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The Indus Papers

Gilgit-Baltistan: Melting Water Towers of the Indus

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IPCS Discussion Paper



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Gilgit-Baltistan

Melting Water Towers of the Indus

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Gilgit-Baltistan, (GB) perched in-between world's highest mountain ranges that of Pamir, Himalayas, Karakoram and the Hindu Kush and wedged between Pakistan and India's long running conflict, is facing myriad of sustainability challenges including the climate change which now threatens faster melting of glaciers – source of life giving water for GB's 2 million inhabitants as well as over 170 million Pakistanis downstream. GB's glaciers and snow deposits are principal source of Indus water.

The paper will discuss the challenges and impact of climate change over Indus River's freshwater reserves, and how the economic and ecological well being of the GB's own once remote yet self sufficient mountain communities is facing climate change induced natural disasters, food and energy security, degradation of ecosystems and weak adaptation and mitigation capacity.

GB's mountain ecology plays vital role in influencing South Asia's regional weather pattern by intercepting the circulation of air thus regulating the monsoon system. But it plays an even more decisive role in storing the most precious element on earth, fresh water. About 10 to 20 percent of GB is covered by glaciers. Between 30 to 50% of the Karakoram Range (GB's main mountain system) is glaciated, compared to the Himalaya (8-12%) and European Alps (2.2%). An additional 30 to 40 percent of the region has seasonal snow, which represent a significant frozen fresh water reservoir that last from a single season to several decades through gradual accumulation. The glaciers and snow covers are crucial for the Indus Basin and form the major part of Indus River's perennial flow. GB's four tributary rivers (Shigar, Shyok, Hunza, Ghizer/Gilgit) and countless streams constitute the main source of the river's flow. Between 40 to 70 percent of the total run off of the upper Indus and its tributaries occur in July-August when the discharges are 15 to 40 percent more than in March. GB contributes about 50 billion m³ or 72 percent of the mean annual flow of the Indus as measured upstream of Terbela dam – Pakistan's and one of the world's largest land-filled dam and hydropower project.

GB's mountainous ecology is dotted with some of the world's largest glaciers outside the polar region. More than half of GB is located above 4500 meters. The prodigious glaciers situated in GB such as Biafo, Hisper, Batura, Baltoro, Gashabrum and Chogolungma, many of them about 40 to 70 km long) are also reportedly retreating at a fast pace. The Siachan glacier is deteriorating at an alarming pace as it has turned into the world's highest battleground and is incessantly abused with human waste and military hardware.

Thus GB is vital contributor of the Indus River's flow on which Pakistan's agriculture and hydro-electricity depends. However, tapping the full potential of GB's hydroelectric power estimated by international development agencies to be over 50,000 megawatt is yet to happen, due to host of reasons including GB's rugged terrain, distance from the load centers, transmission costs, and the region's rather disadvantaged administrative set up and still evolving political structure.

Spanning over a large area of 72,496 square kilometres (sq km), GB borders with China in the north, Tajikistan (via the narrow wakhlan strip) in the northwest, Afghanistan in the west and Indian administered Kashmir in the east – all of them energy deficient economies.

As a result of political dispute between India and Pakistan over Kashmir, GB has a special administrative status. The Gilgit-Baltistan Empowerment and Self Governance Order issued by the Prime Minister of Pakistan in 2009 makes GB a 'province-like' entity but with a mix of features accorded to the Government of Azad Jammu & Kashmir (AJK). But unlike GB, AJK has its own Prime

Minister and President overseeing the governance under a Provisional Constitution over 13,297 square kilometer area located between Pakistan's Punjab & Khyber Pukhtunkhwa provinces and the Indian administered Kashmir valley. AJK is the watershed for Jehlum and Neelam rivers, two major tributaries of the Indus system. GB on the other hand is administered directly under a Legal Framework Order (LFO) issued and amended by the Prime Minister of Pakistan from time to time. Water, like energy and minerals, falls under the list of the GB Council chaired by the Prime Minister of Pakistan.

Comprising of 7 districts, GB's administrative capital is based in Gilgit town. The region's population is estimated to be between 1.5 to 2 million. Still a relatively low density of 12 people per sq kilometers which is 30 percent lower than the Punjab province. Majority of the people live in the rural areas but over the years migration from within the region and from rest of Pakistan (for business, employment and recreation purposes) to the urban townships such as Gilgit, Skardu, Gahkuch, Chilas and Khaplu has been mounting steadily. About 40 percent of the population has access to piped water supplies. Each district has its distinct identity and the people have variety of cultural, religious, ethnic and linguistic roots. For instance, in the Baltistan region people speak Balti, an archaic form of Tibetan, while in the Gilgit region, within a radius of 150 km, people converse in four different languages. The religious mosaic is equally diverse with Sunni Muslims living in Diamer; Ismailis in Hunza and Ghizer; and Shias and Noorbakbshis in Ganche, Baltistan and the Nagar valley.

On a Highway to Insecurity

The key to survival of the region is the environment and the lives of the local communities are built around the Indus River and its tributaries. The economy is essentially natural resource-based. Over the centuries, the local people have adapted to the high-risk and low productivity of the mountain environment and evolved survival techniques. To cope with the fragile ecosystem and to make the best use of scarce resources they maintained a stringent control over their natural resources and used it frugally. They rationed demand pressure on resources and restricted extraction levels in keeping with subsistence needs. This was because they had a high stake in the productivity of the immediate environment.

But a swift decline in ecology-driven responses over the last few decades particularly in the wake of GB improved connectivity with the outside world (rest of Pakistan and China through the Karakoram Highway (KKH)) and also India-Pakistan conflict over Siachan in 80s have resulted in rapid material progress but also over-extraction from the resource base. The sudden exposure led to the collapse of the self-contained society and the ecosystem came under severe stress with a breakdown of resource-regenerative and diversified production systems. Instead of leading public policy to allow people to manage and benefit financially from their resources, the market economy moved in to discount people's role and alienated them from using their natural resources as a survival base to regenerate their economy; a move that has specially pauperized the poor. The biophysical environment of the GB is characterized by a high degree of constraints that necessitate self-sufficiency.

Market integration of this isolated area has been erratic and so have investments in key infrastructure and the institutions including in the water sector. The potential of agriculture, dairy and poultry, livestock, fruit cultivation, forestry, eco-tourism, minerals and hydropower to generate sustainable livelihoods and economic reform is as yet to be fully utilized.

KKH, the 1,284 kilometer highway built in the early 1980s that connects Pakistan to China have brought many blessing and blights altering GB's socio-economic contours. For centuries, the ancient silk route provided the only link to the areas now constituting GB with the outside world. The armies of Alexander, pilgrims taking the message of Buddhism to China, caravans of spice and silk traders and explorers and spies of the Russian and British empires have all trod this path. They bought new ideas and influences that impacted the lives of the people. But the changes were slow and imperceptible. But the highway brought a swift and dramatic transformation unleashing an avalanche

of socio-cultural and economic changes in the absence of a matching governance and political framework to enable the locals cope with the dramatic changes. With no lead-time or power to amend their age-old coping strategies or to evolve new ones, the resilience of the fragile economy is facing a collapse. There is a need to open up fresh sectors to compensate for the loss of opportunities or to create new avenues to cope with new challenges posed by social, economic and climate change events taking place in the region. GB's intractability is a challenge by itself. Fiats of events have, however, thrown open this self-sufficient, highly integrated and sustainable society of centuries, without warning and without placing safety nets, to a variety of external influences.

The KKH follows one of the ancient silk routes along the valleys of the Indus, Gilgit and Hunza rivers to the Chinese border at the Khunjerab Pass and then crosses the high Central Asian plateau before winding down through the Pamirs to Kashgar at the western edge of the Taklamakan desert. On the one hand, the KKH has boosted income opportunities for locals providing market access in China and rest of Pakistan but simultaneously it also created unique challenges including import of violence, drugs and even ferocious terrorist attacks, many emanating from Pakistan's Tribal Areas and Afghanistan that now jeopardizes the once peaceful and integrated communities. For instance, on 28 February 2012, 18 local going home from Islamabad were pulled out from the bus on the KKH, and after an identification parade determining their ethnic and sectarian outlook were lined up and shot point blank. On April 3, again 21 innocent travelers were brutally murdered in the same fashion near the Babusar pass.

As for people's vulnerability to natural hazards, on 4 January 2010 a massive landslide at Attabad village about 14 kilometers upstream of Karimabad in Hunza valley blocked the flow of Hunza River. The landslide killed 20 and displaced 6000 people. The water also inundated over 12 kilometers of the KKH cutting off thousands in upper Hunza from rest of Pakistan and who had to depend on Chinese across the Khunjerab Pass for food supplies and other basic amenities. In case of a disaster of similar nature taking place along the Indus River in Baltistan region can cause a bigger and more tragic situation as unlike upper Hunza which had the Chinese side of the border open and accessible to locals, Baltistan region's traditional road links with Ladakh region and the Kashmir valley remain closed for the last over 60 odd years, hostage to the broader India –Pakistan conflict.

Livelihood and Sustainable Development

Majority of the population still practice subsistence agriculture, small irrigated fields watered from glacier melts. Earlier, farmers used to follow an integrated approach and cultivate crops and fruits, maintain livestock and make use of the resources of the forest. This dictated the land-use pattern. People had rich harvests as they made best use of their environment. But when the economy was opened out, this integrated homegrown system of management was unable to compete with the external demands. Farmers were pressured to adopt unsustainable agricultural practices.

Irrigation is the single largest consumer of water. According to the agriculture census conducted in 1990, only two per cent of the land in the Northern Areas is cultivable — of which only one per cent is currently under cultivation. Studies show the remaining land can be cultivated but only if water is harnessed, which highlights irrigations key role in sustaining the subsistence agriculture and food security. Over the past 60 years, GB population increased fivefold leading to seven fold increase in use of water for human purposes.

However, over the years agricultural measures are increasingly directed towards short-term results and little has been done to enable people to use their land in a sustainable manner or increase the value of investments in the natural resources, environmental degradation set in.

Intelligent use of water has been the cornerstone of this economy as many crops have a short growing period; after the glaciers melt and before it snows. The mountain environment naturally evens out the rate of water flows between the wet and dry seasons and people earlier mould their water use patterns in accordance to the nature of the mountain ecology. Their irrigated land usually consisted of small terraced fields that exploited glacial melt for water. Agricultural patterns varied throughout the region and depended on the elevation of the area. At lower altitudes farmers grew both summer and winter crops but on higher elevations only summer crops were possible. Wheat, maize, potatoes and vegetables are the main crops. Wheat is the most important cereal; its cultivation begins in winter and is harvested mid-summer. It takes care of the food and fodder requirements. The average yields tend to be between 1,300 kilograms per hectare (kg/ha) depending on the altitude of the farming zone. While a few farmers still follow old water use and agricultural patterns, it is not possible for many others because of increasing demands. Change in water use and land use patterns and government apathy to keep alive the tradition of frugal water use, improve investments in local water harvesting structures, and facilitate a step up in food productivity by supporting cultivation of crops that use minimal water have worked as real disincentives.

Despite pressure to produce more, farming is still done using traditional methods and the land is prepared manually or in few rare cases using draught animals. Although tractors are available in quite a few valleys and towns, their use to plough land and thresh wheat is limited as land holdings are extremely small or situated on terraced slopes. Farm activities like sowing, thinning, weeding and fertilizing are done by hand. People preferred organic manure earlier but easy availability of chemical fertilizers has increased their usage.

Variety of vegetables of varying quality is grown in the region: potatoes, peas, beans, cabbage, radish, cauliflowers and tomatoes. Fruit trees like apricots, almonds, grapes, cherries, apple, peaches, walnuts and mulberry are lined along the fields as well as courtyards in homes. In recent years, fruits particularly dry fruits, and nuts have become an important source of income. Farmers rely on glacier melt to grow fruits and irrigate their fields. This also holds true for the nascent fishery industry which is beginning to emerge as an important economic activity as the area's rivers, lakes and streams are teeming with delicious trout.

Approximately four per cent of the region is estimated to be under natural forest cover. The region has four kinds of natural forests: sub-tropical scrub, dry temperate coniferous, dry temperate broad-leaved and sub alpine forests. Increasing demands for fuel, fodder and construction material is ravaging these forests. The extreme climate of this region, however, retards swift regeneration of natural forests. Extensive deforestation has meant loss of habitat for people who live in and around the forests and a drain in its biodiversity has meant loss of livelihoods for people who depend on its products to earn a living.

Reviving GB's Water Rights

GB needs a comprehensive and sustained effort to protect region's fledgling resource base including its precious water bodies available in the form of glaciers. Stronger and more efficient institutions and policy frameworks needed to help fuse the management of natural resources and ensure sustainable development by recharging the existing irrigation system and explore innovative and indigenous means of water harvesting to solve the problem of barren lands along major rivers and streams to ensure food security at the local level. Given the sensitive mountain ecology, impact of climate change and other challenges, effective adaptation and mitigation strategies and measures led by local communities and administration should be put in place.

Meantime, Islamabad and Delhi should continue engage to find ways to disengage from the Siachan glacier and to give the sensitive and precious glacier system a respite. And finally, now that Gilgit-Baltistan has an upgraded governance arrangement, GB should be given a seat on the decision making table at the country level, specially on water related future treaties, domestic inter-provincial water

accords, and mega plans and projects such as Diamir Bhasha dam, and or Bunji dam etc so that local communities' environmental and economic rights over Indus could be safeguarded.

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