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Research & Insights

The Dunning-Kruger Effect of GB Field Tour: a laboratory for thousands of natural experiments

Field-based reflections based on the NCGCL × KRN horticulture study in Gilgit-Baltistan

The Hubris of Certainty

Every few years, development debates in Gilgit-Baltistan rediscover the same question: what, exactly, is the right model for agricultural transformation? Each new project arrives with its own conviction. Some may champion tunnel farming to raise vegetable output for the tourism sector. Others push packaging and storage to curb cherry wastage. A third may point to freight costs, arguing that cheaper transport would lift farmer margins more than any on-farm intervention ever could.

Elsewhere, solar dryers are proposed to replace the legacy and time-consuming sun-drying of fruits; others see promise in pulping and processing units. Small factories that could turn fruit into jams, juices, candies, or even granola bars. Still, others argue the region must standardize varietal selection to reach commercial scale. Others insist its strength lies in preserving indigenous varieties that represent heritage and identity. Cooperatives are described as a grassroots solution by some, and as “pyramid schemes in disguise” by others.

Is the real constraint energy, storage, markets, or finance? And which, if solved first, would unlock the greatest return?

Sometimes, the honest answer is to not have one. And perhaps that is the humbling lesson: in complex ecosystems, uncertainty is not a weakness in policy design. The impulse to find a single answer: one scalable model, one replicable formula, is itself the problem.

The Paradox of Promise

In many ways, Gilgit-Baltistan should have been an easier development challenge than the rest of Pakistan. The region ranks high on almost every social indicator that elsewhere explains poverty and stagnation. Literacy rates exceed ninety-five percent by some accounts, and levels of female education are well above the national rural average.

It is also not short on institutional experience. For decades, the Aga Khan Development Network has built one of the most extensive community infrastructures in the country, organizing village and women's groups, introducing microfinance, and demonstrating models of collective resource management. Similarly, initiatives such as the Economic Transformation Initiative (ETI-GB) have added hard infrastructure: roads, irrigation channels, and value-chain grants meant to link tens of thousands of farmers to markets.

On paper, few regions in the country combine such social capital, donor legacy, and geographic advantage. Cross-border linkages with China, a cohesive yet open culture, and a market-oriented ethos should have made it a natural testing ground for enterprise-led growth. Even its credit cooperatives, which consist of hundreds of member-run savings and credit groups, represent an indigenous base for formal financial intermediation.

Yet progress remains shallow. Agriculture in the region continues to oscillate between pilot projects and dependency, rarely compounding into self-sustaining growth. Bank lending in agriculture is negligible, logistics thin, and private investment episodic.

The contradiction is hard to miss: farming in Gilgit-Baltistan looks institutionally ready for take-off, but every attempt to lift it off the ground seems to stall.

The Illusion of Simple Answers

The simplest explanations often turn out to be the right ones. Yet, simple solutions to problems with complex socio-political roots almost always end in failure.

Gilgit-Baltistan's agricultural landscape is a case in point. It is not waiting to be saved. Based on anecdotal evidence from stakeholders across Gilgit, Hunza, and Skardu, **agriculture represents less than one-third of average household income** in the region. A significant share of GB's population already lives as diaspora, well-adjusted in higher-value vocations such as teaching, nursing, banking, tourism, hospitality, and small entrepreneurial businesses in urban centers across Pakistan and abroad. The **remittance and service economy, not farm income, underwrites much of household stability.**

A more cynical yet perhaps more realistic view would be that GB's economy is waiting for a massive external shock. For decades, the **region has been cushioned by extraordinary fiscal privileges,** the most striking of which is the wheat subsidy extended by the federal government to GB, Azad Jammu and Kashmir, and the erstwhile FATA districts. The quantum of that subsidy defies belief: a 40-kilogram bag of wheat in GB reportedly costs around Rs 650 per maund under the program, compared to roughly Rs 4-5,000 per maund across the rest of the country.

That subsidy is perhaps one reason why **GB appears to have already transitioned to higher-value horticulture while much of Pakistan's farm economy remains trapped in the low-value loop** of wheat, cotton, and rice. The 'nearly-free grain' cushion has allowed GB's farmers to take risks and diversify into cherries, apricots, and apples without jeopardizing household food security.

Many on-ground stakeholders proudly recounted this transition. Their forefathers, they said, reaped no more than twenty maunds of wheat or maize per acre, worth perhaps Rs 150,000 per annum in today's grain value. On the same land, by switching to fruit orchards and adopting progressive practices, they now earn as much as Rs 1 million per annum. The contrast is astonishing: and a genuine tribute to the ingenuity and determination of GB's farmers, more than three-fourths of whom are women.

Yet, like most things in Pakistan, it also represents a colossal waste of opportunity. By farmers' own accounts, up to 90 percent of mulberries, more than half of apricots, and a similar share of cherry output is lost every year to post-harvest spoilage. The causes are depressingly familiar: lack of packaging material, cold storage, grading facilities, and the extreme perishability of fresh produce.

If GB's horticultural promise truly held such potential, the last four decades **offered a rare chance to pilot a real-world experiment in cross-subsidy, by using a food-security subsidy (wheat) to incubate higher-value fruit-processing industries.** Had physical and financial infrastructure been developed for pulping, juicing, drying, or concentrate production, GB could have gradually reduced its reliance on wheat and power subsidies while building a self-sustaining export economy around its horticultural base.

Instead, decades of state neglect of development goals have reinforced a culture of self-reliance born of mistrust. The roots of distrust in governance run so deep that many orchard owners claim to dry and store up to forty percent of their own apple produce for winter use, insurance against road closures and state failure.

The implication is stark. Any change in this regime: whether through fiscal rationalization, subsidy withdrawal, or transport disruption, could alter the economic calculus of thousands of households almost overnight. It would not only reshape household food security but could **also trigger a reversion from high-value horticulture back to subsistence grain cultivation.** In other words, agriculture in GB is not a primary livelihood waiting to be upgraded; it is an auxiliary income dependent on the stability of a heavily subsidized food system.

The lesson then, it would seem, is to **turbocharge the process of value-chain development** with the steroids of well-designed interventions, before the fiscal lifeline that sustains GB's experiment is withdrawn for good.

Predictably, the "right" answers appear self-evident: support the development of local storage, pulping, and processing units; create market linkages; capitalize on the region's literacy, organization, and work ethic; and enable the local economy to graduate quickly into a higher-value equilibrium.

Yet humility demands restraint. A five-day field tour cannot presume to know all answers: least of all in a territory where the footprint of donor and development programs is more common than madrassahs in the mainland. Surely, the realization that wasted pulp could be saved, processed, and branded into value-added products is not rocket science. It is a thought ordinary enough to have occurred to dozens of donor-sponsored studies that came before us.

The question, then, is not what should be done — that much has been known for years — but why it still isn't or hasn't.

And that is where Gilgit-Baltistan's well-touted and seemingly superior distinction over mainland Pakistan ends. **Beneath the literacy rates, cooperatives, and donor experiments lie the same binding constraints that afflict the rest of the country: land fragmentation, contract insecurity, and institutional distrust.**

Case: Naik Alam and Tunnel Vegetables in Danyore, Gilgit

The **average farmland holding** in GB, according to the Aga Khan Economic Planning Board, is a **scarily small 4.5 - 5 kanals**. Yet even this bottleneck is not insurmountable for progressive growers. Consider our introduction by AKEPB Gilgit to **Naik Alam**, a farmer in Danyore who inherited barely an acre of family land. Using modern tunnel-farming techniques, Alam now **harvests 30 to 45 tons of vegetables** mainly, cucumbers, onions, and spinach, **ten times the annual output** in volume (and maybe even more in value) of neighboring wheat and maize plots.

Having already stretched the limits of organic growth, Alam's natural next step should be **to lease additional land, replicate his tunnels,** and scale up. But here begins the systemic choke point: contract enforcement. Once they see production succeed, landowners often attempt to repossess leased plots, a risk earlier mirrored in the banana plantations of **Indus Acres, Tando Allah Yar**. In such an environment, even the most steely-resolved entrepreneur faces an impossible financing puzzle: unless he is able to scrape together equity, which bank would underwrite debt against an asset it cannot legally secure?

This is where the illusion of easy fixes collides with the hard geometry of Pakistan's governance. The barriers are not agronomic but institutional. The missing scaffolding of enforceable contracts, collateral frameworks, and predictable regulation that make private investment possible. And yet, every visiting team continues to design interventions as if the problem were purely of technology or finance.

Case: Frasat Shah and Japanese Fuji Apples in Gulmit, Upper Hunza

Consider the experiment of **Frasat Shah in Gulmit, upper Hunza.** A retired teacher trained in horticulture in Japan, Frasat brought back grafts of Fuji apples, which he planted on his 6-kanal family farm. Over the last 15 years, he has turned that smallholding into a commercially viable orchard, selling directly to the small number of Japanese families living in Islamabad and elsewhere through his Facebook page.

Frasat has also succeeded in popularizing the variety across Gulmit, giving away saplings for free. Today Frasat serves as a local master trainer, advocating **organic farming** and demonstrating its promise for higher-value returns.

Yet the **absence of any certification or traceability infrastructure** means that promise remains theoretical. Without recognized organic standards, grading protocols, or geographic indications, the price premium that should accrue to growers like him is captured instead by intermediaries. By his own account, “aggregators from the mainland buy our orchards at dirt prices during the picking season.” Knowing the real value of their produce but unable to realize it, many farmers, Frasat included, prefer to **dry and store a portion of their apples for winter subsistence** rather than sell into an opaque market.

The pattern repeats across GB: technical success stories without institutional backing. Each progressive farmer demonstrates capacity and ingenuity; each also exposes the structural vacuum that prevents replication. It is not knowledge that is missing, it is the system that allows knowledge to translate into sustainable value.

Case: The China Illusion

Take the **false promise of free trade with China.**

To our surprise, we discovered that Gilgit-Baltistan enjoys a special status not only within Pakistan but also with China. Citizens of GB have visa-free access to the Xinjiang region, a privilege that survives even after Beijing's tightening of internal controls. Goods trade between Xinjiang and GB is duty-free as well. Given that Hunza is just **132km from Tashkurgan Khunjerab Airport** via the Karakoram Highway, against 570+ kilometres away from Islamabad, **trans-shipment through Chinese territory should become the obvious export gateway** for GB's high-value fruits. Yet it has not.

The reason is both technical and political. Pakistan's weak **sanitary and phytosanitary (SPS)** regime inspires little confidence across the border. According to multiple stakeholders, the only way dried apricots from GB enter Xinjiang is when they are **mislabeled as Afghan origin.** Worse still, instead of Chinese buyers importing GB's exotic varieties, grafts of those very fruits have already been transplanted and are now being cultivated commercially within Xinjiang itself.

In other words, even where geography, trade status, and diplomacy appear to offer a head start, the absence of credible certification, enforcement, and institutional follow-through turns comparative advantage into leakage. GB's proximity to China, far from being an export gateway, has become a mirror reflecting Pakistan's chronic inability to convert opportunity into sustained economic gain.

Structural Core of Findings

Drawing across interviews and site visits, common themes recur.

- **Institutional vacuum:** Borrowing via scheduled commercial banks in agriculture is non-existent. The largest local intermediary, **Karakoram Cooperative Bank,** operates under **the Societies Act** and outside prudential supervision.

- **Project dependence**: ETI and AKRSP built social organization but not durable financial intermediaries. Cooperatives lack working governance and monitoring depth.

- **Infrastructure deficit:** There are no packhouses, reliable dryers, or cold chain nodes at farmgate. Electricity shortages are acute in winter due to lack of hydroelectric power.

- **Gender and labour:** Women perform most orchard work.

- **Policy contradictions:** Subsidies encouraged diversification initially, but have failed to provide the incentive to scale up.

- **Climate and seasonality:** Late frosts and unseasonal rain harm fruiting and drying. Winter outages paralyze processing.

- **Varietal strategy:** Tension between heritage varieties with premium storytelling and standardized clones that aid scale.

- **Certification gap:** Organic narratives cannot convert into price premia without testing and traceability.

- **China market mirage:** Paper access without credible SPS and traceability.
- **Tourism demand gap:** Import poultry, red meat and many vegetables because local supply chains cannot meet rising demand.

Pockets of Intervention, but No Silver Bullets

NCGCL cannot repair governance. It can build plumbing that endures within it. Stakeholders asks include:

- **Build a micro pilot registry.** Fund many small, time bound experiments. Track outcomes, scale successes, retire failures.
- **Support micro processing and grading.** Anchor value chain finance in small pulping, packaging, and drying units.
- **Link energy to credit.** Solar hybrid finance for dryers and cold rooms.
- **Dual credit tracks.** One for compliant conventional production. Another for organic transition with longer tenor and certification support.
- **Guarantee finance for aggregation.** Rather than atomized farmers. Work with cooperatives, processors, and packhouses.
- **Engage AKRSP as proto clients.** Leverage social capital and AKRSP partner cooperatives as a de-risking substitute in early pilots.
- **Advocate for regulated cooperative banking.** Seek a framework under SECP or SBP. Avoid guarantees to unregulated deposit takers.
- **Enable tourism linked supply chains.** Finance tunnel farms or even greenhouses; local meat or poultry processing to replace unsafe imports.

Conclusion: Hope, but With Caution

Uncertainty about the path forward does not mean nothing can be done; it means that caution is essential. Fixing policy and regulation lies beyond NCGCL's scope, yet waiting for perfect policy is not a strategy. Even in the absence of systemic reform, NCGCL can still act.

Gilgit-Baltistan offers a controlled laboratory for many small but meaningful experiments. Its social cohesion, high literacy rate, and geographical diversity makes it an ideal testbed where errors are visible and lessons transferable.

Immediate fronts include reducing cherry and apricot losses through improved packaging and storage, financing solar dryers and modular cold rooms, supporting local pulping and jam units, piloting certifications for organic and heritage fruits, expanding tunnel farming for hotels and restaurants, and investing in small meat and poultry processing, given that much of GB's poultry and red meat is imported (from mainland Pakistan) and often handled poorly due to absence of cold storage (basic refrigeration/freezers).

GB's advantage is not simplicity but manageability. The challenge is not knowledge but the absence of institutions that can convert knowledge into continuity. **If approached with humility, and with a mindset focused on system design rather than hero projects, NCGCL can transform many small failures into an architecture of learning.**

That may be the only reliable antidote to the Dunning–Kruger effect: replace confidence with curiosity, and prescriptions with process.

Annexures. Stakeholder Meeting Summaries

Hunza Foods Processing Company Pvt. Ltd., Rahimabad, Hunza Valley

Profile: Originated as a trading business that transitioned into processing after a cancelled bulk order triggered product innovation. Received technical support from the Agriculture Department to refine recipes.

Key products and scale:

- Fruit jams: about 60,000 bottles per annum.
- Kilaow (dried snack): traditional product from Ghizer made from grape, mulberry, and walnut, historically a cereal substitute during wheat shortages. Current sales about 200 to 250 kilograms per day.

Insights: Market shocks can trigger diversification and value addition. Traditional food heritage combined with modern branding can scale. Killow signals latent demand for indigenous, functional foods that could expand with packaging, certification, and e commerce. This is a replicable local processor model where innovation arose from resilience rather than external design.

Shakoor Ullah Baig: Cherry pioneer, Oshikhandass, Danyore (Gilgit)

Background: 7 kanal holding. About 300 cherry trees. Orchard planted in the 1980s on land previously uncultivable. Early years included subsistence wheat and maize. Cherries were unknown and had no market at the time.

Transition to cherry: Started with four saplings bought for 25 paisas each. Faced local skepticism about soil health. Income moved from about Rs 25,000 to roughly Rs 900,000 to 1,000,000 per year. With cherry income he could buy about 300 maunds of grain instead of growing it. The demonstration effect led to regional adoption of cherries as a cash crop.

Agronomy: No till land. Clean irrigation water is critical. Muddy water harms trees. DAP is essential but expensive. A pest found in weeds attacks roots and lacks targeted local pesticide. Heavy fruiting in one year can reduce next year's yield and size. Trees fruit for about thirty years with gradual decline. Gestation to profitability is about five years. Active management is required.

Markets: Sells domestically to Rawalpindi and Islamabad. China channel unavailable due to compliance barriers. Oshkandas' early harvest reaches markets before Afghan cherries and earns a premium. Between April and May about 150,000 cartons a day move regionally, or roughly 10 to 12 truckloads. Aggregation is local. Large firms have not entered. Packing and storage are the weakest links. Cherries cannot be held beyond two to three days and lack cold chain, leading to high spoilage. Pomegranate may be the next promising crop.

Institutional gaps: Little institutional encouragement for expansion. AKRSP is no longer active in horticulture support. Growers need affordable fertilizer, targeted pesticides, clean water, and professional agronomy advice.

Lesson: Individual experimentation triggered a profitable regional shift without state intervention, but the ecosystem is fragile and limited by post harvest constraints and warming trends. Future cherry should migrate up valley.

Frasat Shah: Apple orchard farmer, Gulmit (Upper Hunza)

Background: Retired teacher in 2011. Studied organic apple farming and post harvest in Japan. Trained local women on orchard management.

Focus: Apples and apricots as primary crops. Potatoes and wheat secondary. Cherries rising in interest. Pear and almond expanding slowly.

Challenges: Uncertified imported saplings suffer high mortality. Post harvest losses are high due to lack of storage and processing. Power instability disables dryers. Small processors for juice and jam are absent.

Innovation: Introduced Fuji through grafting and local adaptation. Achieved sales to Japanese residents and diplomatic staff in Islamabad at Rs 3,000 to 5,000 per crate. Adoption requires pruning and training discipline. Acts as master trainer for grafting and maintenance.

Takeaway: Gulmit can produce high value apples but needs systemic post harvest infrastructure, solar drying, certification, and disease free propagation. Progressive farmers like Frasat can anchor demonstration and training partnerships.

Economic Transformation Initiative (ETI-GB) — Skardu region

Overview: Launched in 2016 as a partnership between the federal government, IFAD, and AICS. Total cost about $ 120 million. Designed as a comprehensive agricultural transformation program.

Core components:

- Infrastructure and connectivity to make about 70,000 acres cultivable and upgrade 400 to 700 km of rural roads.

- Value chain support through coordination with Agriculture and Extension Departments, social mobilization partners, and Land Revenue. Engagement with over 60,000 farmer households. Formation of about 160 Village Agricultural Cooperatives. More than Rs 2 billion on business proposals, feasibility, and cooperative operations.

- Access to finance and risk sharing through a Partial Credit Guarantee Scheme. VAC recommendations enable financing up to about Rs 500,000 with quick turnaround for inputs and working capital.

Structural challenges: Only about 2 percent of GB land is potential farmland. About 1.5 percent of that remains barren due to lack of irrigation. Certified inputs are scarce. Mechanization is limited. Post harvest handling and cold storage are weak. Forward linkages to markets and processors are missing. Technical training is insufficient.

Summary insight: ETI-GB shows a working model that combines land development and cooperative based credit facilitation. Gains remain constrained by limited cultivable land, input quality risk, and missing market integration. Future focus should scale the guarantee, expand irrigation and storage, and build agribusiness linkages.

Financial inclusion and credit systems: Karakoram Cooperative Bank (KCB)

Overview: Largest locally based institution, registered under the Societies Act rather than SBP or SECP. Lends to members or those recommended by members.

Field observations:

- Regulatory vacuum: no prudential norms, provisioning, or capital rules comparable to regulated banks.
- Governance weakness: minimal external audit or disclosure. Discretionary and politicized decisions.
- Deposit mobilization: forced savings model where borrowers must also be depositors.
- Credit allocation: personal and political influence common. Reports of nepotism and government interference.
- NPLs: no standardized classification or reporting. Defaults rolled over or informally written off.
- Operations: functions more like a large rotating savings circle than a regulated intermediary.

Risks:

- Ponzi like dynamics reported by multiple independent sources. Dependence on fresh deposits to service obligations.

- Public trust exposure without deposit protection.

- Political capture and misallocation.

- Inclusion paradox: member exclusivity limits new entrants and scale.

Implications for NCGCL:

- Map and separate member cooperatives from deposit taking intermediaries to avoid systemic risk.

- Avoid direct partnership. Use KCB as a cautionary example and advocate for a cooperative banking framework under SECP or SBP.

- Pilot guarantees only with licensed MFBs or bank subsidiaries that meet prudential standards.

Shazday Fruits (Pvt.) Ltd., Skardu: Haseena Batool Shigri

Background: MS Hons Agriculture with specialization in horticulture. Research on Helmand apricot showed about 45 percent post harvest waste. Company registered in 2018. Capital by Ovais Zuberi. Operations split between Skardu and Islamabad. Achieved ISO and Halal certifications by 2020. Diversifying into cereals, nuts, and herbal products.

Business evolution: Started with fresh apricots. Manual picking and shipping to Punjab. Consumer response was strong but **transport from Afghanistan to Punjab was cheaper than from GB.** Limited capital prevented cold chain. Pivoted to dried fruit. Expanded into dried cherries, dried apples, walnuts, and almonds. Developed processed products including a granola bar line now leading in revenue. Added dried mulberries, a crop with very high wastage. Working on buckwheat as a cereal for export.

Portfolio: Apricot, cherry, apple, mulberry, fig, persimmon, walnut, almond, millet, buckwheat, and selected herbs.

Sectoral challenges: Fragmented landholdings, non mechanized orchards, heterogeneous varieties, resistance to modern processing, lack of storage and packaging, and transport cost disadvantages.

Priority interventions: Establish pulping, storage, and quality based marketing for apricots. Design training for improved handling and drying. Invest in storage and processing. Build branding and market access for GB produce.

Ghafoori Fruit Orchards, Skardu: Muhammad Kazim

Overview: Horticulture is the principal cash earning subsector in GB, roughly 45 to 55 percent of agricultural income. Orchards are small, seasonal, and dependent on family labour and snow melt water. Post harvest losses exceed 35 percent due to poor drying, storage, and transport.

Apricot: Multiple local varieties under mixed orchards. Intercropping with grains is common. Rain during drying damages the crop. Sun drying on rooftops or fields coincides with wheat threshing and causes contamination. No organized dehydration or grading. Kernels are often discarded despite oil value. Fresh apricot trade is rare due to perishability and lack of cold chain. Women lead sorting and drying. Farmers are shifting to cherry for labour relief and quick cash. Needs include solar or mechanical dryers, collection centres, and kernel oil extraction. There is export grade potential if standards and aggregation improve.

Cherry: Introduced at scale about fifteen years ago and expanding around Skardu, Shigar, and Hunza. Labour needs are lower than apricot and returns are high. Harvest is late May to early July. Fresh fruit is sold without pre cooling or packhouses. Bruising and delays cause high losses. Entire orchards are often sold to traders on a lump sum basis. Short shelf life limits export. Air freight to Gulf has been tested but is uneconomic at small scale. Needs include collective marketing, cold storage, and low cost refrigerated transport. Micro packhouses and credit products tied to orchard on foot contracts are promising.

Apple: Concentrated in Hunza, Ghizer, Astore, and parts of Diamer. Local varieties dominate. Productivity is low due to aging trees and lack of pruning. Harvest is September to October. Storage is mostly in domestic cellars or basic crates without temperature control, causing losses of 25 to 30 percent. No controlled atmosphere storage or waxing in GB. Grading and packaging are minimal. Freight cost is high due to distance and poor back haul. Competitiveness is eroding against Iranian and Balochistan apples. Needs include orchard rejuvenation, high density planting, pruning, disease free nurseries, and potential juice or cider units once aggregation improves.

Cross cutting insights: Labour shortages due to youth out migration. No packhouses, drying tunnels, or cold chain nodes. No crop specific lending or warehouse receipts. Climate variability is rising. Women contribute heavily but remain outside formal finance.

Opportunities for NCGCL and policy design: Pilot guarantees for solar dryers, cold rooms, and packhouses through cooperatives. Develop value chain credit tied to offtake. Support aggregation and grading hubs linked to Karachi and Islamabad buyers. Enable warehouse receipt style lending for dried apricot and graded apple. Integrate climate adaptation finance such as frost nets and drip into guarantees.