitude towards females working outside hence avoiding employment. A reverse relationship may exist between female work attitude and employment. Experience of enjoyment, prestige and economic independence for participating in employment may make female work attitude more favourable.

Another finding revealed that the working full-time group has significantly more liberal female role perception than the working part-time group and the non-working group. The working part-time and the non-working groups did not differ significantly in terms of sex role perception. The result was supported by previous researches conducted by Pistrang[44], Whitley[45], Thorton and Freedman[46]. This finding may be explained by the theory of cognitive dissonance which suggests, in spite of having young children, women's participation in employment may increase,[47] because it is difficult for them to believe that this activity is harmful to their marriage or to their children's well-being. Moreover, with increasing educational levels and the negative exposure of traditional sex roles, working women may undermine the beliefs rationalizing the traditional sex division of labour. These are the factors which may impact women work participation. Their beliefs were reflected in the previous findings obtained by Jimenez, who found, working women had a more positive motherhood experience and better adjustment ability.[48]

Direction of the relationship between work status and female role perception may be interchangeable as shown in the study of Thornton, Alwin, and Camburn.[49] Employed women enjoy economic independence, they have a broader social horizon i.e. colleagues and friends with whom they can talk and release tension, if any. They are viewed as an important figure by the family members for contributing in family expenditure. They also participate in family decision making. This background may make them more positive in egalitarian sex role. On the other hand, working women may show unfavourable attitude towards liberal sex role if they faced with problems, such as, lack of proper care for children and proper management of home, unequal status in the office etc. These circumstances make it difficult to live a harmonious life by managing both work and family responsibilities. Consequently, they may quit their job permanently/temporarily or prefer part-time work in order to reduce their work

hours. For example, many researchers [e.g Schwartz[50], Meiksins and Whalley[51]] found such evidence in their studies.

In case of social support, results showed that the only difference between the two groups (working full-time & non-working group) was significant. This finding was consistent with other studies conducted by Killien, Habermann and Jarrett[52]; Killien[53]. Women with a high score in social support seem to experience more positive (desirable) events in their lives, have higher self-esteem, internal locus of control and take a more optimistic view towards life as opposed to women with lower social support. They also rate themselves as socially more skilled persons.[54] These characteristics may help them to persist in doing a task that does not yield a ready solution and inspire them to perform multiple activities (homemaker & worker roles) properly. In light of the research findings [e. g. research conducted by Lazarus, DeLongis, Folkamn and Gruen[55]; Barnett, Marshall and Singer[56]], it can be said that multiple role playing may be a source of role conflict which in turn creates fatigue, stress, depression and physical illness. But working women's perceived sufficient social support can mitigate the role conflict and its derivatives. As a result they can continue their earning work activities. Referring to the findings of the study by Gjerdingen and Chaloner;[57] it can be concluded that women perceiving more social support have higher self-esteem, which in turn enhances mental health conditions, decreases depression and anxiety levels. Such conditions are facilitative of women's work participation. On the other hand, women with inadequate perceived social support have low self-esteem and face difficulty to play multiple roles. Due to lack of social support, they cannot ensure their children's well-being or effective marital adjustment. This situation may keep them away from work participation.

In contrast, work experience may also increase social support of working women. Employed women have broader social network, for instance, colleagues and friends with whom they can share any problems and get directions to overcome their difficulties or release stress by talking. Homemakers, on the other hand, have to stay at home to perform household activities resulting in a lack of economic independence and little recreational facilities in this society, apart from the possibilities of their husbands being more dominating. Due to economic vulnerability, they may often become victim to different forms of domestic violence. This background may be the reason for difference in perceived social support among working and non-working women.

The research results also revealed that the working part-time group did not significantly differ from the non-working group in terms of female role perception and perceived social support. The reason of having no significant difference may be that social position, economic insufficiency, scope of social support, familial environment are similar amongst them.

But the relationship between women's work participation with attitude towards female employment, female role perception and perceived social support may not be straight forward. The literature review suggests that this relationship may be mediated by other factors, such as, education, difficulties of

pregnancy, number of children, availability of daycare, husband's income, profession & attitude, type of job, economic development of the country, the demand for female workers, job security, ill-health, family problems, non-availability of suitable jobs, lack of adequate tolerance and respect in the work place, housing and transportation problems, inadequate pay, mother's profession and education etc. Considering these factors, an interdisciplinary approach may help us understand women's participation in employment better.

However, this study cautions generalization because of having some limitations. The sample did not represent the whole country as it was only limited to the Dhaka city area. The proportion was not considered strictly in terms of socio-economic status index (education, income, profession and capability of family expenditure). These limitations may claim for further study with better methodological sophistication. Nevertheless, the knowledge of the study makes awareness about some facilitator and inhibitory factors of women's participation in employment. In light of such awareness, the vocational programme for women and the appropriate child-rearing techniques may be suggested so that the existence of facilitator factors is increased.

Notes and References

1. Qazi S. M. Ilyas, "Women's participation in employment: Its history and determinants of Empowerment*," Women for Women,* vol. 4, 1997, pp. 31-52.
2. International Labour Organization (ILO), 1993.
3. *Statistical Yearbook of Bangladesh*, 11th edition, Bangladesh Bureau of Statistics (BBS), 1990.
4. *Statistical Yearbook of Bangladesh*, 28th edition, Bangladesh Bureau of Statistics (BBS), 1990 March 2008.
5. Ilyas, op. cit (ref.1).
6. David G. Winter, Abigail J. Stewart and David C. McClelland, "Husband's motives and wife's career level," *Personality and social psychology,* vol.35, 1977, pp.159-166.
7. Arland Thornton, Duane F. Alwin and Donald Camburn, "Cause and consequences of sex role attitudes and attitudes change," *American Sociological Review* , vol.48, 1983, pp.211-227.
8. Carol S. Aneshensel, "Marital and employment role strain, social support and depression among adult women," in S.E. Hobfoll (ed), *Stress, social support and women* (Washington, Dc: Hemisphere Original edition, 1986), pp.99-114.
9. Qazi S. Md. Ilyas, "Determinants of Attitude towards Female Employment among Women in Bangladesh," *Bangladesh Psychological Studies,* vol.10, 2000, pp.11 - 34.
10. Doris K. Katelman and Larry D. Barnett, "Work orientations of urban middle-class married women," *Marriage and the Family,* vol. 30, 1968, pp. 80 – 88.
11. Qazi S. M. Ilyas, "A new scale for measuring attitude towards female employment," *Bangladesh Psychological Studies*, vol. 4, no. 2, 1992, pp. 72-83.
12. Andrew B. Crider and others, *Psychology*, (New York: Harper Collins, 1983).
13. Nancy Pistrang, "Women's work involved and experience of new motherhood," *Marriage and the Family*, May 1984, pp. 433-447.
14. Bernard E. Whitley, "Masculinity, femininity and self-esteem: A multitrait, multimethod analysis," *Sex Roles*, Vol.18, 1988, pp.419-431.
15. Arnald Thornton and Deborah Freedman, "Changes in the sex-role attitudes of women, 1962-1977: evidence from a panel study," *American Sociological Review*, vol.44, 1979, pp. 832-842.
16. Thornton, Alwin and Camburn, op.cit (ref.7).
17. N. Uddenberg, and L. Nilsson, "The longitudinal course of para-natal emotional disturbance," *Acta Psychiatrica Scandinavica*, vol. 52, 1975, pp.160-169.
18. Felice N. Schwartz, "Management women and the new facts of life," *Harvard Business Review*, 1989, pp.65-76.
19. Peter Meiksins and Peter Whalley, "Putting work in its place: A quiet revolution", (Ithaca, NY: Cornell University Press, 2002).
20. Marcia Houdek Jimenez, "Relationships between job orientation in women and adjustment to the first pregnancy and postpartum period," doctoral dissertation, Northwestern University, 1978.
21. *Penguin Dictionary of Psychology,. 1995*.
22. James S. House, *Work stress and Social Support* (Reading, MA.: Addison-Wesley Pub. Co., 1981).
23. Marcia Gruis Killien, Barbara Habermann and Monica Jarrett, "Influence of employment characteristics on postpartum mother's health," *Women & Health*, vol. 33, 2001, pp. 63-81.
24. Marcia Gruis Killien, "The role of social support in facilitating postpartum women's return to employment," *Obstetric, Gynecologic, & Neonatal Nursing*, vol.34, no. 5, 2005, pp. 639-646.
25. Richard S. Lazarus and others, "Stress and adaptation outcomes: The problem of confounded measures," *American Psychologist*, vol. 40, 1985, pp. 770-779.
26. Pamela L. Jordan, "Differences in network structure, social support, and parental adaptation associated with maternal employment status," in K. M. Swanson –

Kauffman (ed), *Women's work, families and health: The balancing act* (Washington, D.C: Hemisphere, 1987), pp. 33 –50.
27. Thomas A. Wills, "Supportive functions of interpersonal relationships," in S. Cohen & S. L. Syme (eds), S*ocial support and health* (San Diego, CA: Academic Press, 1985), Pp. 61-82.
28. Rosalind C. Barnett, Nancy L. Marshall and Judith D. Singer, "Job experiences over time, multiple roles, and women's mental health: A longitudinal study," *Personality and Social Psychology*, vol. 62, 1992, pp. 634-644.
29. Weber J. Stephen and Cook D. Thomas, "Subject effects in laboratory research: An examination of subject roles, demand characteristics, and valid inference," *Psychological Bulletin, 77*, 1975, pp. 273-295.
30. Killien, Habermann and Jarrett, op. cit (ref. 23).
31. Aneshensel, op.cit (ref. 8).
32. Dwenda K. Gjerdingen and Kathryn M. Chaloner, "The relationship of women's postpartum mental health to employment, childbirth, and social support," *Family Practice*, vol. 38, 1994, pp. 465-472.
33. A Khan and A. Amanullah, "Impact of Major Ongoing WID Projects" (Comilla: BARD, 1998).
34. Begum A. Shameem and Biswas K. Tuhin "Women's employment and fertility" (Comilla: BARD, 1998).
35. Cynthia D. Fisher and Richard Gitelson, "A Meta-analysis of the correlates of role conflict and ambiguity," *Applied Psychology*, vol. 68, 1983, pp. 320-333.
36. Zhiqi Chen, and Frances R. Woolley, "A Cournot-Nash Model of Family Decision Making," *Economic Journal*, vol. 111, October 2001, pp. 722-748.
37. Linda Mayoux, "Microfinance and the empowerment of women: A review of key issues," ILO, Social Finance Unit, Geneva, retrieved 4 September 2005, from <http://www.ilo.org/public/francais/employment/finace/papers/mayoux.htm 2000>.
38. Ilyas, op. cit (ref.11).
39. Qazi S. M. Ilyas and S.S. Jaman, "Development of a scale for female role perception," *Social Science Review*, Dhaka University Studies, part D, 5, 1988, pp.170-187.
40. Qazi S. M. Ilyas, "Bengali version of social relation scale of Turner et al, (1983)," (unpublished manuscript, Department of Psychology, University of Dhaka, 2001).
41. R. Jay Turner, B. Gail Frankel and Deborah M. Levin, "Social support: Conceptualization, measurement & implications for mental health," *Research in Community & Mental Health*, vol. 3, 1983, pp. 67-111.
42. Katelman and Barnett, op. cit (ref.10).
43. Ilyas, op. cit (ref.11).
44. Pistrang, op. cit (ref.13).
45. Meiksins and Whalley, op. cit (ref.19).
46. Thornton and Freedman, op. cit (ref.15).
47. Valerie Kincade Oppenheimer, "Demographic influence on female employment and the status of women," in Joan Huber (ed), *Changing Women in a Changing Society* (Chicago: University of Chicago Press, 1973), Pp. 184 – 199.
48. Jimenez, op. cit (ref. 20).
49. Thornton, Alwin and Camburn, op. cit. (ref.7).
50. Schwartz, op. cit (ref. 18).
51. Meiksins and Whalley, op. cit (ref. 19).
52. Killien, Habermann and Jarrett, op. cit (ref. 23).
53. Killien, op. cit (ref. 24).
54. Irwin G. Sarason and others, "Assessing social support: The Social Support Questionnaire," *Personality and Social Psychology*, vol. 44, 1983, pp. 127-130.
55. Lazarus and others, op. cit (ref. 25).
56. Barnett, Marshall and Judith D. Singer, op. cit (ref. 28).
57. Gjerdingen and Chaloner, op. cit (ref.32).