

INDUSTRIAL VISION

INNOVATION. INDUSTRY. PROSPERITY

VOLUME 10.0 | 2025

Reviving Industries: Sustainable Path to Progress



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Honorary Consul of Iceland



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INDUSTRIAL VISION VOLUME 10

REVIVING INDUSTRIES:- SUSTAINABLE PATH TO PROGRESS



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Industrial Vision is an ISSN 2392-4330 certified annual industrial magazine published by Society of Industrial Engineering Students (SOIES) Nepal. The magazine shares research works, various interesting, timely and significant contents to address the broad spectrum of engineering and management solutions in all industries. This aims to help the manufacturing and service industries to improve productivity, develop long-term business goals, execute and lead new techno-commercial methods and principles; and ultimately help in the creation of wealth.

A note to readers

The views expressed in articles are the authors' and not necessarily those of Industrial Vision. Authors may have consulting or other business relationships with the companies they discuss.

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About Us

Society of Industrial Engineering Students - Nepal is a student-driven dynamic society dedicated solely to the support of the Industrial Engineering scholars, to bring meaningful collaborations with the industrial stakeholders, professions and individuals involved with improving quality, productivity, technology, industrial success and prosperity, thereby making a fundamental contribution to the creation of wealth. We incubate leadership, explore collaborative possibilities, and lead innovative vision through industrial engineering discipline to be followed in mainstream of sustainable development.

How we work?

We collaborate with industrial stakeholders, experts, and various industrious professionals to bring significant programs, discussions, seminars and many more events of great deal of education, development and economic importance.

We are organized to support the scholars in the industrial engineering discipline through regularly scheduled programs on fields of industrial engineering. "Society of Industrial Engineering Students-Nepal" serves as a forum for development, networking, information sharing, idea exchange and problem solving for the industrial engineering community.

We are dedicated to support the profession of industrial engineering and promote an increased awareness of the value of industrial engineers and lead the nation towards remarkable development.

We explore momentous sources of productivity improvement information via the Internet, publications, seminars, interviews and discussions including an annual magazine- 'INDUSTRIAL VISION' to find optimal and practical solutions, which contribute to the success and prosperity of an industrial undertaking, thereby making a fundamental contribution to the creation of wealth.



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We are Grateful to our Well Wishers



I am honored and delighted to see the stupendous work put in by Society of Industrial Engineering Students- SOIES Nepal, Thapathali Campus who has contributed to their 10th volume of Industrial Vision. The literary and commentary submitted by our students whether it be relating real life problems to Industrial Engineering or general awareness on diverse topics have been extremely knowledgeable. The magazine has time, and time again, has given an opportunity to present the creative minds of the students. I applauded the bridge again for bringing the wonderful minds of the students together to build such an enlightening magazine.

Wishing the magazine continued success, growth, and inspiration in the years ahead! May it captivate readers, spark creativity, and make a lasting impact. Here's to a bright future filled with compelling stories, innovative ideas, and endless possibilities.

Prof. Dr. Sushil B. Bajracharya
Dean, Institute of Engineering, Tribhuvan University

Congratulations on the incredible launch of the 10th edition of Industrial Vision! What a proud moment this is for everyone involved. Reaching ten editions is a remarkable achievement as it speaks volumes about your commitment, creativity, and teamwork over the years. This milestone is all about longevity and the lasting impact Industrial Vision has made in fostering ideas, sharing knowledge, and building a strong academic community.

This year's theme, "Reviving Industry: Sustainable Path to Progress," is timely as your focus on responsible industrial growth is both relevant and necessary. I'm confident this edition will spark meaningful conversations. This is a matter of pride for IOE Thapathali Campus. Wishing you all continued success as Industrial Vision keeps inspiring minds and shaping the engineers and leaders of tomorrow.

Dr. Khem Gyanwali
Campus Chief, Thapathali Campus,
Institute of Engineering, Tribhuvan University, Nepal



On the behalf of Department of Industrial Engineering, I extend my heartfelt congratulations on the successful release of the 10th edition of Industrial Vision.

This milestone reflects the dedication and creativity of brilliant team of SOIES Nepal. The theme, "Reviving Industry: Sustainable Path to Progress," is timely and impactful. We are proud of the initiative and professionalism shown by the entire SOIES Nepal team. May Industrial Vision continue to inspire future industrial leaders and innovators. I wish this volume the highest success and wide readership.

Er. Kamal Pokharel
Head of Department | Department of Industrial Engineering
IOE Thapathali Campus

I want to extend my warmest congratulations on the landmark 10th edition of your magazine, "Industrial Vision." Reaching a tenth edition is a remarkable milestone, representing a decade of your unwavering dedication and intellectual curiosity. I've always seen "Industrial Vision" as more than just a magazine; it's a vital bridge connecting our classroom theories with real-world industry practices and a true testament to the proactive spirit of students like you. SOIES Nepal work is a source of great pride for our entire campus community and inspires students across all disciplines. I am incredibly proud to see such an impactful student-led initiative thrive, and I truly commend your professionalism and vision. Congratulations once again on this outstanding achievement. I wish you a tremendously successful launch and look forward to seeing "Industrial Vision" continue to inspire for many more years to come.

Pralhad Khadka
FSU President 2081



It brings me immense joy and pride to extend my heartfelt best wishes on the launch of "Industrial Vision", the official magazine of the Society of Industrial Engineering Students-SOIES Nepal.

As the founding president of this remarkable organization, established in 2063 B.S. with a vision to empower Industrial Engineering students of Thapathali Campus, it is truly inspiring to witness how far we have come. SOIES Nepal was founded with a mission to create a dynamic platform for student welfare, industrial exposure, idea generation, and capacity building and seeing these values reflected in this publication is deeply fulfilling. I believe this publication will become a valuable voice for our students, capturing their ideas, innovations, and aspirations. To the editorial team, contributors, and all members of SOIES Nepal, congratulations on this milestone. May this magazine continue to inspire, inform, and ignite the spirit of Industrial Engineering in generations to come.

With warm regards and best wishes for continued success.

Prakash Acharya
Founding President
Society of Industrial Engineering Students-SOIES Nepal.

We extend our heartfelt congratulations to the team of Industrial Vision Volume 10 with a theme "Reviving Industries: Sustainable Path to Progress". As an institution committed to excellence in education, we are proud to support initiatives that promote knowledge, innovation, and national progress.

May this edition continue to ignite thoughtful conversations and drive positive change across Nepal's industrial landscape.

National Academy for Medical Education (NAME)





Tribhuvan University
OFFICE OF THE VICE CHANCELLOR

Kirtipur, Kathmandu, Nepal



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Message from the Vice Chancellor

I extend my warmest congratulations to the Society of Industrial Engineering Students-Nepal (SOIES-NEPAL) of Tribhuvan University, Thapathali Campus, on the publication of 10th edition of '**INDUSTRIAL VISION**'.

The theme, "*Reviving Industry: Sustainable Path to Progress*," reflects a timely and critical discourse. This edition, enriched by the voices of students, researchers, industrial experts, and national policymakers, stands as a testament to your commitment to shaping a more stable and forward-looking industrial future for Nepal.

Wishing you all continued success and impactful contributions to the world of engineering and beyond.


Prof. Dr. Deepak Aryal
Vice Chancellor

July, 2025



SUSTAINABLE DEVELOPMENT GOALS



1 NO
POVERTY



2 ZERO
HUNGER



3 GOOD HEALTH
AND WELL-BEING



4 QUALITY
EDUCATION



5 GENDER
EQUALITY



6 CLEAN WATER
AND SANITATION



7 AFFORDABLE AND
CLEAN ENERGY



8 DECENT WORK AND
ECONOMIC GROWTH



9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



10 REDUCED
INEQUALITIES



11 SUSTAINABLE CITIES
AND COMMUNITIES



12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION



13 CLIMATE
ACTION



14 LIFE
BELOW WATER



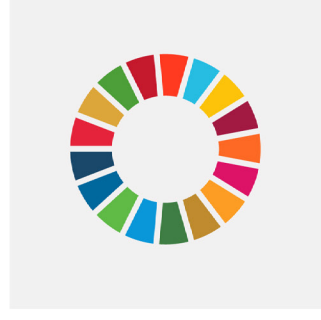
15 LIFE
ON LAND



16 PEACE, JUSTICE
AND STRONG
INSTITUTIONS



17 PARTNERSHIPS
FOR THE GOALS





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Message from President

In 2014, a group of students dared to dream, and Industrial Vision Volume 1 was born. Today, in 2025, we launch Industrial Vision Volume 10. A whole decade later.

This is more than just a number. This is a milestone. This is a moment. And this time, instead of only looking forward, we chose to look inward towards our own industries, our own people, our own potential. We chose to ask:

Where is Nepal's industrial journey headed? And where are we, the Industrial Engineers, in that story?



The answers aren't always easy. Somewhere between being taught to optimize efficiency, design better systems, and lead workplaces, we are often misunderstood. Sometimes even invisible. But this volume is a voice. A voice that says: We exist. We matter. And we are here to contribute.

The 17th Executive Committee was never just about continuing tradition. We wanted to challenge it with purpose. From launching 'Push Push: This is Industrial Engineering', to conducting field-level industrial estate research, to introducing the ErgoReignite Design Competition, every project was designed to make our presence felt, and our potential seen.

Alongside that, we worked quietly but steadily developing a website, hosting training programs, initiating MoUs, connecting alumni and organizing orientations for the next generation of thinkers.

But this magazine is the loudest thing we've done. It's not just about publication. It's a legacy. One built not by a few, but by a collective: students, alumni, faculty, and sponsors. Everyone who believed we were more than what we're seen as.

As I sign off from this role, I want to leave behind not just this edition, but a belief. A belief that Industrial Vision will continue to be the mirror, SOIES Nepal to be the platform, and the spark for the Department of Industrial Engineering. To everyone who stood with us, to everyone who believed us, to every student who supported us, thank you. And as the saying goes:

"Don't cry because it's over. Smile because it happened."

Today, I smile with pride.
Because we made it. Together.

Aashish Bhandari
President, SOIES Nepal
17th Executive Committee

Editor in Chief's Note

When we first sat down to discuss this magazine, we asked ourselves one big question, what does industry really mean to Nepal today? Is it just factories and its chimney? Just machines and the equipment? Or does it go deeper into our fields, our hospitals, our sports grounds, and also to our culture?

This volume of Industrial Vision is our attempt to explore exactly that.

As the Editor-in-Chief, I had the privilege of working with a passionate team who were not just writing but they were experiencing. We walked through the halls of abandoned factories. We sat with industrialists who dared to dream. We dug into government programs that are barely spoken about. We spoke to visionaries shaping Nepal's future.

From the story of Gorakhkali Rubber Industry, now quiet but still full of possibility, to a deep dive into Mountain Tourism, a sleeping giant of opportunity, this magazine moves across the industrial map of Nepal.

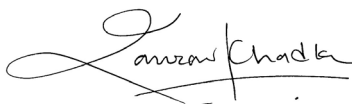
You'll read about large industries like Goldstar and Hulas; the challenges of public hospitals, the revival of Palpali Dhaka, and the policy gaps in agriculture. We even looked into how cricket might become Nepal's economic engine, and how a project like Jiri Lake can echo big ideas.

This magazine is the proud voice of our generation, daring to imagine a different Nepal. Every section be it manufacturing, agriculture, services, tourism, or health, it was handpicked and thoughtfully crafted to show just how broad and interconnected "industry" truly is.

To every reader who holds this magazine in their hands, this is yours. May it inspire you to think differently, act boldly, and contribute meaningfully to the future we are all responsible for.

Here's to the future we build together.

With all my heart,



Saurav Khadka

Editor-in-Chief, Industrial Vision – Volume 10
Secretary, SOIES Nepal
17th Executive Committee



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Why Rural Nepal Needs a Real Industrial Push

WHAT IS SWOT?

S STRENGTHS

Are internal factors that provide advantages or advantages for organizations or individuals in achieving their goals. Examples could be special skills, strong resources, or a good reputation.



W WEAKNESSES

Are internal factors that become obstacles or weaknesses for organizations or individuals in achieving their goals. This could be a lack of resources, limited expertise, or internal management issues.

O OPPORTUNITIES

Are external factors that can be utilized by organizations or individuals to achieve their goals. Examples could be new market developments, changes in industry trends, or partnership opportunities.



T THREATS

Are external factors that can hinder or threaten the success of an organization or individual. This could be intense competition, changes in government regulations, or changes in technology.



Can Gorakhkali Rise Again?



Gorakhkali Rubber Udhog Limited, once a cornerstone of Nepal's manufacturing sector, stands today as a quiet monument to unrealized industrial promise. Established on 2031/08/28 B.S. in Majhuwadeurali, Gorkha, the factory began commercial production in 2049 B.S., and was ultimately shut down on 2075/11/3 B.S. The story of this state-owned tyre manufacturing unit is not just about rubber, it is about Nepal's vision, capacity, mismanagement, and potential for revival.

The Rise

Developed in collaboration with the Chinese government, the factory brought skilled technical resources from China to train Nepali technicians, many of whom were from Thapathali Campus and ERC, Dharan. These young engineers, expected to take five years to be fully trained, mastered operations in just two years, particularly dominating the mechanical section.

Chinese employees were paid in U.S. dollars, and Chinese technicians supported initial operations, but Nepali technicians quickly gained full control of core manufacturing. The factory's tyres, built with bias-ply technology (using tubes), were ideal for Nepali terrain and soon earned high market trust. Gorakhkali tyres were preferred by truck, lorry, and minibus operators across the country, beating Indian tyres in quality.

Best in Quality

The plant followed stringent lab testing protocols. Only tyres that passed lab certification were released for sale. Even tyres affected by curing-phase power failures were debranded, categorized as arti tyres, and sold at discounted prices via local depots.

Far from being rejected, these tyres gained immense popularity as queues of trucks over a kilometer long were reported to buy these discounted but highly durable products. Notably, the factory operated with zero production waste and was seen as a model of industrial quality.

The Fall: Technical or Political?

Gorakhkali's collapse was not due to technical failure or natural disaster (despite the 2072 mega earthquake) but due to mismanagement, political interference, and poor governance.

Until the 2062/63 People's Movement, the factory was largely managed by Salt Trading Corporation, which ensured stable procurement and operations. After the political transition, the Government of Nepal assumed direct control and began appointing General Managers (GMs) along party lines, regardless of their experience or qualifications.

As governments changed between CPN-UML, Nepali Congress, and Maoists, each installed their own leadership. Raw material procurement fell apart. Educated Ministry secretaries from the Industry and Finance ministries became disillusioned working under politically appointed, less capable GMs.

The factory ran out of stock, employees showed up just to mark attendance, and trade unions turned workers into political protest participants. The situation snowballed into an operational collapse.

Hidden Agendas and International Interference?

Rumors of pressure from foreign tyre companies, especially Indian ones, to suppress Nepali competition also circulate among the locals, though no official evidence supports it.

What remains undeniably shocking is the current treatment of the factory site:

Foreigners (from India, Korea) are granted full machine access.

Nepali students, media, and technical observers are denied entry.

Foreigners wiping machines to read serial numbers and manufacturing countries raising suspicions of future asset sales.

Hope for Revival?

The government has considered:

1. Setting up a Radial Tyre Plant due to increasing demand (Estimated Cost: Rs. 2 Arba)
2. Operating under a Lease Model with private entrepreneurs
3. Seeking a Strategic Partner for technical upgrades and cost reduction
4. Welcoming foreign visits but controversially limiting Nepali access

There's still crores worth of finished goods and raw rubber stored inside. Machines remain in condition to operate if overhauled for 3–5 months. According to some employees, the plant could still run smoothly for the next 20 years with basic repair.

The factory occupies 665 ropanis, a massive strategic asset. It lies just 120–125 km from Kathmandu, close to Chitwan, India, and even China. Former employees are willing to return and train new recruits for 2–3 years, showcasing loyalty and unmatched experience.

What Remains?

Sadly, politics had the last say. After 2072, the government briefly attempted revival with Salt Trading's involvement. Raw materials were ordered. But a protest by a politically aligned trade union blocked the plan, and in 2075 Magh 3, the factory was officially shut.

Category	Details
Location	Majhuwadeurali, Gorkha
Ministry	Ministry of Industry, Commerce & Supplies

Component	Amount
Authorized Capital	Rs. 121.111 Crores
Paid-up Capital	Rs. 71.578 Crores
Govt. Share	Rs. 71.111 Crores
Govt. Ownership	58.63%

Detail	Number
Retired Permanent Employees (2075/10/2)	170
Current Contract Staff	7
Total Current Staff	7

Today, 50–60 monkeys roam freely where machines once ran. A facility once filled with energy and purpose now echoes only with rusting metal and broken dreams.

Gorakhkali Rubber Udhyog is not just a closed factory, it's a mirror of Nepal's industrial struggle. It had the people, the machines, the market but lacked the system. A system that could support sustainability, a system that could adapt to political change, and a system to prioritize long-term value over short-term power plays.

In the words of one former employee:

"We built something that worked... then we watched it fail not because of incompetence, but because no one could manage the success."

VOICES FROM THE VISIT

"Shoes, clothes, and files of employees were still lying there, untouched. It felt like a life interrupted as if the factory was shut down without warning."

- Aashish Bhandari

"Nearly 400 workers meant 400 households directly dependent on this industry. The handwritten safety posters still intact on the walls reflect a workplace that cared."

- Binaya Shrestha

"What struck me most was the emotional attachment locals and past employees still have for this factory. It wasn't just a job, it was family."

- Saurav Khadka

A yellow manual sprayer pump with a tank and hose, situated outdoors under a shelter, surrounded by lush green foliage.



Observation Details	
Observed Problem (What is wrong?)	→ The entire solution is a big problem that we have discussed with the option. Practically it requires some training, the entire industry is shut down.
Why do you think this problem exists? (Negligence, outdated system, poor design)	→ According to an audit one observation of the report option, the problem arose due to the huge control of the government and political pressure for solving the problem. Disruption of the local economies and solution is not straightforward. → This has largely affected the entire economy of the industry, leaving it shut down since last 4 years.
How does it affect productivity / operations / safety?	→ Yes, the solution is stringent and it's proper accountability.

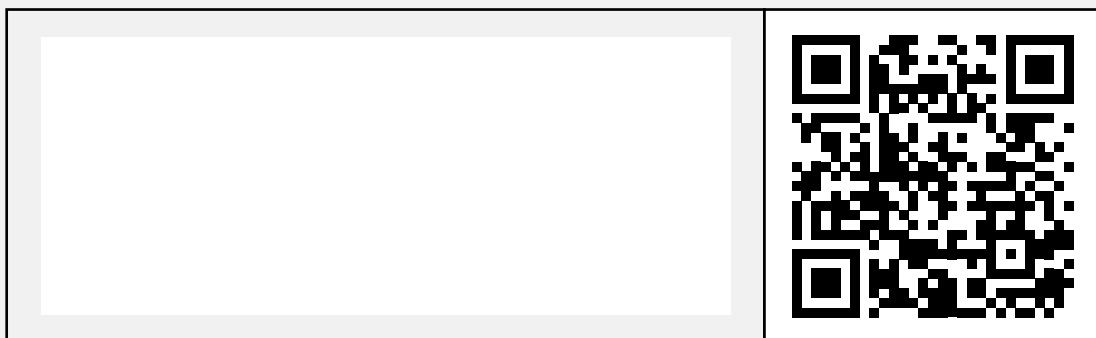
3. उद्योग बंद होना एक प्रकार का व्यवसाय के लिए

- **Risk in public limited format** (जो भी business में)
- **2005 A.S. per local कर उठाया** (संयोजन में)
- **5 year machine ration period**
- **2019 तक आसपास production** (कम होना प्रारंभ)
- **अच्छा काम करने** (काम को) (काम को) (काम को)
- **CME कर** (काम को) (काम को) (काम को)

3. उद्योग बंद होना एक प्रकार का व्यवसाय के लिए

- **अच्छा काम करने** (काम को) (काम को) (काम को)

4. हालांकि उद्योग बंद होना एक प्रकार का व्यवसाय के लिए



Your Signature

Qr Scan For vote

“If you are in support of Gorakhkali Rubber Industry Revival, Sign Here and Vote your support by scanning the QR.”



INTERVIEW WITH

Mr. SANDIP KHADKA

DIRECTOR OF HULAS STEEL INDUSTRIES LIMITED



For us, industry is not just about GDP but it's about Gross Domestic Impact. At Hulas Steel, we actively support the communities where we operate-uplifting rural youth through skills, jobs, and infrastructure.

1. Hulas Steel is known as Nepal's one the leading industry in steel roofing. Could you share how it all began and how it has transformed over the years?

The origin of Hulas Steel is more than just an industrial story : it is a story of social impact. In the late 1980s, our founder, Late Mr. Diwakar Golchha, was deeply moved by a tragic fire incident in a village near Biratnagar where several homes with thatched (paral) roofs were destroyed. That moment sparked the vision to introduce a fire-resistant, long-lasting roofing alternative to protect Nepali homes.

In 1989, using advanced Japanese technology, we established Hulas Steel as Nepal's first manufacturer of galvanized

and color-coated steel sheets. From that single product line, we've now diversified into a wide range of structural, architectural, and infrastructural solutions, including pipes, electric poles, crash barriers, aluminum profiles, Sky-lock roofing systems, suspension bridge components, and more.

Late Diwakar Golchha always believed that everyone in Nepal deserves employment opportunities within the country. By providing jobs to those who might otherwise go abroad, we can prevent brain drain and boost the nation's growth. This vision led to the creation of supportive laws and a thriving industrial empire, offering thousands of Nepalis meaningful employment.

2. Can you elaborate on Hulas Steel's Simara plant: its structure, technological process, and why this location has become a strategic industrial hub in Nepal?

Our Simara Industrial Plant, located in Bara district, is one of the largest and most sophisticated steel plants in Nepal. It's not just a production facility, we believe it's a symbol of industrial self-sufficiency. Spread over several acres, this plant houses advanced production lines for cold-rolling, galvanizing, galvalume coating, and color coating.

Why Simara?

Its location is a textbook example of industrial strategy to the Birgunj Inland Port, which is Nepal's gateway to international trade, especially with India. This proximity allows seamless import of raw materials (like hot-rolled coils from Japan, Korea, and India) and efficient export of finished products to neighboring countries.

Talking about the production process, in a very simple way: the process begins with pickling, removing surface impurities, followed by cold-rolling to refine the steel, then galvanizing or galvalume coating for corrosion resistance. We then color coat and profile them into Steel (Jasta), CR sheets, poles, pipes, and more. Each product undergoes stringent quality control in our modern lab.

3. In an industry where innovation defines survival, how does Hulas Steel foster a culture of continuous improvement and product evolution?

Innovation is not optional, it's the only way forward in a volatile and competitive industrial world. At Hulas Steel, we have made innovation a core part of our DNA. From adopting galvalume and color coating technology to creating eco-friendly roofing solutions, we constantly evolve. We were one of the first in Nepal to introduce color-coated roofing sheets, a move that wasn't just about aesthetics but about durability, heat resistance, and sustainability. We are also pioneering smart steel structures that are lighter, more earthquake-resilient, and environmentally safer. Our focus now is on digitizing industrial systems, implementing ERP solutions, and exploring smart manufacturing with IoT and AI integration. We believe in preparing for tomorrow.

4. What is the role of Hulas Steel in uplifting society, particularly in rural areas? What social missions does it pursue beyond business?

For us, industry is not just about GDP but it's about Gross Domestic Impact. At Hulas Steel, we actively support the communities where we operate. In Simara, for instance, most of our employees come from nearby villages, and many are first-generation industrial workers. We've also partnered with local governments and NGOs to build infrastructure in remote schools, health centers, and vocational training institutes. Our aim is to empower people to uplift their own communities. One of our current programs trains rural youth in industrial welding, machining, and steel structure building, skills that are globally in demand.

We strongly believe that corporate success is incomplete without social inclusion. That's why our CSR isn't just a compliance metric it's a part of our daily operations.

5. Nepal faces economic instability, political fluctuations, and inconsistent industrial policy. How does Hulas Steel adapt, and what can startups learn from the journey?

Adaptability is the foundation of sustainability. Nepal's economic and political environment is undeniably challenging. At Hulas Steel, we've built resilience through diversification, strategic foresight, and systems thinking. We maintain buffer stocks, have multi-source procurement strategies, and design flexible production schedules to handle import bottlenecks or policy shifts. We are also increasingly investing in R&D and policy-level engagement, working with government bodies to improve industrial frameworks.

Startups need to understand that growth in Nepal comes not just from innovation but from patience, planning, and policy literacy. I always say Don't just build a product. Build a system around that product that can survive uncertainty.

6. Hulas Steel is involved in several major national infrastructure projects. Could you elaborate on your company's collaborations with municipalities, other institutions?

Yes, we've had the honor to contribute to several national and municipal-level infrastructure projects. From supplying poles for the Nepal Electricity Authority (NEA) to providing steel structures for schools, bridges, and municipality buildings, we believe industries must directly support the nation's development goals.

We work closely with local municipalities to promote earthquake-resistant housing, particularly in disaster-prone zones. Our CSR engineers and product development team often consult with local planners to create customized roofing or structural systems suitable for their topography and weather conditions.

7. Nepal has huge potential for exports. What is Hulas Steel's role in this, and how do you envision Nepal's position in the regional steel market?

Absolutely, export is not just an economic opportunity; it is a national responsibility. Hulas Steel currently exports to parts of India and Bhutan. However, we see a much larger future

Our Simara location gives us a trade advantage via Birgunj ICD and rail connectivity. In the long run, Nepal should position itself as a lightweight, high-strength steel producer for regional infrastructure projects. We are actively exploring design-led steel exports not just raw sheets, but finished structures for prefab houses, sheds, rural infrastructure, etc.

We need better branding, better logistics, and better diplomatic-industrial coordination. But the potential is massive.

8. What is Hulas Steel's long-term vision, particularly in terms of innovation, sustainability, and global standards?

Our long-term vision is to transform Hulas Steel from a manufacturing unit into an industrial innovation leader. We are already incorporating green manufacturing (Golchha Green), aiming for solar-powered processing, zero discharge systems, and modular production units.

We are also committed to making steel accessible, aesthetic, and affordable. Our R&D unit is working on climate-adaptive roofing systems, sky locking profiles,

To support this vision, we are setting up a Centre for Steel Innovation & Design (CSID) in partnership with international advisors. Because innovation must never stop and we want to be Nepal's industrial thought leader.

9. How does Hulas Steel preserve and promote traditional Nepali architecture and lifestyle through its modern products?

One of our proudest initiatives is blending modern steel technology with traditional Nepali aesthetics. For example, our color-coated sheets are now available in tiles and wooden textures, specifically designed to replicate traditional roof tiles of places like Bhaktapur, Patan Dharan, and Nepalgunj. We are also on the verge of collaborate with local municipalities to standardize roofing solutions for heritage towns so that modernization doesn't erase identity.

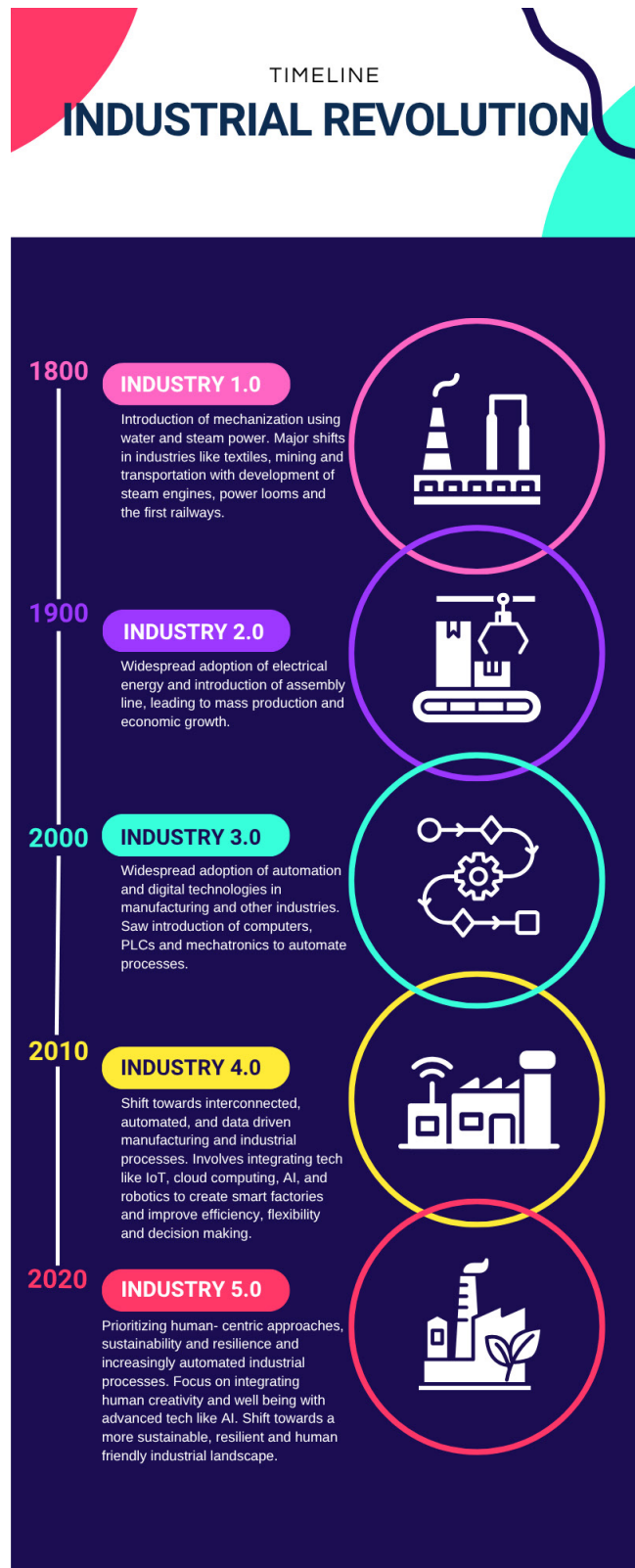
In rural Nepal, especially in Karnali and Sudurpaschim, we've introduced modular roofing systems that mimic the sloped, stone-roof styles but with lightweight and climate-proof steel. We're also exploring Nepal-style prefab homes for disaster zones that can be constructed in days but reflect local design. This isn't just business, it's cultural preservation through technology.

10. What message would you like to give to aspiring industrial engineers and entrepreneurs in Nepal who want to lead the nation's industrial future?

Nepal is not waiting for miracles, it's waiting for you with your ideas, your energy, and your determination.

If you're an engineer, expand your mindset beyond machines and tools. Understand markets, people, policies, and sustainability. Become a designer of systems, not just processes.

If you're an entrepreneur, create businesses that address Nepal's pressing challenges including waste, transport, housing, and rural growth.



KAIZEN: Continuous Improvement

A Sustainable Way to Revive Industry



In a world where everything is becoming increasingly fast-paced, many people forget the importance of longevity and quality. The quicker the product is prepared, the quicker it breaks, and the faster the stock can be sold, the better it is viewed today in terms of business. This is because more sales are being made, which should be a good thing, Right?

While on paper profit overshadows the many treacherous impacts that over-consumption has brought to our planet, the reality of the world still

heading towards exhausting resources beyond our needs never fails to creep in, with the effects of global warming visible all around us.

Where does Kaizen come into all this? Before that, let's discuss the societal expectations and values of the country Japan when it comes to craftsmanship and quality.

Stationery, it's something everyone uses or has used in their life. Stationery is a crucial part of any human's existence, simply with how much humans have begun to rely on recording, writing,

and sharing scriptures and art to express themselves. Today, Japan is recognized as a place with the world's most innovative and quality stationery items, which companies manufacturing it take deep pride in. From erasers that are transparent to allow view of what you're erasing or shaped in a particular way to allow the users a clean erasing experience from sharp edges, pens that glide to the paper like butter while being ergonomically designed just for the human hand, to paper and notebooks that account for smallest of problems such as smudges and texture, Japan truly always finds new ways to improve in terms of what their product has to offer.

There, the companies don't simply make a product and call it a day; they are constantly striving to improve it, in quality, in terms of ease of use, and to meet customer needs through trial, error, and feedback. Because the Japanese market comes from a cutthroat competition where the companies keep trying to one-up each other, not simply through

high sales, that's just a byproduct, but by making products of such high quality and features.

This isn't simply limited to the stationery industry; Japan's priority towards quality extends to many other industries such as cosmetics, handmade products, and automobiles. One of the key examples of this would be the world-renowned brand of Toyota.



Kaizen isn't about perfection; it's about progress. Small, daily improvements create lasting change, turning ordinary industries into legends of quality.

The importance of priority started after an American Quality Management Expert, W. Edwards Deming, came to Japan post-World War II



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to aid in the rebuilding of the country and managed to revolutionize Japan's Industry standards for quality and improvement. And in a country where people put much pride in their hard work, learning, and values, Deming's teachings are still prominently seen in the companies today.

So, how does continuous improvement help any industry revive itself? The key lies in the capacity of customer retention.

Take a simple example from Nepal. In every town, there is always a shop where the people gather to drink tea every morning. Now, if the shop were to serve customers with a product that does not meet their standards, the only reason they would retain consumers would be one-time visitors. And you can only have so many new people visiting if the town is small. But imagine if you prepared a product of high quality and standard that kept attracting repeat clients, the likelihood of your customers returning again and again provides far more value and job security than finding new ways to attract consumers who would walk away and not come back again.

And to add to that, a satisfied customer would also most likely, through word of mouth, spread the existence and help promote your products to other new customers. This way, if any new competition arrives, people are also most likely to stick with the business they have always been using out of loyalty to the product. This shows that the retention of customers plays a vital role in helping businesses succeed in the long run.

Many factories in Nepal suffer because they are not able to give and keep



customer retention after their initial launches and build that personal connection. And in time, instead of trying to improve, the quality slowly downgrades itself, causing the loss of even the remaining ones who go in search of other products. Another thing that is quite prevalent in Nepal is the fact that businesses, once they have entered the comfort zone of a break-even point, don't really find a reason to expand or improve. "If it's not broken, don't fix it." Mindset is holding back a lot of industries from reaching their full potential because risk is not considered a factor worth taking.

So, what is Kaizen? It's a Japanese principle adopted by manufacturing companies, particularly Toyota, that helped develop the "Toyota Production System," which is also known as "Lean Manufacturing." Lean Manufacturing refers to a production philosophy focused on minimizing waste and maximizing value for customers. Later, this concept was popularized globally through the success of the book written by Massaki Imai called "Kaizen: The Key to Japan's Competitive Success." And true to his words, he also founded Kaizen Institute, a global consulting firm that worked to aid in implementing Kaizen principles.

Changes take time to implement, but together, if everyone tries, it is not quite as impossible. Having a change of mindset comes with more learning as we grow, after all. Just like the definitions we learn, they change as we get older. It's like how force changes from "Push and pull upon an object caused by its interaction with other

objects" changes to "any actions that change or tend to change the state of motion or shape of an object" as we get to engineering. Nothing comes without learning, and this includes the art of learning itself.

One stick may be easy to break, but if we were to work together, it would be quite difficult to break everyone. If the industries were to involve their employees in finding proper problems and brainstorming solutions, giving them a voice and power to cause a change and rewarding them for it to boost their morale, and through small changes decreasing waste and increasing productivity, there is no telling how these small actions would lead to big changes. And it all starts with one thing: the will to change, to adapt, to learn, and to value just one concept in particular towards a brighter future. So, what do you say? Is it worth a shot? Why don't we start today? Make sure to remember!

Kaizen!! Let's head towards continuous improvement.



ELIAS (Explain Like I'm Actually Five)

Imagine that you made a toy. It breaks immediately. You make a lot of toys. The customers buy them, but they don't last. Not nice, is it?

Now, consider a toy that just doesn't break. People love it and recommend it to their friends. They come back for more! Even better!

People in Japan try to make things better each day. Even a tiny difference, like a better lead in pencils or a smoother notebook, matters a lot. This whole concept is termed Kaizen, the constant effort at stepwise improvement.

If we do the same thing in Nepal, it can give a lift to our shops, factories, and methods; we can make great things there as well. When everybody is trying to improve together, only big changes can come in.

So, the essence of it is:

Keep fixing small things, keep learning, and keep improving.

That is Kaizen!

भ्याट नं. ६१००४२०१२

दर्ता नं. २६६५२३/०७८/०७९



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शाखा कार्यालयहरू

सन्धिखर्क-१, हललाईन, अर्घाखाँची,

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कावासोती-८, हलचोक, नवलपरासी, (ब.सु.पू)

फोन नं. ०७८-५८०२००, ८७६२५६२४०२, ८८५५०६४५७४



उपलब्ध सेवाहरू:

निर्माण सामग्रीहरू (छड, सिमेन्ट, गिट्टी, बालुवा, विटुमिन आदी) को गुणस्तर परिक्षण, गुणस्तरिय प्राविधिक परामर्श, सिपमूलक तालिमहरू



GoldStar®
Shoes

Interview with
**VIDUSHI
RANA**

Executive Director
Director Marketing and
Branding, GoldStar Shoes
Honorary Consul of Iceland



There is a reason why you're born where you're born. Doing the best possible for your country is your duty, it is your karma

1. You joined Goldstar around 2017-18. Earlier, you worked as a Marketing and Brand Manager at Kumari Bank. Transitioning from the banking (service) sector to core manufacturing, what key differences did you notice?

Marketing is about letting people know what facilities you can provide for them. It is usually the same concept whether it is in the banking sector or production sector. Branding and marketing were not a well-known concept back then but eventually everybody recognized the importance of letting people know about the product. When I joined Goldstar, the concept of branding and marketing was new as well since the shoes were being sold and were doing good, but we did campaigns for the brand and brought it to a new level.

2. Goldstar's transformation from a humble Hatthichhap brand to a youth-favorite fashion brand is remarkable. What were your first major steps toward this rebranding?

Hatthichhap was founded by my father-in-law, Mr. Noor Pratap Rana and it was doing well but eventually me and husband, Mr. Amir Pratap JB Rana, decided to make shoes that would suit the youth population too. We had to bring new materials and new machinery for the new version that we were envisioning and ensure that it was well marketed to reach the targeted customers, so we had to invest much

in that as well. Our shoes could only be found in places like Asan, Indrachowk and that's why we opened franchise stores of Goldstar so that people would know where to find them and now there are about 70-80 franchise stores of Goldstar all over Nepal.

3. What has caused Kiran Shoes to maintain such a constant stream of quality and brand value for such a long period?

The best thing that we as a company opt for is progression. Even when our shoes were doing well for adults, we planned to reach a new set of customers, the youths. Our stores were not very accessible, so we opened new franchise stores to increase reach without compromising the quality. And now we are available in the international market too, so progression is what has been maintaining quality and brand value of Kiran Shoes.

4. Despite Goldstar's success, we see very few large-scale domestic manufacturing brands in Nepal. Why do you think industrial scale-up is so rare here?

It feels very disheartening to say that only 5% GDP of our country is covered by manufacturing. People work hard in a foreign country and send money to their families but the money they are sending also gets exchanged with the goods that are imported from foreign lands and the money

that they gets in our country also slips away and makes us harder to compete with the traded goods. The reason why not many people are invested in shoes production is due to the investment requirement for the raw material collection, the labor cost involved and competition with the imported goods. To enhance production, government support is also required but since a lot of people are involved in making fake brands on their own and dodging taxes, they are also looting the government in a way. Due to these practices brands like Goldstar still must face hurdles that are affecting their upscale.

5. Many emerging Nepali brands import products from China or India and rebrand them locally. Do you think this trend is hurting domestic manufacturing potential?

Yes, it is hurting the domestic manufacturing potential at a level. But faking the brands that are made in Nepal by people at their places is what's creating bigger problems. It's not that the government does not play any role in solving the issue. The government keeps increasing the taxes and implementing new policies, but those people still find new ways to dodge the policies.

To solve these problems, the government should make even stronger policies such as providing bills a must to the customers and having KPIs so that those creating fake brands materials and avoiding taxes do not get a market for them to sell.

6. As a leader in one of Nepal's most recognized manufacturing companies, what do you think are the top 3 policy or ecosystem changes needed to truly 'revive' Nepal's industry?

First and foremost, government should welcome with flooring a red carpet for manufacturing sector as it is the backbone for any nation. Other than that, the government could also decrease custom duty on raw materials needed for production as that would keep us motivated. The interest rate in banking is the same for manufacturing companies as well as for the traders, government could also give emphasis on decreasing the interest rates for better feasibility for manufacturers. Also giving some extra discount on facilities such as electricity, VAT or anything would encourage those involved in the manufacturing business. The biggest support that could be provided by the government, especially for the footwear industry, would be by addressing the problem of plagiarism and tax avoidance by the unauthorized groups.

7. With more than 3,000 employees and a majority being women, how do you view your role in empowering women through industrial employment?

There are so many women who seek for job opportunities but initially do not have the required skills. We provide them with training to get employment in our company. It's not just about the job but it is the sense of security that they feel when they receive their hard-earned money and that is also something that helps in empowering them.

8. Goldstar has over 3,000 employees, many of whom are women. Congratulations on successfully turning the idea of women empowerment into meaningful action. In one of your interviews, you mentioned that although youths in Nepal are being trained, many don't stay long in the industry, and the rate of going abroad remains high. How do you view this trend of youths seeking opportunities outside the country?

It is so disheartening that the majority of youths plan on going abroad to work but they don't realize that it is even harder in a place where you don't have your people. It's not that there is no opportunity in Nepal since there are problem and you could be the one providing solutions. I would not say don't go to foreign countries, yes you should explore and learn from the best when you get the opportunity but after you acquire them, you should serve your nation. There is a reason why you're born where you're born. Doing the best possible for your country is your duty, it is your karma.

9. Do you currently collaborate with universities or offer internship opportunities for engineering or management students? Would you be open to building those bridges?

We have about 30-35 engineers here in Goldstar and yes, we would be very happy to collaborate with universities so that their students could work as an intern or full-time engineer in our company. We could probably do a MOU with the affiliated universities so that there is a fine bridge between us and the students. Why don't we do one?

10. Finally, what message would you like to share with young industrial engineers and mind entrepreneurs trying to build Nepal's next Goldstar?

I would say since Nepal is a country with a lot of opportunistic gaps in various sectors. It leaves room for us to fill them, and I would like to congratulate you all for choosing to stay in Nepal and those who are willing to stay here and start a business. As Nepal is also progressing steadily, reality shows like shark tank Nepal are available making mentorship and investment more feasible for startups with good plan and vision. So, again I would like to repeat "There is a reason why you're born where you're born. Doing the best possible for your country is your duty, it is your karma". And congratulations on your Industrial Vision.

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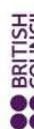
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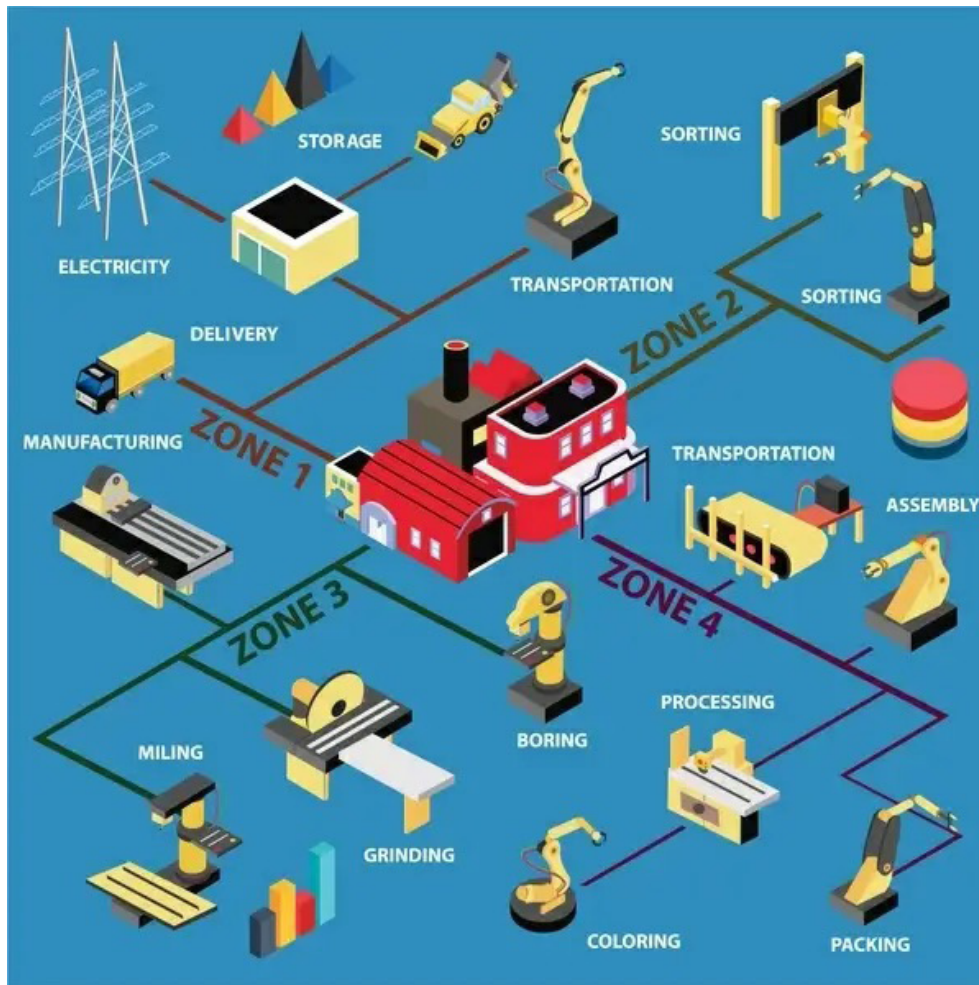
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From Traditional to Smart

Transitioning to Industry 4.0 in Nepalese Manufacturing



face severe decline. Pashmina exports plummeted 30% between 2015 and 2022 due to quality inconsistencies and competition from synthetic alternatives. Most weaving units still use manual looms, unable to scale production or ensure standardization. Cement production relies on outdated kiln technologies, consuming 25-30% more energy than modern plants. Food processing suffers from inconsistent hygiene standards and post harvest losses exceeding 40% in perishable goods due to inadequate cold chain infrastructure. With over 1.2 million workers engaged in these sectors, low productivity perpetuates economic stagnation. Without technological intervention, Nepal risks permanent marginalization in global supply chains.

Imperatives for Change

Three converging forces necessitate urgent modernization:

1. Technological Imperatives:

IoT enabled sensors can predict equipment failures before breakdowns occur, reducing downtime by up to 45%. AI driven quality control systems detect defects with 99% accuracy compared to human inspection's 85% benchmark. These technologies are no longer optional for cost competitive manufacturing.

2. Global Market Pressures:

International buyers increasingly demand digital traceability and sustainable practices. Bangladesh's garment sector captured 8% additional EU market share by implementing RFID based supply chain tracking. Nepal's paper based documentation systems cannot compete.

Introduction

Nepal stands at a critical juncture in its industrial evolution. As global manufacturing accelerates toward automation and interconnected systems, Nepal's reliance on traditional methods threatens its economic competitiveness. Industry 4.0, the integration of IoT, AI, and data analytics into production offers transformative potential for productivity and sustainability (Thames & Schaefer, 2016). Yet significant barriers persist, including technological gaps, infrastructure limitations,

and workforce skill shortages. While emerging applications in energy management demonstrate promise, systemic adoption remains elusive. This article examines Nepal's readiness for this transition, identifying actionable pathways for modernization.

Current State of Manufacturing

Manufacturing contributes merely 5.3% to Nepal's GDP, reflecting deep seated structural challenges. The sector remains dominated by labor intensive processes across key industries: Textiles, once a pride of Nepalese craftsmanship,



Industry 4.0 is not a luxury but a necessity for Nepal's industrial future. Without technological intervention, Nepal risks permanent marginalization in global supply chains.



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3. Policy Enablers:

The Digital Nepal Framework provides scaffolding for transformation. When coupled with targeted incentives, tax holidays for automation imports, subsidized loans for SMEs policy can catalyze sector wide adoption (Rajbhandari et al., 2022).

Challenges and Opportunities

Persistent Obstacles

Financial constraints top the list: Retrofitting a single cement kiln with IoT sensors costs approximately NPR 2 million, prohibitive for most SMEs. Technical skills gaps compound this; fewer than 30% of engineering graduates possess practical AI or data analytics training (Devkota et al., 2021). Infrastructure deficiencies, particularly unstable grid power and limited 4G -coverage in industrial zones, disrupt digital operations.

Sector Specific Opportunities

Cement: Predictive maintenance systems could reduce energy costs by 18-22% in plants like Agni and Shivam, directly addressing Nepal's power shortages.

Garments: Blockchain integrated supply chains would provide ethical sourcing verification demanded by European retailers, potentially increasing export margins by 15%.

Food Processing: Computer vision systems for quality sorting, costing under NPR 700,000 per line, can cut post production waste by 30% in dairy and fruit processing.

Strategies for Implementation

1. Phased Technology Pilots

Launch sector specific demonstrations: Implement vibration sensors on crushers at Himal Cement, or AI defect detection at Morang Textiles. Documenting 20-25% productivity gains from these controlled experiments builds stakeholder confidence. The National Planning Commission should co-fund 10 high impact pilot projects by 2025.

2. Workforce Transformation

Redesign technical education: Introduce Industry 4.0 certification programs at CTEVT focusing on IoT maintenance, data literacy, and automation operation. Forge apprenticeship partnerships with Bangladeshi tech hubs, replicating their success in upskilling 5,000 workers within 24 months (Ahmed & Opoku, 2022). Micro credentialing for existing workers can bridge immediate skill gaps.

3. Cost Effective Retrofitting

- Prioritize affordable augmentation over equipment replacement:
- Install modular NPR 50,000 80,000 IoT kits on legacy machinery
- Implement cloud based analytics instead of expensive server infrastructure
- Use open source AI tools for quality inspection
- Studies confirm such approaches yield 20-30% efficiency gains without major capital outlay.

Policy Acceleration

- Immediate government actions should include:
- Five year tax exemptions for Industry 4.0 technology imports
- Establishment of a NPR 500 million SME technology fund through Nepal Rastra Bank
- Regulatory mandates for 5G deployment along industrial corridors by 2026
- Cybersecurity standards for industrial IoT devices (Ministry of Industry, 2022)

Conclusion

Nepal's manufacturing crossroads demands decisive action. The transition to Industry 4.0 is not about displacing human labor but augmenting it with intelligent technologies. By strategically prioritizing pilot projects, workforce development, and policy reforms, Nepal can transform its manufacturing base into a competitive, sustainable engine of growth. A technician in Hetauda monitoring sensor data, a craftsman in Patan using digital design tools, or a food processor in Chitwan optimizing cold chains, are faces of Nepal's industrial future. Delaying this transition risks irreversible economic marginalization. The tools for transformation are available; what's needed now is concerted action from industry, academia, and government to turn potential into prosperity.

punktum



Industry 1.0

Mechanization and the introduction of steam and water power



Industry 2.0

Mass production assembly lines using electrical power



Industry 3.0

Automated production, computers, IT-systems and robotics



Industry 4.0

The smart factory, autonomous systems, IoT and machine learning

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8 WASTES OF LEAN MANUFACTURING



Defects



Cause: rework, scrap and incorrect information the first time

OverProduction



Cause: more production than needed or before it is needed

Waiting



Cause: people have to wait to start the next step in a process

Non- Utilized Talent



Cause: underusing teamates' talent, skills and knowledge

Transportation



Cause: unnecessary movement of products, machines and materials within a process

Inventory



Cause: excess materials and products not being processed

Motion



Cause: unnecessary movements by people within a process

Extre- Processing



Cause: doing more work or higher quality work than your customer requires

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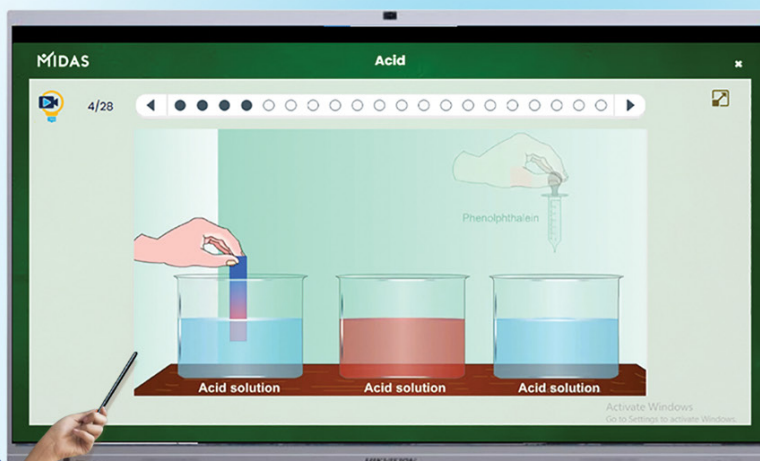
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When Roads Fail, So Do Industries

As someone studying development and closely observing Nepal's evolving industrial landscape, one issue continues to haunt my understanding of growth: our roadways. No matter how promising a business plan may seem or how motivated our youth are to contribute to local production, the harsh reality is that our industries are stuck, quite literally, in traffic. In this article, I explore the often overlooked but deeply rooted impact of poor transportation and road infrastructure on Nepal's struggling industrial sector.

A Promise Undelivered

Nepal's geography has always been a challenge but with modern technology and investment, that shouldn't be an excuse anymore. Still, decades after we began talking about "industrial development" and "economic growth," the foundational need i.e. efficient transportation

remains unmet.

Roads are not just physical connectors; they are the lifelines of industry. They determine whether raw materials arrive on time, whether goods make it to market while still fresh and whether investors believe in the long-term sustainability of a business. But when a single rainfall can cut off entire districts or turn highways into rivers of mud, the impact is more than just inconvenient; it is economic sabotage.

Industries Losing Momentum

Take Bhairahawa, for instance, a region rich in industrial activity and located near the Indian border. The city houses the Lumbini Industrial Corridor, home to several manufacturing plants and factories. Yet during the monsoon, the roads connecting Bhairahawa to the East-West Highway become nearly impassable. Trucks carrying raw

materials or finished goods often remain stranded for hours, if not days. This has a direct cost; perishable goods are ruined, delivery deadlines are missed, and international buyers lose trust.

In one interview conducted by The Kathmandu Post (2023), a local garment manufacturer shared how delays in transporting goods to the customs point resulted in canceled export orders. "What hurts most is not just the loss," he said, "but knowing that it could have been avoided if the roads were just... usable."

A National Issue, Not Just Local

This is not just Bhairahawa's story. Across the country, from the Terai to the hill regions, poor transportation networks are deterring industrial investment. The Narayanghat-Mugling road section, an essential part of the Prithvi Highway, is constantly plagued by landslides, narrow lanes, and incomplete expansion works. A report by the National Planning Commission (NPC, 2021) noted that transportation-related delays contributed to nearly 20% increased logistic costs for manufacturing companies in central Nepal. According to the World Bank (2020), transporting cargo from Birgunj to Kathmandu can take longer than from Kolkata to Birgunj because of severe congestion and poor road conditions. For a landlocked country that relies on efficient trade logistics, this is an alarming statistic.



But when a single rainfall can cut off entire districts or turn highways into rivers of mud, the impact is more than just inconvenience; it is economic sabotage.



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Why This Matters: A Youth Perspective

From a personal standpoint, this inefficiency deeply concerns me, not just as a student of development studies but also as a young Nepali who hopes to see local industries flourish and youth employment rise. We often talk about youth migration, unemployment, and brain drain. But what are we offering our youth here at home? When small enterprises struggle just to transport their goods within the country, how can we expect large-scale job creation or innovation?

Disinterest in Industrial Investment

It’s not surprising that such conditions lead to demotivation. Industrialists, both local and foreign, are losing confidence in Nepal’s infrastructure commitments. When a single landslide can cut off trade routes and when highway expansion projects remain incomplete for years due to poor governance, why would any investor feel secure? The World Bank’s “Nepal Road Sector Assessment” (2022) highlighted this very issue. It stated that Nepal loses nearly 8-10% of its GDP annually due to inadequate transport and logistical infrastructure. For a country like ours, that is a massive setback.

Nepal stands at a crossroads, quite literally. On one hand, we have an industrious youth population, growing local entrepreneurship and increasing demand for Nepali products. On the other hand, we have broken roads and broken systems pulling everything backward. The link between transportation and industry is not a luxury to consider later, it is the foundation of progress. Until our roadways become reliable, our industries will remain vulnerable. We must stop seeing infrastructure as mere construction and start seeing it as a connection: to markets, to growth, and ultimately, to hope.

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DELAYED ROAD PROJECTS IN NEPAL

Project	Start Date	Original End Date	Revised End Date	Progress / Delay
Kaligandaki Corridor (NH48)	Dec 3, 2018	Dec 2021	—	Multi-year delay
Koshi Highway (NH08)	ongoing	Jan 27 2025	2021 (full open)	Operational components incomplete
Kathmandu–Terai Expressway (NH33 ”)	Oct 2019	Sep 2021	Apr 2027	>41% delay: >6-year delay
Mugling–Pokhara –NH26)/(Prithvi) widening	Jan–Apr 2021	2024	Feb–Nov 2025	Only > 8.1 % Progress, delay
Kanchanpur–Kamala Section	Mid 2020	Late 2023	Dec 2024?	>50% complete:
Kakarbhittha–Laukahi (East–West)	Early 2024	—	2033	> 4.5 % only: serious delay
Bheri Corridor - Dunai–Lyaseekyap	2019–22	2024/25	2024/25	Only >13 % Progress

NATIONAL PRIDE PROJECTS OF NEPAL

	Project Name	Category	District	Province
1	Babai Irrigation Project	Irrigation	Bardiya	Lumbini
2	Bheri Babai Diversion Multipurpose Project	Irrigation/Hydro	Surkhet	Karnali
3	Mahakali Irrigation Project	Irrigation	Kanchanpur	Sudurpaschim
4	Rani Jamara Kulariya Irrigation Project	Irrigation	Kailali	Sudurpaschim
5	Sikta Irrigation Project	Irrigation	Banke	Lumbini
6	Sunkoshi Marin Diversion Project	Irrigation/Hydro	Sindhuli	Bagmati
7	Budhigandaki Hydroelectric Project	Hydroelectric	Gorkha/Dhading	Gandaki/Bagmati
8	Upper Tamakoshi Hydroelectric Project	Hydroelectric	Dolakha	Bagmati
9	West Seti Hydropower Project	Hydroelectric	Doti	Sudurpaschim
10	Gautam Buddha International Airport	Airport	Rupandehi	Lumbini
11	Pokhara International Airport	Airport	Kaski	Gandaki
12	Nijgadh International Airport	Airport	Bara	Madhesh
13	Pashupati Area Development Project	Tourism	Kathmandu	Bagmati
14	Lumbini Area Development Project	Tourism	Rupandehi	Lumbini
15	Mid-Hills Pushpalal Highway	Transport	Multiple Districts	All Provinces
16	Terai Hulaki Marg	Transport	Terai Belt	Multiple
17	North-South Koshi Corridor	Transport	East Nepal	Koshi
18	North-South Kaligandaki Corridor	Transport	Central Nepal	Gandaki
19	North-South Karnali Corridor	Transport	Western Nepal	Karnali
20	Kathmandu-Terai Expressway	Transport	Kathmandu-Bara	Bagmati/Madhesh
21	East-West Railway	Transport	Terai Region	Multiple
22	Gautam Buddha International Cricket Stadium	Sports	Chitwan	Bagmati
23	Mulpani Cricket Stadium	Sports	Kathmandu	Bagmati
24	Girija Prasad Koirala Cricket Stadium	Sports	Morang	Koshi
25	Melamchi Water Supply Project	Water Supply	Sindhupalchowk	Bagmati
26	President Chure-Terai Madhesh Conservation	Conservation	Terai Belt	Multiple

ENERGY CRISIS

Causes of Energy Crisis





The Policy Paradox: Why Nepali Farmers Only Grow, But Don't Grow with It

The Broken Chain: Who Really Earns?

Somewhere in Dolakha, a farmer wakes up in the morning to tend to his fields. By the time the potatoes are harvested, packed, and sent down to Kathmandu, they pass through two or three middlemen. Days later, those same potatoes sit on a supermarket shelf, sold at triple the price. The customer complains about the rising cost. The farmer counts his losses. But the one who neither grows the crop nor eats it earns the most from it.

This is the broken chain that defines Nepal's agricultural economy.

Farmers are not always the first sellers of what they grow. Caught in a system dominated by brokers and unregulated markets, they are forced to accept whatever price is offered. Meanwhile, consumers in cities continue to pay high for the same goods. We

cannot just blame it as a market failure, in fact it is a policy failure.

A well-functioning agricultural economy should connect the producer and consumer through a fair, traceable, and efficient system. But in Nepal, the chain is opaque, fragmented, and often exploited. Policies may exist, but enforcement is thin. As a result, the very people who feed the nation remain exploited by the system.

Ask any farmer in Dhading, Kavre, or Dolakha:

"Tapai le bechne mulya kati ho?"

Most will smile awkwardly not because they earned enough, but because they didn't get to decide the price at all.

In most haat bazaars, the price is already fixed before the farmer even arrives. The "sau" or broker tells them, "Yo bhanda badi ma ta bikri hudaina," and the



From field to market, Nepal's farmers lose at every step. It's time to break the broker monopoly with traceable barcodes, GI tags, direct sales, fair pricing, and policies that put power back in the hands of those who till the soil.

farmer who has already paid for fertilizer, seeds, and transport is forced to agree. The same potato that sells for Rs. 18 per kilo in the village reaches Rs. 45 in the capital. But the margin doesn't go to the grower, it goes to those who never set foot in the field.

It's not just about one crop. Whether it's mude ko aalu, sindhuli ko junar, jumla ko swau or charikot ko saag, the same pattern repeats. The farmer is always the last to profit, even though he's the first to sow.

This is where policy fails the people. Yes, there are agricultural offices, and yes, there are agricultural relief programs but who controls the market? Who assures the floor price? Who monitors whether the produce being sold under a famous name even came from that place at all?

In absence of enforcement, middlemen fill the gap, building wealth while the farmer's fate stays weather dependent.

Branding Crisis: Fake

Labels, Real Loss

Walk into any urban grocery store and you'll see signs like:

"Mude ko Aalu"

"Sindhuli ko Junar"

"Jumla ko syau"

"Charikot ko Saag"

But ask the shopkeeper where they really came from and you might hear: "Patan bata aako ho, tara taste ta eutai ho ni dai!"

This is the branding crisis in Nepali agriculture.

As per an article published in The Kathmandu Post (April 2017), farmers in Sindhupalchok were selling cauliflower for Rs 60/kg, while consumers were paying up to Rs 135/kg just 20 kilometers away.



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Similarly in Parbat, bad roads and a broker-dominated market meant farmers received Rs 60/kg, while the same goods sold for Rs 100/kg in nearby towns (Kathmandu Post, 2019). Even in Pokhara, where a farmer-run market tried to cut out brokers, the city municipality confirmed that farmers could earn Rs 70/kg for tomatoes 30% more than traditional markets (Kathmandu Post, 2019).

With real cases, they reflect a systemic failure in how farmers are connected to markets. The price gap isn't based on value but is based on access and power. In the absence of transparent price control, middlemen dominate the pricing structure, often without regulation or accountability. According to Kantipur Daily, over 64% of the consumer price in vegetables is eaten up by intermediaries, leaving farmers with barely one-third of what the final buyer pays.

We romanticize local names, but rarely ensure the product comes from that place. Mude ko aalu might be from Kavre, Junar from Bara, and swau tagged from Jumla may not have seen Karnali at all.

True regional branding adds premium value, identity, and respect to both the product and the place it came from. Without policy-level recognition like Geographic Indication (GI) tags, local produce is reduced to just another label anyone can print. Meanwhile, genuine farmers lose out on the higher market value, and the consumer unknowingly buys something that doesn't match the name.

Imagine if Mude ko Aalu came with a certified seal traceable back to a farm in Mude. Or if Sindhuli ko Junar was only allowed to carry that name when grown in Sindhuli.

Farmers in those regions would earn more per kilo, building pride in their heritage.

Consumers would have trust and transparency.

Youth might even return to farming. There's no issue with our crops, the soil is rich, the quality is high, and the taste speaks for itself. What we lack is policy that protects and promotes what is already excellent.

Until then, we'll keep selling "Mude ko aalu" from Bhaktapur and wonder why farmers in Dolakha are still struggling.

What Good Policy Should Look Like

Nepali farmers don't lack skill. They lack systems that protect their effort and reward their excellence. If we truly want to support agriculture not through sympathy, but through structure then policy must be bold, local, and transparent.

Here's what good agricultural policy should include:

Barcode-Based Traceability

Every branded local product (e.g., Mude ko Aalu, Junar, Charikot ko Saag) should come with a barcode or QR code that tells the buyer:

- **Where it was grown**
- **Which farmer grew it**
- **When it was harvested**

This will help us build trust and make sure only genuine products earn the regional brand value. Countries like India, Thailand, and even Bhutan are moving toward this with Geographic Indication (GI) systems. Nepal shouldn't fall behind.

Local-Level Procurement System

Each gaupalika or nagarpalika should set up a system where:

Farmers can sell directly to the municipality at a seasonally fixed base price

The local government becomes a wholesale buyer for school meals, hospitals, canteens, and cooperatives. This removes the need for middlemen in remote areas, stabilizes income, and

ensures food security in institutions. Farmers get a guaranteed buyer, and government bodies get fresh, traceable food.

Seasonal Floor Pricing

Farming is unpredictable. But policy can reduce the risk by setting a seasonal price floor, a minimum guaranteed rate per crop during each season, based on:

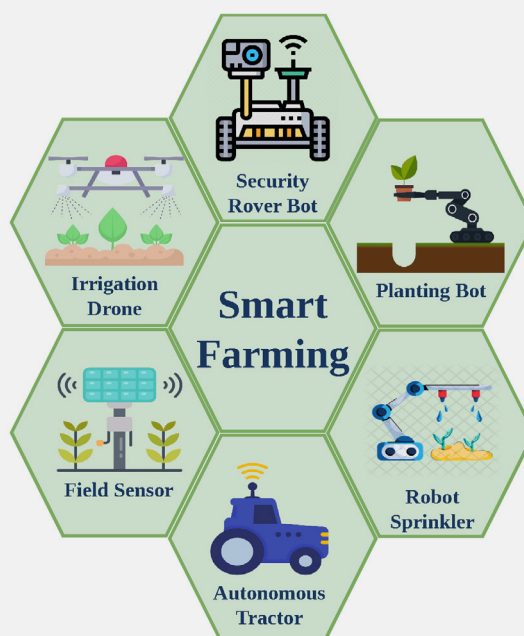
- **Cost of production**
- **Market demand**
- **Transportation access**

This can be reviewed yearly by agricultural offices and farmer cooperatives, ensuring no one sells below survival value.

If the right policies are implemented, if farmers are paid fairly, branding is protected, and traceability is ensured then Nepal doesn't need to look far for prosperity.

This country has always been about agriculture, identity, and resilience. When systems start honoring authenticity, even those who left their fertile villages for Kathmandu or left Kathmandu for foreign lands will look back and see farming not as failure, but as opportunity. They will return not as farmers begging for market space but return as entrepreneurs with land, brand, and pride.

That's when Nepal will truly revive. Not just in crops or GDP, but in confidence.



Carbon Neutrality in Nepal's Industrial Sector: Vision or Reality?

1. Introduction

Nepal has set ambitious climate goals, including achieving net-zero emissions by 2045 as part of its updated Nationally Determined Contributions (NDCs). While much attention has been given to the energy and forestry sectors, the industrial sector, a growing contributor to greenhouse gas (GHG) emissions, requires serious consideration. The pursuit of carbon neutrality in Nepal's industrial sector is a complex but necessary journey. This article explores where the country currently stands, the pathways to carbon neutrality, and whether the vision is aligned with practical reality.

2. Emissions Profile of Nepal's Industrial Sector

According to the Ministry of Forests and Environment (MoFE), the industrial sector contributed approximately 12% of total GHG emissions in 2022 and in 2023, primarily from cement, brick, metal, textile, and food processing industries. These emissions stem largely from:

- Industrial Combustion (coal, furnace oil, diesel)
- Clinker production in cement plants
- Inefficient heat processes

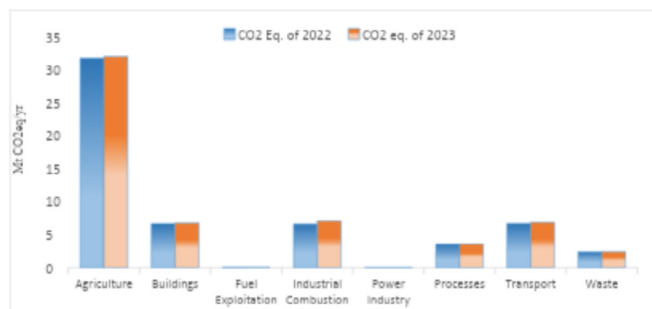


Figure 1: GHGs emissions from different sectors

3. Defining Carbon Neutrality for Industry

Carbon neutrality involves balancing emitted CO₂ with equivalent offsets or removals. For industries, this means:

- Minimizing energy related emissions
- Improving process efficiency
- Switching to clean fuels and technologies
- Using carbon offsets (e.g., afforestation, carbon trading)

4. Early Initiatives and Emerging Trends

Some industries in Nepal have started integrating cleaner technologies:

- Hydro powered cement mills have replaced diesel-based grinding
- Electric boilers are being piloted in food and textile sectors
- Biomass gasifiers are used in rural agro-processing industries

However, these initiatives are isolated and lack scale. The

below pie chart (Figure 2) shows that still industries rely heavily on non-renewable sources of energy. Only 9% of electricity is used so far.

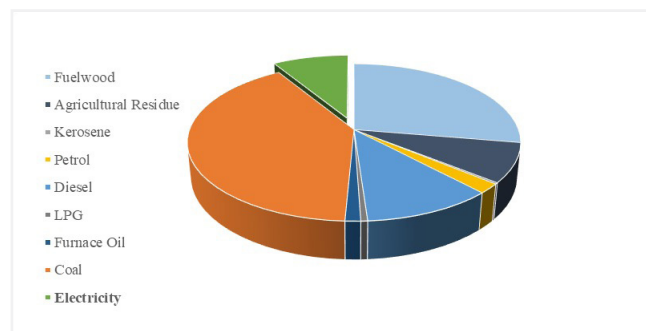


Figure 2 Energy Consumption Patterns in Industrial Sector

5. Key Barriers to Achieving Carbon Neutrality

a. Heavy Dependence on Fossil Fuels:

Coal and furnace oil remain the dominant fuels for high-temperature processes.

b. Lack of Technological Capacity:

Few industries have the technical know-how or infrastructure to transition to lowcarbon alternatives.

c. Financial Constraints:

The high upfront cost of low-emission technologies and limited access to green financing.

d. Policy Gaps:

Current environmental policies are fragmented and enforcement is weak, particularly at the provincial and local levels.

e. Data and Monitoring Deficiencies:

Reliable emissions and energy consumption data are scarce, making it difficult to track progress or set benchmarks.

6. Roadmap to Carbon Neutrality

To turn the vision into reality, Nepal must adopt a multi-pronged approach:

a. Take advantage of the growing hydropower surplus to replace fossil-fueled boilers and dryers.

b. Energy Efficiency and Waste Heat Recovery: Mandate energy audits, retrofit inefficient systems, and invest in heat recovery technologies.

c. Fuel Switching: Promote biomass, biogas, and green hydrogen as alternatives for thermal energy.



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d. Carbon Capture and Offsets: Pilot carbon capture in cement plants and invest in forestry-based offsets.

e. Policy and Incentives

- Establish a National Industrial Decarbonization Framework
- Offer tax breaks and soft loans for low-carbon technology
- Integrate carbon neutrality into industrial licensing

Here, (Figure: 3) is the suggested roadmap to carbon neutrality in Nepal's industrial sector.

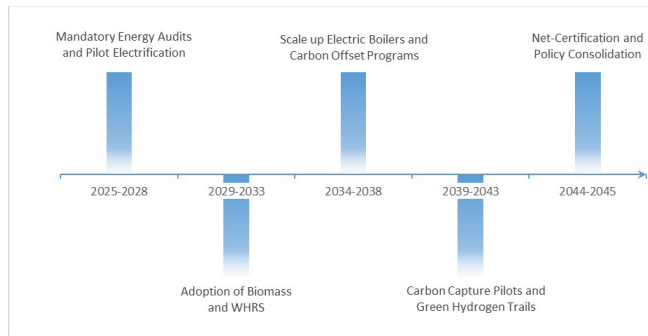


Figure 3 Roadmap to Carbon Neutrality in Nepal's Industrial Sector

7. Case Study: Cement Industry as a Carbon Hotspot

Nepal's cement industry emits over 3 million tonnes of CO₂ annually, primarily due to fossil fuel consumption and clinker production processes. Among industries, Arghakhanchi cement is advancing toward decarbonization. Arghakhanchi Cement is recognized as the first cement manufacturer in Nepal to install a Waste Heat Recovery (WHR) system, marking a significant milestone in industrial energy efficiency. To control particulate emissions, the plant has also deployed an electrostatic precipitator (ESP), ensuring compliance with global air quality standards. The facility is commissioning a 4 MW WHR power generation system that captures hot exhaust gases at approximately 240°C from its chimneys, this system will generate clean electricity without additional fuel input, contributing to a projected 18% reduction in carbon emissions.

If such measures were scaled across the national cement sector, Nepal could potentially reduce industrial emissions by up to 25%, reinforcing the viability of energy recovery and electrification as part of its long term carbon neutrality strategy.

8. Conclusion

Carbon neutrality in Nepal's industrial sector is not just a climate imperative, it is an economic and technological opportunity. While the vision is ambitious, a strategic blend of electrification, energy efficiency, cleaner fuels, and institutional support can make it achievable. The journey will require bold leadership, cross-sector collaboration, and a willingness to invest in the future.

"Whether vision becomes reality depends on what Nepal does today."



Carbon neutrality isn't a distant dream; it's Nepal's next industrial revolution. From waste-heat-powered cement factories to hydro-driven factories, the blueprint for a zero-emission future is already present.

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WHY DRONE FOR AGRICULTURE IN NEPAL?

Picture this, a lush field filled with crops of the season, blooming under the sun and growing from soil so fertile, you'd think you're somewhere where the skyline might meet heaven. Now, when you think of these fields, what is the first place you think would have a production on such a large scale?

Surely, Nepal, an agricultural country blessed with unique geography, should be high up there in the scale of having this dream landscape filled with grains.

Unfortunately, our nation is not there; Nepal is still backwards in agriculture despite having agriculture as a bedrock of the nation's economy and livelihood. There are ongoing challenges in the industry with low productivity, large-area farming being seen as traditional, high vulnerability to climate change and labor shortages. This contributes to the country's ongoing challenges to achieving complete food security and sustainable development. Drone technology emerges as the most appropriate solution to improve the agriculture sector in Nepal by offering capabilities in precision agriculture, optimized resource management, higher productivity, and enhanced climate resilience. Its ability to automate labor-intensive work is a crucial feature that makes it necessary for the sector. It has multiple potential to be a boon for agriculture in Nepal, some of its key features are:

Closing production gaps and improving food security in heterogeneous terrain:

Nepal is suffering a severe setback of low productivity with significant obstacles to address the needs of a growing population, culminating in lack of food security. Thus, drones are addressing this dilemma leading us down the path of precision farming. Precision farming allows for soil and crops to be supplied with exactly what they require to be the healthiest and highest yield, honoring the 3R rule of right time, right place and right amount. Drones are helping with crop monitoring, providing easy access and farm assessment for improved productivity.

Optimization of resources - Water, Fertilizer, Pesticide
Traditional agriculture relies on the erratic rainfalls; climate change has affected this unpredictability, making the procedures for crop plantation and other activities terrible, stressful and uncertain. Therefore, this drone can produce a moisture map of fields to determine specific areas that need water and then provides the opportunity for optimal supply of water resources which lowers operational costs. Precision application of fertilizer and pesticides also allows to manage the over utilization of these inputs while also managing the cost of labor by reducing the operational cost of manual application. It also has health benefits



To stop brain drain, make farming high-tech: Drones turn backbreaking labor into a career the next generation will embrace.

for farmers - less potential for exposure to unwanted pests and toxic chemicals that are inherent with pesticide applicators. This supports Nepal's objectives for sustainable agriculture.

Constructing Climate Resilience and Disasters Response

Nepal experiences the consequences of climate change and unusual weather patterns; i.e., landslides, floods etc. Drones provide detailed, real-time geospatial data mapping and recognizing subtle changes in the topography for proactive mapping of flood and landslide risks. The drones are not only devices for improving agricultural yields, they are part of national climate resilience and disaster risk reduction strategy. Their use extends well beyond the farm gate protecting agricultural land and keeping rural communities and farmers safe from shocks from the environment.

Overcoming Geographical Barriers and Labor Shortage: Nepal has an impressive land topography consisting of the flat terai, hilly slopes, and the Himalaya. Nepal's mid-hills region, comprise 43 % of the national land area of Nepal and is characterized by very poor mountain terrain and the very large degree of variation in elevation over very short distances. These attributes create a particularly challenging physical environment for crop production. As a result of these constraints, the hills have developed a high incidence of terraced fields that take advantage of the



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rapid slope changes, including slopes covering an area equivalent to 30% of the slope area that consists of the only arable land available. Large agricultural equipment is often used on flat ground, as it is often impractical or even impossible to use on steep slopes. Drones represent a high potential value in the context of steep hillsides and the muddy terraces that are common in the region, and often the small fragmented plots of land where standard equipment cannot.

The other important component is working with labor shortages by avoiding the labor-intensive and physically challenging activities. With respect to future opportunities, when you ask a bunch of students what they want to do in

the future, do they even say farming?

Why don't they say farming? Because the farming scenario in Nepal is miserable. They mostly don't want to be engaged in physically demanding tasks under the heavy sun, using traditional approaches to achieve low productivity.

In a country like Nepal, which has a massive brain drain problem, the only approach to keep the younger generation attracted to agriculture is to introduce modern agriculture, use technology like drones, and improve the agriculture sector.

With this in mind, knowing the benefits of agriculture in Nepal, and knowing the challenges, drone technology is more than a diversifiable improvement for Nepal's agricultural industry; it is an increasing requirement, and an essential driver of environmentally sustainable agricultural practices for future food security; enabling precision agriculture, improving productivity from data-driven decisions, enhancing climate resilience from responding to disasters, optimizing use of resources through targeted applications, and overcoming geographical obstacles and labor issues relating to the terraced landscape of Nepal.

EXPLAIN LIKE I'M ACTUALLY FIVE

Why Drones Are Like Superheroes for Nepali Farmers

Think about a big green field where only the healthiest and tastiest food grows — like rice, corn, and vegetables. In Nepal, there are a lot of people who do nothing but grow food like this. However, at times, it can become really difficult.

Farmers have to:

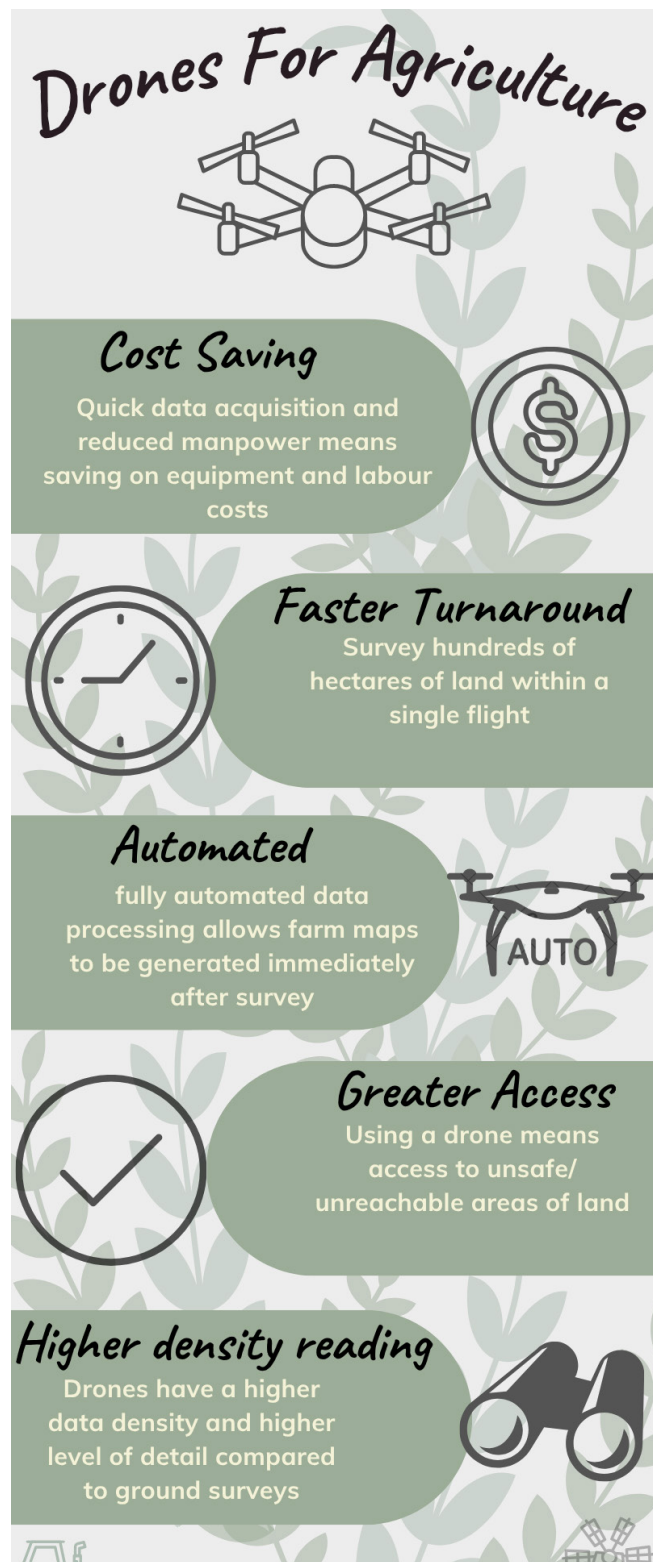
- Work all day under the hot sun
- Carry heavy water or spray medicine on plants
- Climb up and down big hills to check their crops
- Guess if plants need water or food?
- That's super tiring, right?

But guess what? Drones can help!

Drones are like flying robots that zoom in the sky. They can do lots of cool things to help farmers without getting tired.

What can drones do?

- They fly over the farm and look at the plants. – Like a superhero with super eyes!
- They can spray water or medicine only where it's needed. – Not too much, not too little. Just right!
- They can tell which plants are happy and which are sick. – Like a plant doctor from the sky!
- They help when there are floods or landslides. – They can check the land quickly and keep people safe!





PMAMP (Prime Minister Agriculture Modernization Project)

Nepal is experiencing a quiet agricultural revolution, and at its center is the Prime Minister Agriculture Modernization Project (PMAMP). Launched in 2073 BS (July 2016 AD), this ten-year national initiative is designed to transform the Nepali agriculture sector from traditional subsistence practices to a modern, commercial, and sustainable agro-industrial economy.

From hilltop orchards to lowland plantations, PMAMP has impacted nearly every part of the country. Its success in the fruit value chain is particularly noteworthy. The results are clear: increased productivity, improved livelihoods, modern infrastructure, and a new generation of commercial farmers.

Vision of PMAMP

PMAMP aims to:

- Establish specialized zones for major agricultural products
- Promote export potential through value-added processing
- Make agriculture a profitable and respectful enterprise
- Ensure coordination and service delivery among the government and stakeholders

The project is included in Nepal's 15th Periodic Plan and is also connected to the 16th Plan. It supports a wide range of crops, including rice, wheat, vegetables, bananas, citrus fruits, apples, livestock, and export goods like coffee and turmeric.

The Implementation Framework
PMAMP operates through a tiered system of:

- Pockets
The smallest unit, usually about 10 hectares, focused on small-scale commercial agri-business production centers.

- Blocks
A medium-sized area, approximately 100 hectares, is designated for commercial agricultural production centers.

- Zones
A region of roughly 500 hectares or more focused on commercial agricultural and processing centers.

- Super Zones
The biggest unit, which is more than 1,000 hectares, is designed for the large-scale commercial agriculture production and industrial centers.

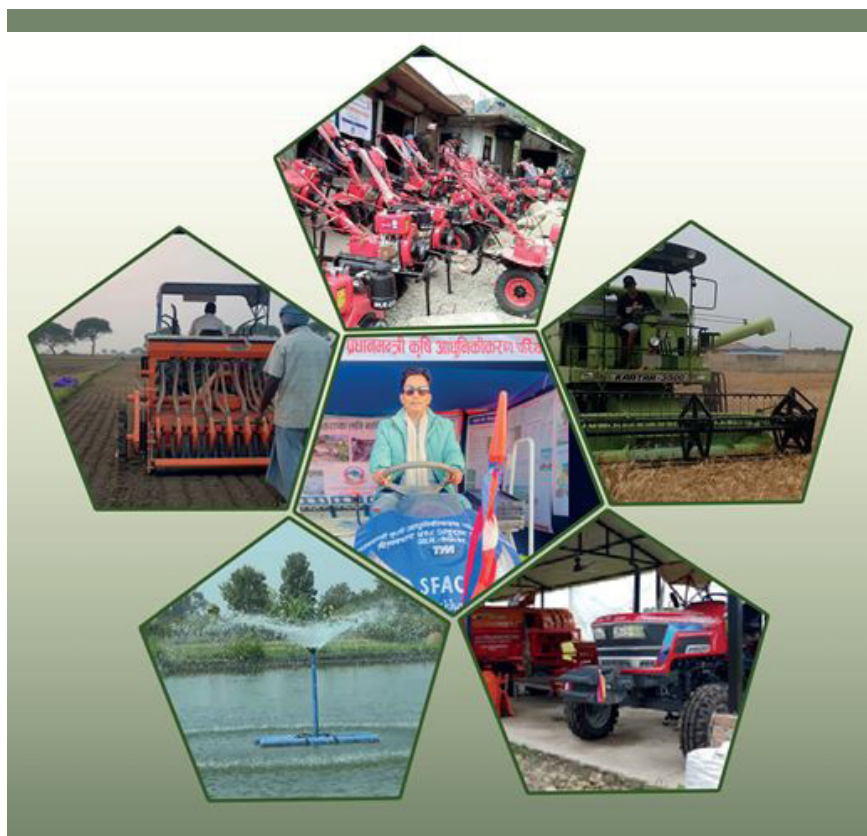
As of FY 2081/82 BS, over 206 zones and 16 super zones have been established across Nepal. Each zone focuses on a specific product and is backed by targeted infrastructure, including:

- Small-scale irrigation systems
- Cold storage facilities
- Processing units
- Model nurseries and tissue culture labs

Measurable Achievements

By 2024 AD (2081 BS), the results of PMAMP are impressive:

- 14.7 lakh households served
- Thousands of hectares of land converted to modern farming
- Over 25,000 permanent and 7.7 lakh temporary jobs created
- A significant boost to national food supply that reduces import reliance





Challenges to Overcome

Despite strong results, PMAMP faces several challenges:

- Citrus greening disease, nutrient deficiencies, and issues with cold chain logistics
- Shortages of banana plantlets and threats from TR4 disease in western Nepal
- Complicated insurance procedures and limited access to credit for rural areas
- Underdeveloped processing sectors for many crops

What's Next?

PMAMP's future goals include:

1. Branding of Local Fruits

Locally available fruits such as Sindhuli Junar, Syangja Orange, and Jumla Apple can be branded to fetch higher prices in the domestic market and also boost exports. Such a move will help farmers get better prices and also allow Nepal to participate in niche global markets.

2. Agro-Tourism

Connecting farming of fruits with tourism activities like staying with a family that grows citrus fruits or visiting a banana farm can be a new source of rural income. Besides the mentioned benefits, it also makes the visitors aware, has a positive impact on the local culture, and creates uninterrupted employment.

3. Processing Industries

Setting up units to produce juices, jams, chips, and dried fruits means that there are fewer losses after the harvest, and the market value is also increased. It helps rural enterprises, leads to the creation of jobs, and opens up the possibility of exporting the processed goods.

Case Study

Banana Zones – Growing Gold in Chitwan:

Banana farming under PMAMP showcases agricultural transformation:

- Area expanded from 2,305 to 3,613 hectares
- G-9 also proved to be more resistant to Panama Wilt
- G-9 variety introduced, with yields of 45.5 MT/hectare compared to 32.2 MT for traditional Malbhog.
- 15 ripening chambers built, 2 in Bardiya, 12 in Chitwan, and 1 in Rautahat
- Farmers in Chitwan reported sales exceeding NPR 50 crore, with a net profit of NPR 22.67 crore by selling G-9 bananas.
- G-9 bananas earned farmers NPR 5.66 lakh/hectare in Year 2, nearly double that of traditional types.

Citrus Fruits – From Fragility to Fortitude:

Sindhuli's Junar fruit had long suffered from fruit fly damage, leading to losses of up to 60%. PMAMP's innovative protein bait traps have reduced this to only 3%. In addition to pest control, citrus zones have seen:

- Area grew by 5,512 hectares from 7406 to 12918 hectares

- Establishment of 22 cold storage facilities and 221 nurseries
- Annual production rise by 42,442 MT
- National citrus demand coverage increases from 30% to 70%

Apples & High-Density Farming:

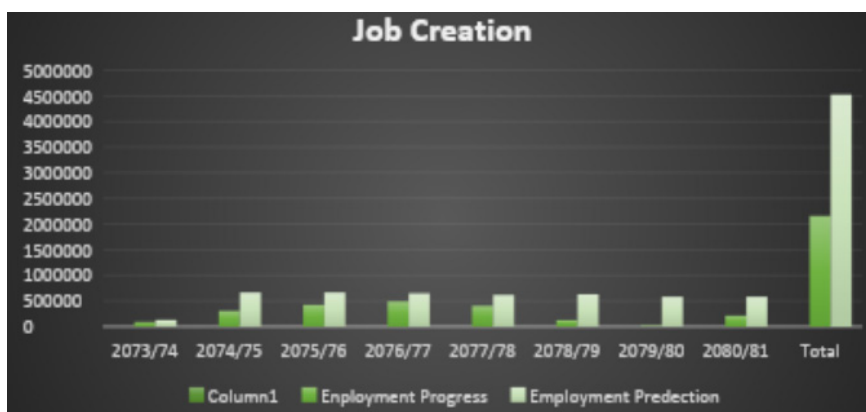
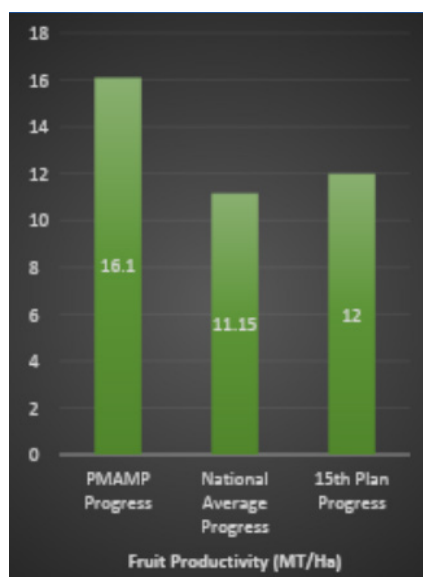
In high-altitude regions like Jumla and Mustang, PMAMP introduced High-Density Planting (HDP):

- Yield per hectare rose from 8.51 MT to 16 MT (Jumla) and 20 MT (Mustang)
- Plant spacing decreased from 6×6 m to 3×4 m, increasing tree density 22-fold
- Selling prices improved with quality branding and grading machines to 150-200 per kg.

Infrastructure, Innovation & Value Addition:

PMAMP has also invested in essential infrastructure and innovation:

- Processing units for apples, oranges, jams, and juices
 - Tissue culture labs for disease-free plants
 - Drip irrigation systems for efficient water use
 - Agro-tools, storage facilities, and training programs for farmers
- Value-added products now include: Banana chips, apple wine, citrus marmalades, and even banana-fiber textiles—all supporting agribusiness entrepreneurship.





4. Seasonal Extension

In this way, by planting fruit varieties that are early and late, farmers will be able to offer their produce even after the usual harvest season has ended. This not only provides a steady income, but also prevents the markets from fluctuating and cuts down the number of imports during the off-season.

The Prime Minister Agriculture Modernization Project (PMAMP) has proven that with a competent approach, proper funding, and a clear direction, farming can become a powerful engine of inclusive growth. Through the integration of advanced technology, structured programs, and targeted infrastructure, PMAMP has:

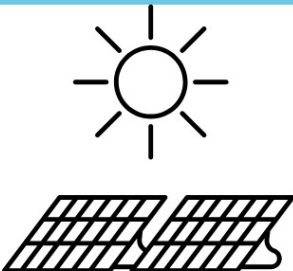
- Helped over 14.7 lakh families
- Expanded fruit cultivation over thousands of hectares
- Boosted incomes, reduced post-harvest losses, and supported rural enterprises

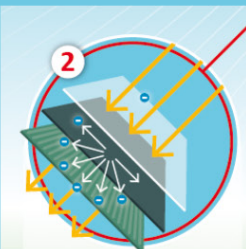
However, its greatest contribution goes beyond numbers. The PMAMP program has definitely restored dignity to farming, boosted the confidence of young entrepreneurs and has positioned Nepal in the prime spot of the global agri-markets. The project is coming to an end in 2083 BS, and there is no doubt that the future of its journey is very clear: leveraging the success, addressing system challenges, and tapping into new opportunities through branding, innovation, and environmental consciousness. If regenerated and purposefully scaled, PMAMP will not only be the game changer of agriculture in Nepal but also help transform Nepal itself.

ELI5 HOW DO SOLAR PANELS WORK?

PHOTONS FROM SUN

Light from the sun is made up of tiny particles called photons. These photons hit solar panel and knock electrons free of the silicon atoms in solar cell.



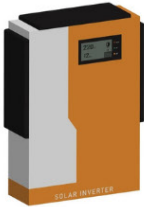


ELECTRICITY!

These loose electrons now are free to move, creating an electric current by moving from negative to positive. They pass through layers of the solar cell.

TO THE INVERTER

the electric current flows to the edge of the panel into a conductive wire, which leads to the inverter.



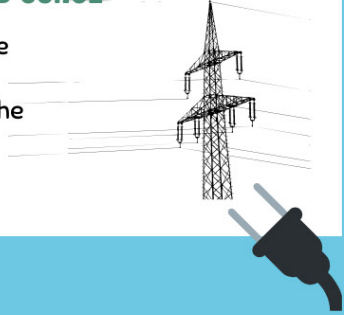


DC TO AC

The inverter converts the direct current to alternating current which is what is used to provide power.

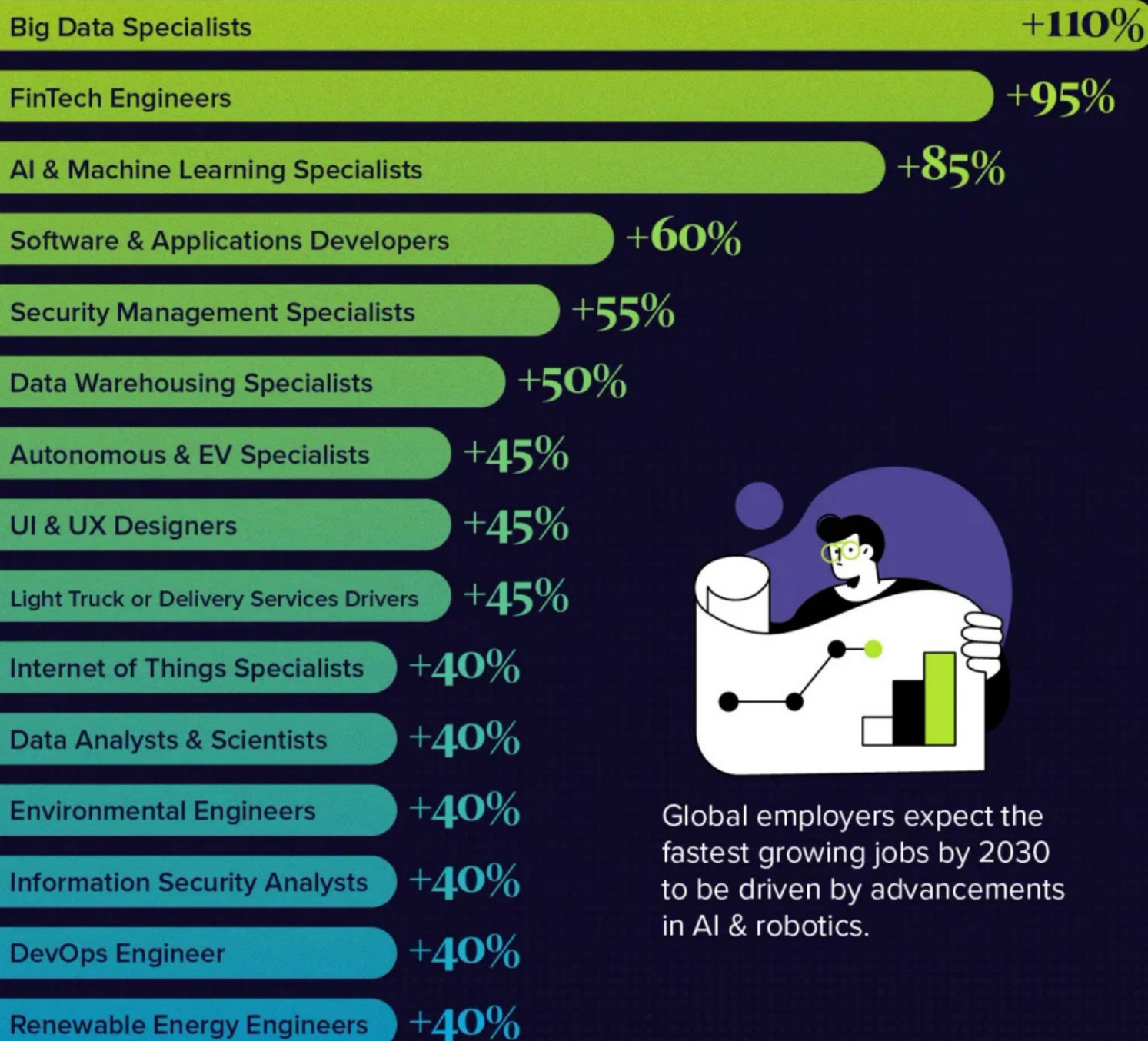
TRANSMISSION, STORAGE AND USAGE

this electricity then transfers to the battery for later use and other appliances connected to use or if the panels are connected to meter, excess electricity is transferred to grid while meter runs backward.

The World's Fastest GROWING JOBS

Net growth, 2025–2030



Global employers expect the fastest growing jobs by 2030 to be driven by advancements in AI & robotics.

Source: https://reports.weforum.org/docs/WEF_Future_of_Jobs_Report_2025.pdf



stable revenue for the government, empowered local taxi operators and cooperatives, and helped manage traffic in ecologically sensitive regions. In contrast, Nepal currently allows foreign vehicles especially from India to operate freely in border towns like Biratnagar, Janakpur, and Nepalgunj, often disadvantaging local transport businesses.

A similar permit-based entry system in Nepal could help rebalance this dynamic. It would encourage the use of Nepali-registered vehicles, creating demand for local fleets, generating employment, and supporting small transport-related enterprises. Moreover, a regulated approach would improve vehicle monitoring, taxation, and safety enforcement. Revenue from permits could also fund provincial development initiatives, such as road improvements and eco-tourism promotion. Given Nepal's geographical similarities with Sikkim, this model is feasible as well as it aligns with the country's broader goals of inclusive and sustainable industrial growth particularly in areas like Dolakha, where stalled projects like the Kharidunga Film City stand to benefit from localized transport and economic policies.

Feasibility and Strategic Potential for Nepal

The adoption of a localized vehicle-use policy in Nepal is both feasible and potentially impactful, provided it is implemented in a phased and inclusive manner. A gradual rollout, beginning with pilot programs in select tourism-focused regions, would allow for policy refinement and consensus-building among stakeholders. Establishing locally managed transport

Reclaiming the Road: Nepal First

In a rapidly evolving South Asian landscape, cross-border mobility has become a symbol of regional integration. The strategic use of vehicle registration policies can become a surprising catalyst for local industrial growth. Nepal's current openness to foreign number plate vehicles, especially in border regions, brings ease of access but at a cost. Foreign vehicles, especially from India and China, freely enter Nepali towns and tourist zones, offering convenience to visitors but quietly tapping revenue and opportunities away from Nepali businesses.

It is time to rethink this model. Implementing a system where only Nepali-numbered vehicles are allowed inside the country for intra-national travel (short durations or certain regions) can yield significant industrial and economic

benefits. This model is inspired by policies in India's Sikkim, where outside vehicles require special permits. Nepal can adopt a localized vehicle permit system that not only boosts local transport enterprises but also fuels long-dormant industrial dreams. If implemented thoughtfully, this policy could pave the road to a new industrial chapter for the country.

What Nepal Can Learn from Sikkim's Permit-Based Transport Regulation?

Sikkim presents a successful example of how permit-based vehicle regulation can be used to promote local economic development and environmental sustainability. By requiring vehicles from outside the state to obtain permits, Sikkim ensures that tourist mobility is largely served by local transport providers. This policy has generated



Nepal can adopt a localized vehicle permit system that not only boosts local transport enterprises but also fuels long-dormant industrial dreams.



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cooperatives or syndicates to oversee permit issuance and coordination would ensure community ownership and operational efficiency. Digital tools for mapping and regulating transport zones, alongside active engagement of local governments and tourism authorities, would be essential for effective implementation and oversight. Crucially, the policy must be designed to prioritize social inclusion, offering licensing, training, and employment opportunities to marginalized and underrepresented groups. If executed with these considerations in mind, the regulation could generate tangible benefits, including expanded employment in the transport sector, increased earnings for local service providers, the growth of regionally rooted tourism models, and better management of vehicular flow in environmentally sensitive areas.

Linking Vehicle Regulation to Film City Development and Tourism Growth

Let me take an example, the introduction of a localized vehicle permits system holds strategic relevance not only for transportation reform but also for broader regional development initiatives, such as the Kharidunga Film City project in Dolakha. A regulated number plate policy would require production crews and equipment arriving from outside Nepal to transition to locally operated transport services. This shift would stimulate demand for domestic logistics providers, including trucks, utility vehicles, and passenger shuttles, thereby fostering local fleet development and employment. Moreover, the integration of film and

tourism presents an opportunity to create sustainable circuits linking Kathmandu, Janakpur, and Dolakha. As interest in film tourism grows, visitors seeking to explore filming locations, cultural exhibits, or studio tours would rely on locally registered vehicles, empowering transport entrepreneurs and enhancing income for local communities. This would directly benefit surrounding towns such as Charikot, Jiri, and Kharidunga, where associated services hotels, restaurants, and vehicle rentals would experience increased demand.

Additionally, the use of Nepali-numbered vehicles offers cultural branding potential. Themed transportation such as film city shuttles or guided tour vehicles could become part of the destination experience, reinforce place identity and enhance the aesthetic and promotional appeal of the region. In this way, vehicle regulation becomes a catalyst for both industrial activation and tourism-led local development.

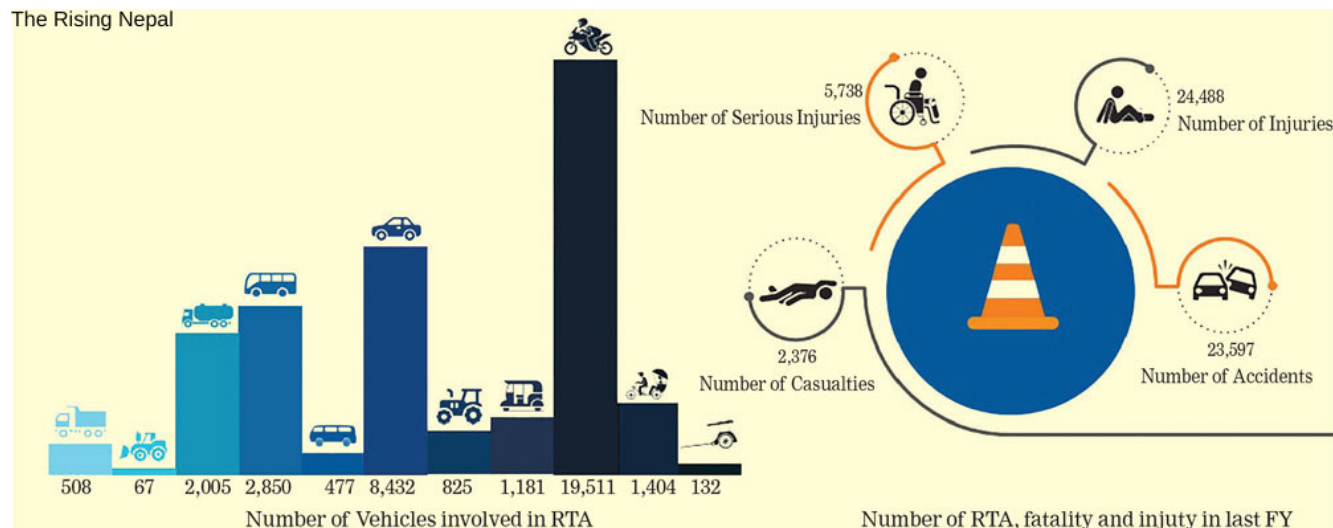
Revitalizing industry in Nepal does not always require large factories or foreign investment; it can begin by leveraging existing systems. A coordinated effort involving transport authorities, tourism bodies, provincial and municipal governments, and local cooperatives can enable policy integration that supports local economies. When strategically implemented, permit regulations become more than administrative tools, they serve as catalysts for infrastructure growth, employment generation, and place-based development. In doing so, districts like Dolakha could emerge as

hubs of cultural and economic activity. Beyond targeted projects like Film City, a localized number plate system also has broader implications for general tourism across Nepal. By promoting the use of Nepali-registered vehicles, tourists traveling within the country would increasingly rely on domestic transport services such as local taxis, buses, and tour operators. This shift not only boosts income for transport entrepreneurs but also ensures that travel-related spending remains within the national economy. Additionally, it enables better regulation of tourism flow, enhances safety standards, and provides opportunities for value-added experiences like guided tours, cultural storytelling, and eco-friendly travel models.

Industry revival doesn't always require massive factories or foreign investments. Sometimes, all it needs is a vehicle and the right number plate. When a vehicle enters Nepal with a foreign number plate, it silently carries away opportunities; from permit fees to missed taxi rides, from local logistics to tourism jobs. By rethinking our number plate system, and by aligning it with strategic industrial investments like the Kharidunga Film City, we can set Nepal on a path to sustainable and inclusive development.

In this journey of revival, it's time we put our own plates on the steering wheel of progress.

The Rising Nepal





The Story of Palpali Dhaka

Introduction:

Dhaka fabric holds a special place in Nepalese lifestyle. It has been in every Nepalese head as Dhaka Topi, a special cap used by members of Nepalese society. Before Palpali Dhaka was only understood only as the Nepalese caps made of Dhaka fabric, which were worn only by the males. Now-a-days, different kinds of clothes for males & females, children are made out of these fabrics. A variety of apparels can be made for people of all ages from head to the feet like Dhaka shawal, choli (blouse for Nepalese cultural dress), Sari, Kurta, bags, purses, tie, sandles and others. Dhaka is widely available in the Nepalese market these days but once it was only made in Palpa district of western Nepal. Thus, it is more popular as "Palpali Dhaka". It has a rich history deeply intertwined with Nepalese culture and identity. Nepal has a long history & tradition of weaving clothes.

Origins of Weaving in Palpa

The cloth weaving in Palpa dates back to the Magarat Era. At that time, the majority of households had cloth weaving looms in Palpa because of which the cloth woven in Palpa was referred to as "home-woven". This "home-woven" culture of weaving cloth has now vanished in the vast ocean of history. The loom used to make "hand-woven" cloth was made from a type of salla tree (Pine tree) which is the timber widely known as Palpa district that is called Tansing in Magar language. It is said that because the district headquarter was called Tansing in Magar, which went to become Tansen in present days.

According to ECS Nepal, Tusli Meher, who has been sent by Shree Tin Chandra Shamsheer at his expenses to Varda in India to learn to make Khadi, returned to Nepal after doing so, as per Chandra Shamsheer's wish established the Chandra Kamdhenu Charkha Pracharak Mahaguthi in 1983 BS.



From its humble origins in Palpa to becoming a symbol of Nepalese culture, Palpali Dhaka has weathered conflicts and pandemics, now experiencing a revival as artisans and modern techniques breathe new life into this timeless textile

The Mahaguthi established branches in different parts of the country, at this time. Devi Prasad Pradhan of Palpa, who has come into contact with Tulsi Mehar, took the initiative to bring four handloom workers from Kathmandu and began weaving cloth in Palpa. Because the cloth was woven in thicker looms, and the investment costs were higher due to less production, they could not compete with finely woven cloth from outside. Thus the weaving was halted in Palpa.

Birth of Palpali Dhaka

One again in 2015 BS, Ganeshman Maharjan inspired by Dambar Kumari's Dhaka cloths, who had returned to Nepal after learning to weave cloth in India. According to Purna Kumari Maharjan (Ganeshman's wife), he established a textile industry in Palpa named Swoodeshi Bastrakala Palpali Dhaka. In addition to the market problems, raw materials had to be bought from India and it was difficult to compete against the finer quality imported factories which laid to difficulty in sustaining this industry. In 2019 BS, Maharjan who had gone to Kathmandu for training, observed that Shree Tin Janga Bahadur Rana's daughter Dambar Kumari, who lived in Babaras (Varanasi) in India used a special kind of colorful, fine and valuable textile fabric called "Dhaka fabric" which was made in a place called Dhaka in the undivided state of Bangal. At that time, this fabric was called "Chamua Dhaka". This fabric was known as "Dambar Kumari Dhaka" in Nepal. At that time, Dhaka was used by only Rana families & other higher classes families. Having caught his attention by "Dambar Kumari Dhaka", he returned to Palpa and



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adopted the technology to weave Dhaka in Palpa. This is how the attractively coloured and patterned “Palpali Dhaka” was born.

With many challenges & difficulties in the beginning, overcoming the challenges of inconvenient transportation facilities, market problems, less production & many other difficulties, Palpali Dhaka succeeded in establishing its own identity all over the country from 2024 B.S. After then, many other Dhaka industries were established and Dhaka production bloomed in Palpa district.

Golden Era of Dhaka Industry

The Dhaka industry in Palpa started in the late 1950s. The industry flourished for almost three decades. During its heyday, it employed more than 2000 weavers, and the distinctive cloth was sold over 36 districts across Nepal. Imported products were scarce & expensive, Nepalese bought the textiles from Palpa in large quantities. In this way, the Palpali Dhaka industry was at its peak in the early 1990s. But there were hard times too in 1996, the Maoist conflict erupted and brought ruin to Nepal's economy and small & micro enterprises. Many fled their towns and villages for safety and looms were abandoned. More than 30 factories in Palpa shut down for good and the few that held out operated with drastically reduced output.

Many people had migrated abroad during the conflict in search of work, leaving industries facing acute labour shortages. Palpali Dhaka was in demand again after a few years, but there weren't enough weavers.

Again in the pandemic period, due to corona virus, the Dhaka cloth industries had been infected due to virus infection for 2 years. The arrivals of foreign tourists have sharply decreased who used to buy Dhaka fabric souvenirs in large quantities. So the trade on this textile has slumped. Even the textile manufactured had not sold.

Revival and Modernization:

While Dhaka was once primarily associated with special occasions and specific communities, it has experienced a rival in recent years with young Nepali women incorporating it into everyday wear. The use of the Jacquard technique has also allowed for mass production, though hand woven Dhaka still maintains its value.

Current situations & its usages:

The sale of Palpali Dhaka fabric has seen a rise since 2022, especially during the Tihar festival period, with decline in the COVID-19 infection. As per the Cottage and Small Industries Office, Palpa, twenty-four industries manufacturing the Dhaka fabric have been registered in Palpa district. More than 5,000 people are employed in these industries.

Today, Dhaka is used to make various items, including caps, jackets/coats, shawls, blouses, bags, tie, purse, sari and many more. It is a popular gift items during festivals and ceremonies.

Challenges & Revivals:

Despite of many ups and downs, the Palpali Dhaka textile business is experiencing resurgence, with increased sales and efforts to revitalize the industry. While the business faces

challenges like competition like cheap imports and the need for stronger branding, there are initiatives focused on skill development, standardization and market expansions.

Role of Palpali Dhaka Association (PDA)

Palpali Dhaka Association (PDA) with the aim of revival of Palpali Dhaka Industries, preserving the indigenous technique of hand weaving Dhaka Cloth to pass for future generation and improving the working conditions for weavers, was established in 2076 B.S. (2020 A.D.). This Organization aims to standardize the quality of Palpali Dhaka and introduce the finest quality Handmade Dhaka fabrics in National and International Markets. The association also looks for the welfare of the people associated with Dhaka weaving. The association is more focused to improve the current working conditions of weavers by providing skill trainings on Dhaka weaving and others with the combined technical and financial supports from different stakeholders including UK-aid, Label-step, NYMA, NMB Bank, Province Government, Tansen Municipality and working on a project Named Partnership for Growth of Nepali Dhaka (PGND) to take Palpali Dhaka into new heights

Message from Author

“As an architect from Palpa, I've always believed that true design isn't just about buildings, it's about preserving the soul of a place. To all new engineers: your knowledge has power. Let's not just dream of change, let's build it here. I call on the youth to rediscover the legacy of Palpali Dhaka, to weave innovation into tradition, and to craft industries that honor our culture while shaping a sustainable future. Palpa gave us stories in threads, let's carry them forward with pride.”

DID YOU KNOW?



Kharidunga Film City: A Sleeping Industrial Giant

Amid Dolakha's rolling hills lies Kharidunga once known for its dolomite mines, now reimagined as Nepal's upcoming Film City envisioned by the Film Development Board of Nepal, initiated to create a world-class shooting destination, the project promised both creative and industrial momentum. But progress has been mixed. This construction of the project began back in 2011, but as of May 2025, less than 25% of work is completed. The site remains largely inactive, with no filming yet initiated. This ambitious project was intended to promote Nepal's film industry, encourage tourism and stimulate the local economy. The area, known for its scenic beauty and relatively undisturbed natural landscape, was a perfect fit for large-scale outdoor shooting. However, despite announcements

and even budget allocations in past fiscal years, the project has failed to materialize. To date, only three buildings; a cultural museum, administrative block and guest house have been constructed using Rs 650 million provided by Bagmati Province government. A lack of inter-ministerial coordination, weak infrastructure, insufficient follow-up from stakeholders and political instability are among the many reasons cited for this failure (Farsight Nepal, 2023).

This has not only been a missed opportunity for the film sector but also for the local communities in Dolakha who could have greatly benefited from the influx of film crews, tourists and allied service industries.

Budget Summary Table

Fiscal Year	Funding Source	Allocation (NPR Million)	Purpose / Outcome
~2021/22	Bagmati Province	~35	Initial infrastructure: info center, guesthouses, gate
.	Local Municipality	~6.8	Support to local-level facilities
~2022/23	Bagmati Province	~30	Finishing guest houses, walls, entrance, etc.
.	Federal Government	~4	For studies, monitoring (not construction)
Up to mid-2025	Bagmati Province	~650	Larger infrastructure buildings (museum, admin block)

8 Types of Data Analysis Method



Descriptive Analysis

Summarizes data to show what has happened. It often uses statistics like mean, median, and mode.

01

02



Diagnostic Analysis

Identifies the cause behind past outcomes by examining relationships between variables.

03



Predictive Analysis

Uses historical data to forecast future events, often employing machine learning techniques.

04



Prescriptive Analysis

Suggests actions to achieve desired outcomes by combining insights from descriptive, diagnostic, and predictive analyses.

08



Quantitative Analysis

Involves numerical data and mathematical models to derive insights, commonly used in economics and finance.



Qualitative Analysis

Focuses on non-numerical data like text, images, or videos, often used in social sciences and market research.

07

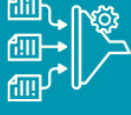
06



Inferential Analysis

Makes generalizations about a population based on a sample of data, often using techniques like regression analysis.

05



Exploratory Data Analysis

Involves analyzing data sets to find patterns, anomalies, or hypothesis without predefined assumptions.

Driving Public Sector Productivity and Quality

Insights from APO Learnings and Field Implementation in the public institution

The evolving dynamics of both industry and public service delivery demand a unified approach to productivity, quality, and organizational excellence. This article synthesizes insights from the Asian Productivity Organization (APO) course conducted in Sri Lanka and a practical productivity analysis of field visits to public institutions in Colombo. Together, these resources offer a roadmap for transforming institutions through a culture of productivity.

Understanding Productivity Foundations: Lessons from APO

The APO training emphasized foundational models such as the Business Excellence Framework (BEF), Value-Added Productivity Measurement (VAPM), and tools like 5S, Quality Circles, LEAN methodologies and Smart manufacturing which are not just applicable to factories or industries; their core principles like elimination of waste, continuous improvement, and employee engagement that are directly transferable to service delivery environments. Smart manufacturing, for instance, stresses digital integration to increase efficiency, something that can be adopted in government offices via e-signatures, QR tracking, or automated document handling.

Case Analysis: Public institution in Sri Lanka

A field-level productivity analysis was carried out at the public institution in Sri Lanka. The institution serves over 250,000 urban residents and faces common service bottlenecks like manual processing, overburdened counters, and inadequate infrastructure. The analysis focused on details of vital civil registration, revealing that for birth certificate issuance, it took 33 minutes per person, mainly due to only one functioning cashier counter and citizen frustration and low staff morale were prevalent.

Implementation of Productivity Tools

Using APO's frameworks, several implementation techniques were recommended introduced for scenarios like mentioned below:

A 5S audit for cluttered workspaces and broken equipment.

A structured workplace improvement strategy was suggested to implement using the principles of the 5S methodology i.e. Sort, Set in Order, Shine, Standardize, and Sustain to address disorganized spaces, unused materials, and faulty equipment. The process can begin by identifying and removing unnecessary items to reduce clutter. Tools and frequently used materials can then be arranged with clear labeling and allocated

storage spots to improve accessibility. Thorough cleaning can be carried out across work areas, during which damaged items can be noted for repair or disposal. To ensure consistency, standardized procedures can be introduced for cleaning and upkeep, supported by visual guides and clear instructions. Long-term sustainability can then be achieved through regular internal reviews, ongoing staff orientation, delegated responsibilities, and scheduled maintenance routines. Altogether, these efforts will contribute to smoother daily operations, enhanced safety, and a more organized, efficient, and inviting environment for both staff and service users.



The integration ensured faster, more transparent, and efficient service delivery, resulting in a 30% reduction in service processing time.

ASCI framework to identify service expectations vs delivery gaps

To address the mismatch between public expectations and actual service delivery, the ASCI framework i.e. Assess, Set, Compare, Improve, was suggested to apply to guide systematic improvements. Feedback gathered through surveys and interviews revealed key issues such as long waiting periods, unclear guidance, and a lack of transparency in service processes. In response, specific performance goals were established, and gaps between expected and actual service levels were analyzed. Improvement measures included enhancing queue management systems, providing clearer instructions to service users, and strengthening accountability mechanisms. To further close the gap, it was recommended to integrate customer insights into service design, offer targeted training to frontline staff, implement real-time monitoring and feedback



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5 S SYSTEM

Workplace Organizational Method



employee efforts visibly. Trained 5S champions are then appointed within each department to lead and support the initiative, fostering greater employee involvement and motivation. These focal persons will be empowered to take responsibility for monitoring progress, ensuring accountability, and driving continuous adherence to 5S principles. By promoting active engagement and consistently appreciating contributions, this strategy will aim to sustain improvements, boost morale, and embed a culture of ongoing commitment to workplace organization and efficiency.

Expanding Impact through Quality Circles

Implementing quality circles involves forming small, dedicated groups of employees who meet regularly to identify, discuss, and resolve workplace challenges. These teams will encourage collaborative problem-solving by drawing on the collective knowledge and experience of staff members. By fostering open communication and teamwork, quality circles not only generate practical solutions but also build a stronger sense of shared responsibility and ownership for continuous quality improvements across the organization.

Visual Management for Performance Tracking

Using visual management tools such as display boards in common staff areas can effectively communicate service goals, progress, and individual or team achievements. These boards will keep employees informed and aligned with organizational objectives, reinforcing motivation through visible recognition. Furthermore, they serve as a transparent means for the public to observe performance standards, promoting trust and accountability within the institution.

Clear Operating Procedures

Developing and distributing Standard Operating Procedures (SOPs) for all critical tasks is essential to ensure uniformity and clarity in daily operations. Well-documented SOPs will reduce uncertainty by providing step-by-step guidelines that employees can reference, which is particularly valuable for onboarding new staff and maintaining consistent performance. Clear procedures help minimize errors

systems, and introduce standardized benchmarks for service quality. These actions were supported by ongoing data-based evaluations and timely corrective steps, ensuring a cycle of continuous improvement and better alignment with user needs.

LEAN recommendations such as QR-coded certificates and digital registrar signatures

To implement LEAN recommendations such as QR-coded certificates and digital registrar signatures, the certification process can be digitized to enable real-time verification, minimize paperwork and manual errors, improve data security and traceability, and streamline approval workflows. The integration ensured faster, more transparent, and efficient service delivery, resulting in a 30% reduction in service processing time.

By applying LEAN principles to identify and eliminate inefficiencies, a key achievement can be the introduction of electronic signatures and QR codes on certificates. Additionally, establishing an extra service counter during peak hours significantly can increase client throughput. These improvements collectively can contribute to smoother operations, reduce wait times, and enhance user satisfaction.

Morale surveys highlighting the need for recognition systems and focal persons for 5S implementation.

To respond to morale survey results highlighting the importance of recognition systems and dedicated focal persons for 5S implementation, a comprehensive approach was suggested to develop that includes establishing a formal recognition and reward program to acknowledge

and streamline workflows, contributing to more efficient and reliable service delivery.

Boosting Staff Engagement

Based on insights from morale surveys, introducing initiatives like monthly awards, appreciation events, or small tokens of recognition can significantly improve employee motivation. When staff feel valued and acknowledged, they are more likely to be proactive, demonstrate higher levels of commitment, and actively participate in organizational improvement efforts. Strengthening staff engagement will ultimately lead to enhanced service quality and a more positive workplace environment.

Real-Time Feedback Collection

Setting up feedback mechanisms such as kiosks or suggestion boxes at service exit points can enable citizens to share their opinions and experiences

immediately after receiving services. Collecting and analyzing this feedback regularly will allow the institution to identify areas needing improvement and respond swiftly to emerging issues. This real-time input will help create a responsive service culture that continuously adapts to meet public expectations more effectively.

The combined insights drawn from the APO frameworks alongside the practical experiences of the public institution underscore the broad relevance and adaptability of productivity tools across different sectors. Whether applied in private enterprises or public service organizations, the fundamental objective is consistent: to reduce inefficiencies, empower individuals, and achieve high-quality results. Genuine and lasting transformation does not rely solely on advanced technology but emerges through ongoing, people-focused enhancements that

prioritize human engagement and continuous improvement. Moving forward, it is essential for both sectors to adopt productivity not merely as a measurable performance indicator but as a deeply ingrained guiding principle that shapes organizational culture and drives sustainable success.

Agriculture Census Data Comparison

Description	2011	2021	Change
Total farm holdings (Households) (In Million)	3.83	4.13	7.26
Male-headed holdings (In Million)	3.1	2.79	-11.11
Male-headed holdings (In %)	80.9	67.6	
Female-headed holdings (In Million)	0.73	1.34	45.52
Female-headed holdings (In %)	19.1	32.4	
Total farm area under holdings (In Million hectares)	2.52	2.22	-13.51
Total Farm Population (In Million)	20.55	19.45	-5.66
Male farm population (In Million)	10.3	9.54	-7.97
Male farm population (In %)	50.1	49.0	
Female farm population (In Million)	10.25	9.9	-3.54
Female farm population (In %)	49.9	50.9	



सम्पूर्ण वडावासीहरुमा सन्देश

हाम्रो वडा निरन्तर रुपमा शिक्षा, स्वास्थ्य, पूर्वाधार विकास, वातावरण संरक्षण र समावेशी विकासका क्षेत्रमा क्रियाशील छ। स्थानीय विकासमा सबैको साथ, सहयोग र सुझावले हाम्रो अभियान अझ प्रभावकारी र सफल हुनेछ भन्ने अपेक्षा लिएको छु।

नारायण बहादुर सुबेदी, अध्यक्ष

वडा नं - ०५ , गोकर्णेश्वर नगरपालिका



JIRI LAKE : Engineering a New Future for Tourism, Nature, and People



From forgotten gateway to thriving wonder the Jiri Lake will rewrite Nepal's tourism story with water, wilderness, and boundless opportunity.

Rationale Behind the Project: Reawakening the Legacy of Jiri

For decades, Jiri in Dolakha held the reputation as the "Gateway to Everest." Before Lukla Airport existed, every foreign mountaineer seeking to conquer the world's tallest peak walked through the green hills of Jiri. But over time, with the advent of air travel and shifting tourism trends, Jiri slowly faded into the background, its hotels emptied, its economy fell, and its youth left for opportunities elsewhere. But Jiri is not a town to be forgotten. With its untouched beauty, cultural vibrancy, and strategic location, Jiri holds immense potential and now, with the proposed Jiri Dam and Artificial Lake, we have the opportunity to reawaken its soul. As the District Head of the Irrigation and Water Resources Development Division Office, I am proud to share our visionary plan: to engineer an artificial lake at the heart of Jiri that not only revives tourism but also creates jobs, boosts local investment, and becomes a national symbol of eco-tourism excellence.

This project is a multipurpose initiative led by the Government of Bagmati Province. It not only addresses tourism development but also integrates water resource management, local entrepreneurship, and environmental sustainability.

CURRENT STATE OF JIRI: Full of Beauty, Lacking Opportunity

- Municipality: Jiri, Dolakha District, Bagmati Province
- Population: 16,109
- Area: 211.25 sq. km
- Elevation Range: 1,650 – 4,514 meters
- Tourism Footfall (2024): <1,000 foreign visitors/year
- Youth Employment: Decreasing opportunities, increasing outmigration
- Primary Economy: Dairy farming, agriculture, and remittances
- Connectivity: 188 km from Kathmandu via Charikot-Lamosangu-Jiri road

Despite its untouched landscapes, biodiversity, and cultural richness, Jiri today stands as a land of lost potential. For a place that once greeted Everest's climbers, the silence is loud.

THE PROJECT: Building More Than a Dam

The Jiri Dam and Artificial Lake is a multi-objective water infrastructure designed with high-level engineering standards. The project is to be constructed in Ward 4 and 6 of Jiri Municipality.



Er. Rupesh Mahat

District Head, Irrigation and Water Resources Development Division Office, Charikot, Dolakha

Key Technical Parameters:

Specification	Details
Dam Type	Concrete Gravity Dam
Dam Height	38 meters
Dam Length	88.5 meters (including gated spillways)
Reservoir Length	2.1 km
Reservoir Surface Area	123,685.53 m²
Reservoir Storage Capacity	10,14,669.41 m³
Spillway Type	Ogee shaped gated spillway (4 gates)
Gate Size	5 m width × 6.5 m height
Construction Duration	2.55 years (931 days)
Estimated Project Cost	NPR 3.05 Billion (VAT included)
Estimated First-Year Revenue	NPR 98.3 Million

The dam will hold water at a normal water level of 1832 m AMSL, with a high flood level matched to this height. The crest elevation is 1834 m, offering a freeboard of 2 meters.

THE VISION: Designing Tourism with Depth and Integrity

We envision Jiri Lake as a living model of integrated development, engineering serves people, where tourism uplifts communities, and where nature is preserved, not pushed aside.

The artificial lake is not a standalone body of water, it is the centerpiece of a comprehensive eco-tourism and commercial development strategy. The project area spans 34.1 hectares, including 237 ropanis of lake surface, buffer zones, and designated commercial zones.

Surrounding Infrastructure Includes:

- 3.44 km motorable access road (5 m wide)
- 2.67 km foot trails (3 m wide) for cycling and walking
- Entry garden with architectural landscaping
- Thematic parks and flower gardens
- Cultural exhibition centers and amphitheaters
- Waterfront restaurants, viewing decks, and souvenir shops
- Zip-lining, paragliding launch points, and boating facilities
- Public amenities (toilets, benches, trash bins, lighting)
- Solar-powered lighting and water features

A significant portion of the lakefront is planned for sustainable commercial use, including eco-lodges, tea shops, and local handicraft stalls. Meanwhile, regions farther from the dam will be conserved as community forests and eco-reserves to maintain ecological balance.

Strategic Importance for Tourism

Tourism development is the core driver of the Jiri Lake project. The artificial lake will stimulate:

- Eco-adventure tourism: Boating, kayaking, fishing, paragliding, and cycling.
- Cultural tourism: Through fairs, exhibitions, and local traditions.
- Event-based tourism: Hosting conferences, concerts, water festivals, and wedding ceremonies.

- Agritourism: Promoting farm visits, local cheese, and herbal products.
- Winter tourism: The cold climate and clean water make Jiri ideal for cold-water fisheries and hot bath resorts.

This transformation aligns with Nepal’s push toward sustainable, decentralized tourism models, reducing pressure on the overcrowded Everest Base Camp route and broadening tourism benefits to hinterland regions.

SOCIAL AND ECONOMIC IMPACT: Empowering From Within

Jiri Lake will breathe life not only into the tourism industry but into the entire economic bloodstream of Dolakha.

Expected Benefits:

- Creation of hundreds of direct jobs during construction
- Long-term employment in hospitality, tourism, and local enterprises
- Increased demand for local agricultural products (milk, cheese, herbs)
- Promotion of youth entrepreneurship through micro-enterprises
- Women’s cooperatives engaged in handicrafts, food stalls, and guiding
- Surge in real estate values and local investments
- Establishment of training centers for tourism and hospitality skills

We estimate the lake could attract over 50,000 domestic and foreign visitors annually within 5 years of operation.

ENVIRONMENTAL COMMITMENT

As engineers, we hold sacred our responsibility to preserve and protect. This project is guided by the Environmental Protection Act 2077, and every intervention is grounded in eco-conscious planning.

- Minimal displacement of people and landowners
- Community forest agreements and reforestation programs
- Solar and hydropower energy integration
- Strict solid waste management during construction and operation
- Continuous biodiversity monitoring and water quality analysis

Additionally, Environmental Management and Monitoring Plans (EMP & MMP) are being developed to address long-term resilience and adaptive management.

CLOSING THOUGHTS: Jiri Will Rise Again

I often walk through the streets of Jiri and imagine the future: I see boats gently gliding under golden sunsets, laughter echoing from picnic gardens, children learning about hydrology and ecology from their classrooms near the lake, and farmers selling their dairy and produce to curious foreign travelers.

This is not a dream anymore. The funding is real. The blueprints are ready. The community is hopeful. The team is committed.

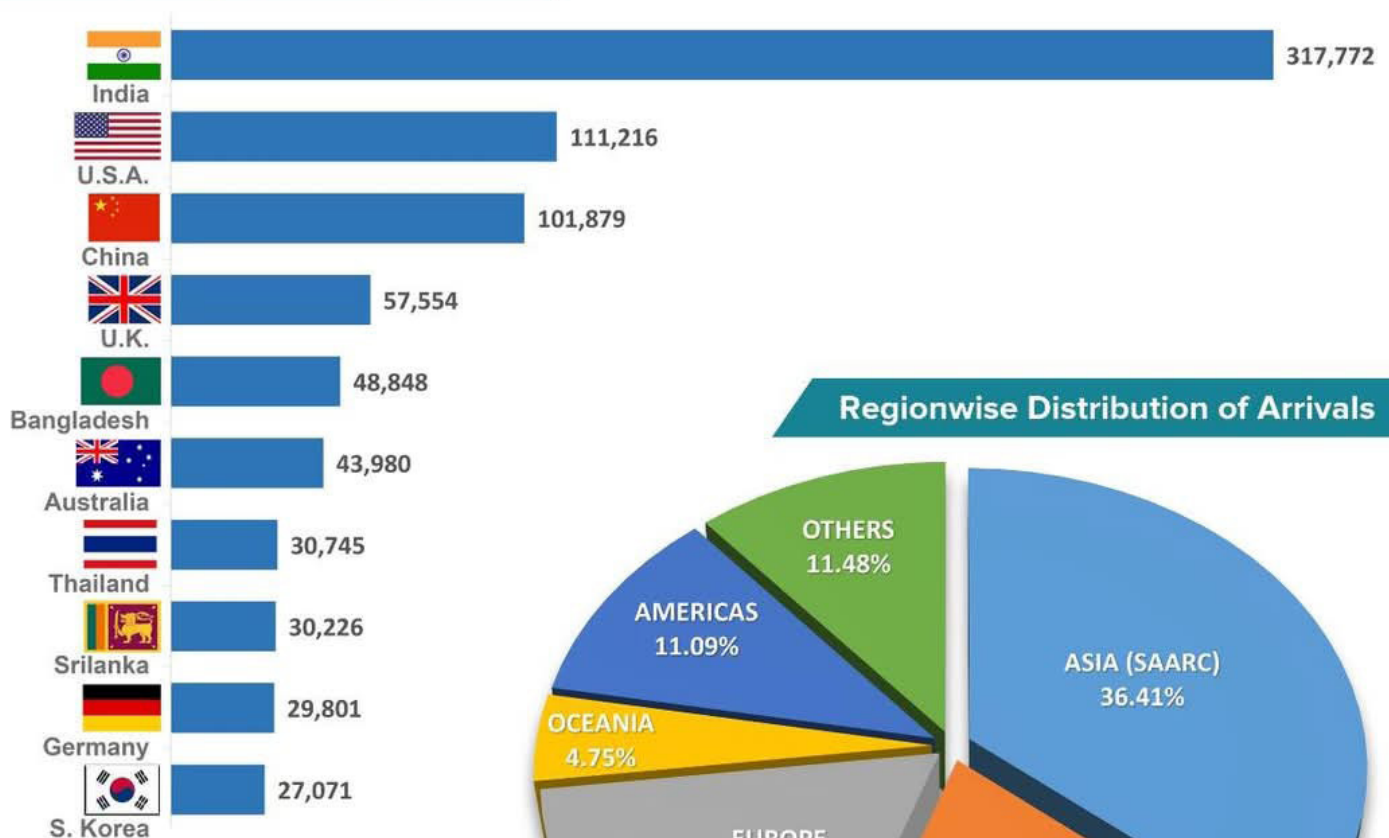
Jiri Lake will not only be a body of water, it will be a body of opportunity—for our youth, for our engineers, and for every citizen who believes that Nepal deserves prosperity not tomorrow, but today.

INTERNATIONAL VISITOR ARRIVALS, 2024

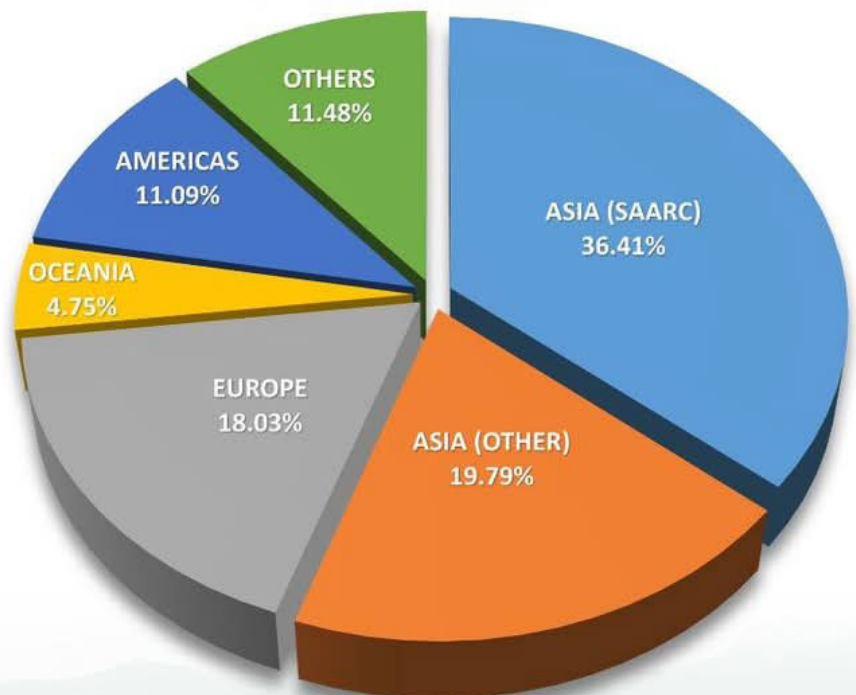
1,147,567



TOP 10 Source Market Countries



Regionwise Distribution of Arrivals



Source : Department of Immigration
Prepared by : Nepal Tourism Board

* This report is based on preliminary monthly raw data provided by Department of Immigration

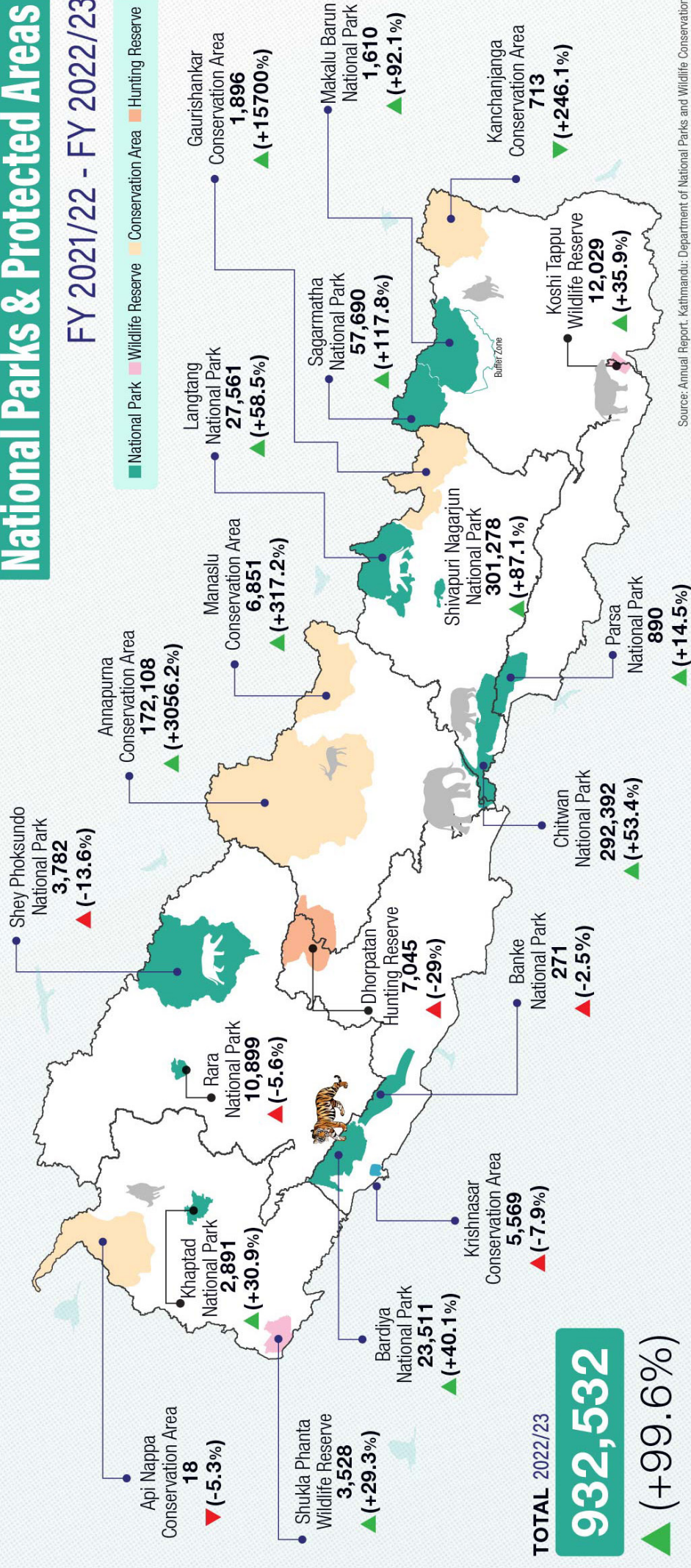


Tourist Visits to

National Parks & Protected Areas

FY 2021/22 - FY 2022/23

■ National Park ■ Wildlife Reserve ■ Conservation Area ■ Hunting Reserve



Source: Annual Report, Kathmandu: Department of National Parks and Wildlife Conservation.



Photo reference: Nepal Tourism Board

Reimagining the Himalayas: Toward a Sustainable Mountain Tourism Model in Nepal

Perched on the spine of the Himalayas, Nepal is not merely a country of summits but of spirit. Its rugged topography, where ethereal peaks converse with the clouds and ancient villages cling defiantly to terraced slopes, offers more than adventure. It offers transcendence. Cradled within these soaring elevations lie spiritual landmarks, cultural hearths, and ecological marvels. While the world knows Nepal for Everest and Annapurna, the full potential of its mountain tourism remains underleveraged, inconsistently governed, and ecologically vulnerable. Behind the reverent gaze of trekkers and climbers lies an industry both potent and precarious. Mountain tourism, though a pillar of Nepal's economy, is riddled with systemic fragility. From the earliest mountaineering expeditions of the mid-20th

century to the trekking booms of today, Nepal's mountains have long captivated global audiences. Regions like Khumbu and Annapurna have shown that tourism, when carefully managed, can uplift remote communities, generate employment for tens of thousands, and alleviate rural poverty. In places like Langtang and Mustang, tourism has helped fund schools, build roads, and even deliver healthcare to areas long ignored by the state.

Yet, this success is uneven. Most economic benefits remain concentrated in a handful of regions. Vast swaths of Nepal's mountainous belt areas no less spectacular in beauty or cultural depth remain invisible to mainstream tourism circuits. Infrastructure remains a major barrier to equitable



Beyond Everest and Annapurna lie hidden gems like Tsum Valley and Dolpo which are the untapped havens where sustainable tourism could rewrite Nepal's economic and ecological story.

development. Roads are either rudimentary or absent in many parts of the Himalayas. Access often relies on unpredictable airstrips or long, seasonal trails. Telecommunications are limited, while healthcare is woefully inadequate for high-altitude emergencies such as altitude sickness, hypothermia, or accidents. This lack of basic infrastructure not only puts travelers at risk but also deters a broader spectrum of tourists, particularly those with limited time or physical ability.

Policy-level limitations compound these challenges. Nepal's Tourism Policy of 2008, although ambitious in scope, lacks dedicated focus on high-altitude tourism's unique opportunities and threats. Governance remains highly centralized, often sidelining local governments and indigenous communities who stand on the frontlines of both opportunity and vulnerability. Meanwhile, bureaucratic red tape surrounding permits, conservation fees, and regulations continues to obstruct growth. The voices of those most affected by tourism, local guides, farmers-turned-homestay hosts, and conservation stewards, are often drowned in top-down policymaking. Environmental degradation adds urgency to these concerns. The Everest region alone receives tens of thousands of visitors each year, resulting in solid waste accumulation, trail erosion, and unsustainable carbon footprints. The very ecosystems that draw travelers are buckling under the pressure of overcrowding and mismanagement. And then there's the looming shadow of climate change. Melting glaciers, erratic monsoons,



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and increasingly frequent landslides are destabilizing already fragile mountain ecosystems. In such a volatile context, short-term interventions are insufficient. What Nepal's mountain tourism requires is not more visitors but more vision.

A Path Toward Regenerative and Inclusive Tourism

The way forward must be rooted in a multidimensional transformation bold, inclusive, and sustainable. Nepal needs a comprehensive Mountain Tourism Policy, distinct from general tourism plans, that acknowledges the country's federal governance system. This policy should decentralize decision-making power, empowering local governments and mandating genuine community participation. Destination planning must become a cooperative process involving local cooperatives, conservation groups, indigenous voices, and youth-led initiatives.

Infrastructure investments must evolve beyond mere road construction. The country needs to focus on climate-resilient trekking trails, solar-powered eco-lodges, mobile health clinics, telemedicine, and sustainable waste management systems. Investments in reliable telecommunications would also allow digital nomads and researchers to access and share Nepal's hidden landscapes. These upgrades would not only improve the visitor experience but ensure the safety and dignity of both tourists and residents.

Equally important is the diversification of tourism beyond Everest and Annapurna. Nepal must spotlight lesser-known but culturally and ecologically rich destinations such as Tsum Valley, Dolpo, Kanchenjunga, Api-Saipal, and Rukum. These areas remain largely untapped, not because they lack beauty, but because they lack visibility, access, and investment. Promoting these regions can ease the environmental burden on overvisited areas and spread economic benefits to marginalized communities.

In line with global trends, Nepal must also pivot from volume to value. The future lies not in increasing tourist numbers but in deepening the quality of their experiences. "Slow tourism" which emphasizes mindfulness, cultural immersion, and ecological respect, offers the ideal path forward. Spiritual retreats, nature-based wellness experiences, cultural

homestays, and eco-volunteering projects are all viable alternatives to adrenaline-driven tourism. These offerings can attract high-value travelers who stay longer, spend more consciously, and leave deeper, more positive footprints.

Building Capacity and Cultivating Cultural Pride

Capacity building must become a cornerstone of tourism development. Local populations, especially women and youth must be equipped with training in hospitality, foreign languages, digital tools, first-aid, and environmental stewardship. Digital marketing skills, for instance, can empower rural entrepreneurs to promote their homestays and cultural offerings directly to global audiences.

Simultaneously, cultural preservation must not be treated as a side benefit but as a central pillar of sustainable tourism. Initiatives to revive oral traditions, restore heritage architecture, and protect sacred landscapes should receive both national and international backing. Visitors, too, must be educated on cultural sensitivity and ecological responsibility. This cultural exchange should be reciprocal: where travelers gain insight and humility, and host communities gain recognition and pride.

Ultimately, mountain tourism in Nepal must be reimagined not as an extractive industry, but as a regenerative one, one where every journey uplifts the land, empowers the people, and celebrates the culture. This requires a radical shift in how we conceptualize tourism: from transactional to transformational, from centralized to localized, and from growth-centric to resilience-driven.

Toward a Higher Purpose

Nepal's mountains have always inspired awe, symbols of aspiration and inner ascent. But they also embody responsibility. In their majestic silence, they challenge us to rise not just in altitude, but in attitude.

The path forward for Nepal is not about building more hotels or charting more trekking routes. It is about crafting a tourism model as elevated, enduring, and ethical as the Himalayas themselves, one that meets the future with grace, vision, and care.

“सपना जापानको, साथ हानामीको
नेपालमा पनि, जापानमा पनि”



Study in

JAPAN

जापानिज भाषा



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ट्रेक दुर्घटनाले ठुलो क्षति निम्त्याउन सक्छ, समयमै ख्याल गरौं ।

कानुनले तोकेभन्दा बढी भारवहन गर्नु/गराउनु अवैध कार्य हो, यस्तो कार्य गर्ने गराउनेले सजायको भागिदार हुनुपर्छ ।

सवारी निर्माता कम्पनीले सिफारिस गरेको भन्दा बढी भारवहन नगरौं ।

निर्धारित भाडादरको कार्यन्वयन कसैको निगाहा होइन, ट्रेक व्यवसायीहरूको अधिकार हो ।

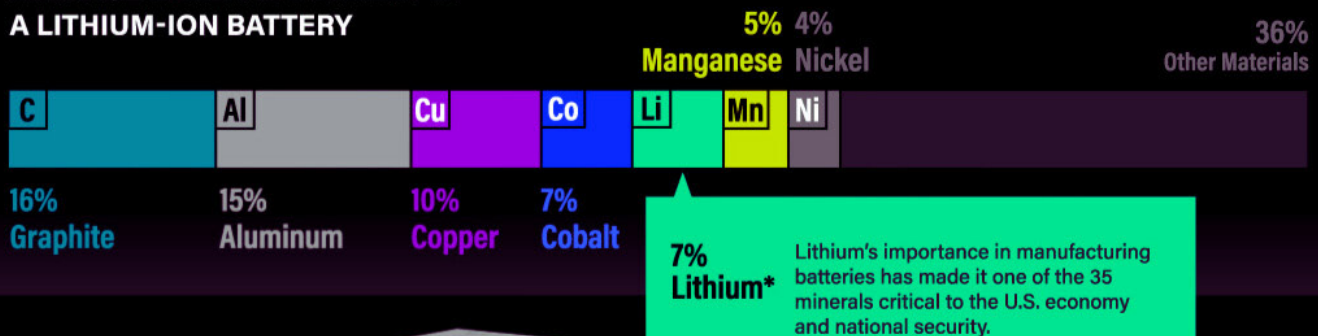
जथाभावी सडक प्रयोग नगरौं, ट्राफिक नियमको पूर्णरूपमा पालना गरौं ।

बीमा र संस्थागत सदस्यताको समयसीमा बारेको जानकारीलाई अव्यावधिक गराईराखौं ।

नेपाल ट्रेक यातायात व्यवसायी महासंघ

PEERING INSIDE A LITHIUM-ION BATTERY

AVERAGE MINERAL CONTENT OF A LITHIUM-ION BATTERY



Key Minerals
Involved in
Construction

C
Anode

The battery's negative electrode attracts positively charged ions, enabling the battery to hold a charge.

Replacing today's standard Carbon Graphite anode with a thin layer of pure lithium metal can 2x the energy density of rechargeable batteries.

Cu Al
Current Collectors

Collects the current being fed into the cell during charging and channels the battery's energy toward a device when the battery is discharged.

Separator

Physical separation layer to prevent the anode and cathode from touching. In a solid-state battery, the separator and liquid electrolyte can be replaced by a solid-state electrolyte.

Ni Mn Co Li
Cathode

The positively charged electrode attracts negatively charged ions, allowing the battery to discharge electricity.

Lithium Ions

Lithium is the common denominator in all batteries and, therefore, the namesake of Lithium-Ion Batteries.

Lithium transfers a positive charge between the anode and cathode to store energy in the battery.

Electrolyte

A medium that allows for Lithium-ions to flow between the anode and the cathode, enabling electrochemical energy storage.

*Refers to lithium carbon equivalent (LCE) where 1g of lithium equals 5.17g of LCE

Sources: EnergyX, McKinsey & Company, Volkswagen, MIT Technology Review, Sciencedirect.com, USGS



Cricket: Nepal's New Engine of Growth

Sports in Nepal have always held emotional value. For decades, football and cricket stood out as the most loved games. In fact, football once had a stronger hold on the hearts of Nepali fans. Stadiums used to echo with cheers for local leagues, and footballers were once widely admired across the country. Cricket, on the other hand, stayed in the background for years.

But over time, football faced some setbacks. Unseen political influence, inconsistent leadership, and a lack of long-term planning for player development caused its popularity to slowly fade. Meanwhile, cricket kept moving forward steadily and silently. However, with growing youth participation, local tournaments, and players like Paras Khadka stepping up, cricket started to take center stage.

The real breakthrough came in 2014 when Nepal qualified for the ICC T20 World Cup. That moment changed

everything. Cricket suddenly became more than just a sport; it became a symbol of national pride. Youngsters who once looked up to football stars now began dreaming of wearing the national cricket team jersey. The team's performance, even though Nepal was a newcomer, won hearts of cricket fans globally.

This momentum helped cricket build a stronger foundation. Even when the Cricket Association of Nepal (CAN) went through a crisis and faced suspension. There was a time where there was administrative instability, lack of infrastructure and limited opportunities made it difficult for players to see a future. But things began to change. The fans never gave up. And that loyalty was recognized globally when Nepali cricket fans were awarded "Best Fans" back-to-back by the International Cricket Council (ICC). It was proof that Nepal's cricket culture had found deep roots in Nepal.



Room packed stadiums to sold-out jerseys, cricket in Nepal is no longer just a sport but it's a booming economic force, driving passion, pride, and profit across the nation

Nepal's consistent performance in international tournaments has also helped. From winning home series to competing in Asia Cup qualifiers and World Cup qualifiers, Nepal's cricket team has kept fans engaged and hopeful. These achievements have led to increased investment, both from the government and private sector, further strengthening the sport's revival.

The current situation of cricket in Nepal is promising. In recent years, these domestic leagues have seen rapid growth. Stadiums like TU Cricket Ground in Kirtipur are filled during matches. With the growth of tournaments like the Nepal Premier League (NPL), cricket has taken a professional turn. The excitement around the game is reflected in how fans are willing to pay for tickets and attend matches in huge numbers. During international matches and NPL games, the TU Cricket Ground in Kirtipur gets packed with fans, creating a lively atmosphere that matches international standards.

From packed stadiums to sold-out jerseys, cricket in Nepal is becoming a driving force for both passion and profit. The craze for the game is clearly visible as fans not only fill the stands but also invest in merchandise like team jerseys, caps and other branded items that often sell out due to high demand. This growing fanbase has turned cricket into a rising business opportunity, opening doors for economic growth through ticket sales, local and international tourism, and a booming merchandise market. What was once just



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a game is now fueling a new wave of economic activity in the country.

The rise of cricket in Nepal has sparked a growing demand for better infrastructure, with modern stadiums and regional facilities becoming essential to support local leagues and national events. This development goes far beyond the game itself, creating jobs in construction, hospitality, maintenance and transportation. A prime example is the ongoing construction of the Mulpani Cricket Stadium, which not only aims to host international matches but also boosts local employment and tourism.

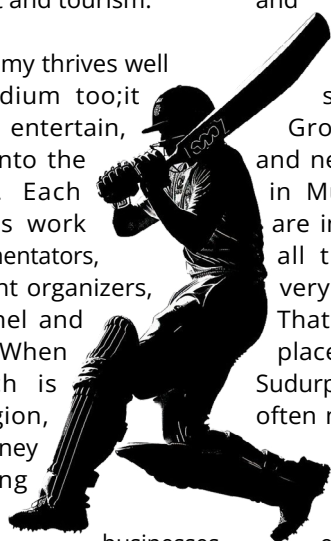
The cricket economy thrives well outside the stadium too; it does more than entertain, it breathes life into the local economy. Each match generates work for coaches, commentators, cameramen, event organizers, security personnel and medical teams. When a cricket match is hosted in a region, visitors spend money on food, lodging and transport, helping small businesses grow and thrive. At the same time, sport creates indirect jobs in the media, event management, security and more. Even small businesses like food vendors, ride-sharing drivers and hotels see a surge in income during

tournaments. On top of that, the digital space has opened new doors for content creators producing vlogs, reels and match updates, turning cricket into a vibrant ecosystem.

One of the biggest challenges holding back cricket from becoming a strong and lasting industry in Nepal is the lack of proper infrastructure. The love for the game is spreading across the country, but the support system to match that excitement just isn't there yet. We don't have enough quality grounds, coaching centers, or training facilities where young players can grow and improve.

There have been some good steps taken. The TU Cricket Ground has been renovated, and new stadiums have been built in Mulpani and Pokhara. These are important developments. But all three are located inside or very close to Kathmandu Valley. That means young players from places like Province 1, Karnali or Sudurpashchim are left behind. They often must travel far from home or miss out completely because there's nothing nearby. This creates an unfair gap. Talent exists in every corner of Nepal, but without access, those young dreams often go unnoticed. It's not just their loss. The entire country misses out on what could have been our next big cricket stars.

To truly grow cricket and make it inclusive, we need to spread opportunities beyond the Valley. That means setting up regional academies, organizing school and college-level tournaments in every province, and creating local leagues that give players a real chance to shine. Imagine a young cricketer in Surkhet or Dhangadhi getting the same support and exposure as someone in Kathmandu. That's the kind of change Nepal needs. Cricket isn't just for cities. The passion for the game lives in villages and towns too. Now it's time we bring the infrastructure closer to the people who love sport the most. Nepal stands at a thrilling point in its cricketing journey, where the sport is transforming from a national passion into a powerful driver of economic growth. With smart investment in infrastructure, promotion and good governance, cricket has the potential to become one of Nepal's leading industries. Beyond entertainment, it unites people, fuels national pride and opens doors for opportunities through ticket sales, merchandise, job creation and tourism. Cricket empowers communities and inspires dreams, offering a clear path toward economic progress. If Nepal continues this track with focus and collaboration, cricket could soon become a major pillar of the nation's modern economy



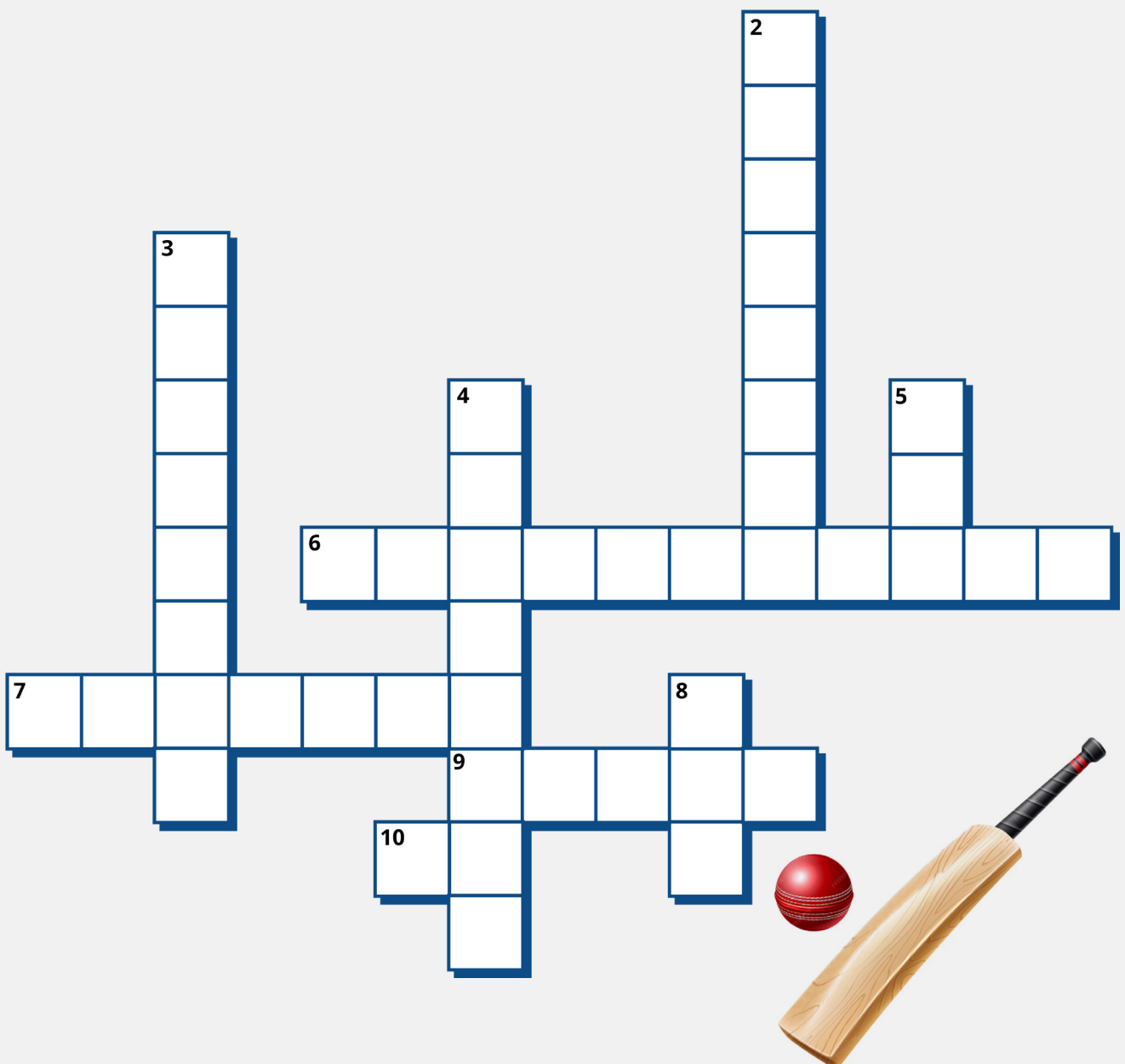
SOLVE THE CROSSWORD PUZZLE!

Down:

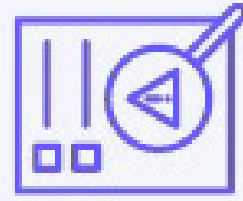
1. Awarded to Nepali fans by the ICC
2. The sport that once dominated over cricket in Nepal
3. City where TU Cricket Ground is located
4. The growing cricket league in Nepal
5. The cricket governing body in Nepal

Across:

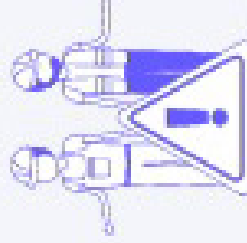
1. Nepal's first major international breakthrough came in the 120 World Cup.
2. An economic impact of cricket
3. Newly developing cricket stadium at the boarder of Kathmandu
4. Legendary Nepali cricketer and former captain
5. The cricket stadium located in Kirtipur



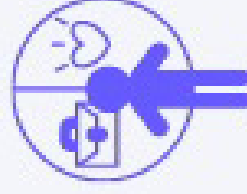
Occupational Health and Safety



Risk Assessment



Injury Prevention



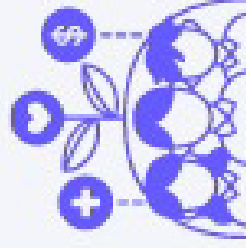
Work-life Balance



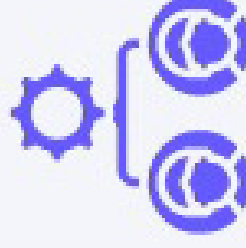
Safety Protocols



Workplace Hazards



Compensation and Benefits



Employee Management



How health impacts industrialization?

Apparently, there may not be a visible impact of health on industrialization. Nevertheless, there are many ways in which health can have strong correlation, if we dig it deeper down.

First and foremost, industrialization needs human resources, moreover with healthy minds. Likewise ill employees and labor workers cannot perform well, thus by increasing absenteeism. The higher the health status, the higher the performance alongside the lower the expenses of that company. This is the reason factory workers and employees will have to have health insurance coverage both as a part of social security and as a strategy of financial compensation.

In the same way, if any co-worker carries any infections and communicable disease, that might click cascade

of transmission of the disease among many co-workers. The COVID-19 pandemic has left a very bad kick to the factories, production, transport and many economic domains. The whole economy was funneled towards disease care, hospitals and the health side. Only few pharma sectors and vaccine manufacturing were benefitted which is a peanut in terms of whole industrial circumference.

While flipping the correlation, industrialization is closely connected with the health domain. Equipment innovation and manufacturing is an inevitable component in healthcare. Be it X-Ray, USG, MRI, CT, Endoscopy and OT light, all have their own praiseworthy role in the health side. These days the IT sector including AI, blockchain, IOT and



*Industrialization
fuels medical
innovation,
from AI-driven
diagnostics
to life-saving
equipment,
yet unchecked
pollution and
workplace
hazards threaten
to reverse those
very health gains*

emerging technologies have added marked value in making healthcare more efficient and coordinated. In other ways round, big factories create many hazards by products and air pollutants like carbon dioxide, Sulphur dioxide, and radiation material as well as river pollutants like organic metals, pathogens and so on. These adverse parts of industrialization badly hit public health and well-being.

There is a big issue of migrant workers' health emerging as a new chapter in the health sector. Lack of caring family members in the due course of migrating to industrial countries has created an alarming situation, halting timely care particularly in family health emergencies. Additionally, the absence of strong knowledge of ergonomics has caused a rapid upsurge of industry specific health conditions.

In connection with industry and production perspective, the pharmaceutical industry is an ever rising field globally reflected by projected size of 2400 billion USD in 2030 from 1800 billion USD in 2024. Similarly, Nepal is also entertaining a significant increment in Pharma production of 9000 crore rupees inside the country that covers nearly 80% of the national consumption. Seemingly, we can think of export promotion rather than only import substitution in this area. Subsequently, the global market cap of medical machinery and equipment will leapfrog to 850 billion USD by 2030 from 650 billion USD as of 2024. Per se, Nepal is very much lagging in this sub domain of the health industry. In the same fashion, Nepal can take proactive steps in other medical consumables,



Dr. Subash Pyakurel
Founder: Health Concern

prosthetics, biotech products, and 3D printing industry.

Another unseen and untapped area could be innovative idea call and incubation targeting a global scenario. Who knows if a student from a remote part of the country may not come up with river-cleaning equipment, and who knows if a student from industrial engineering may not cater to new technology in the air-filtration sector? The students' organizations like SOIES Nepal can organize hackathons and idea camps to build nanobots, humanoids and robotics for the health sector. In this article, challenges have not been covered as the writer believes that every single problem is capable of clicking a solution. And every single solution might show multiples of challenges alongside. In the long run, those unpredicted challenges may, in turn, be the pavement for few more unprecedented solutions or opportunities.

In conclusion, health and industrialization have two ways of correlating, leaving positive impacts most of the time. However, the small chance of adverse impacts cannot be undermined as well.

MENTAL HEALTH AT WORK

According to the CDC, 18.3% of Americans reported suffering from mental illness in 2016 (or 44.7 million people).

Improving the support systems in the workplace is crucial as many people spend most of their time at work.

HOW MENTAL HEALTH AFFECTS WORK

Reduced ability to perform
Increased stress levels
Decreasing motivation
Affected relationship with colleagues

WORKPLACE POLICIES NEED TO INCLUDE TRAINING & IMPROVED SUPPORT STRUCTURES

Training program for managers & staff
Allow for flexibility
Improve communication
Structures to foster guidance



From Neglect to Renewal: The Revival of Government Healthcare

Reviving Governmental Hospitals of Nepal

A Sustainable Approach to Public Health and National Progress

Introduction

Nepal's governmental hospitals have long served as lifelines for millions of citizens. However, years of chronic underfunding, neglected infrastructure, and administrative inefficiency have pushed these vital institutions into crisis. In a country where public hospitals are often the only accessible healthcare option for rural and economically disadvantaged populations, their decline represents more than a health crisis, it signifies a national development concern.

Reviving these hospitals is not simply a health sector reform; it is an economic, social, and ethical imperative. Robust public healthcare forms the backbone of any resilient society, and Nepal's pursuit of industrial progress must be built upon a healthy population.

Current Challenges in Nepal's Government Hospitals

A significant portion of Nepal's public hospitals, including Bir Hospital and Tribhuvan University Teaching Hospital, struggle to meet even basic standards. The Nepal Health Facility Survey 2021 reports that only 42% of public hospitals satisfy essential infrastructure criteria, and a mere 27% consistently stock necessary medicines. Aging infrastructure, outdated equipment, overcrowding, and an acute shortage of skilled personnel worsen patient outcomes.

The COVID-19 pandemic exposed these vulnerabilities. Shortages of ICU beds, oxygen, and basic protective equipment highlighted systemic flaws, while private hospitals flourished but remained unaffordable for most.



*When hospitals
revive, lifelines
are restored and
a nation breathes
anew.*

Importance of Reviving Government Hospitals

The revival of government hospitals is essential for several reasons:

1. Equitable Access:

Public hospitals are often the only accessible healthcare providers for rural populations. Without revival, millions remain underserved.

2. Economic Protection:

Affordable public healthcare protects citizens from catastrophic out-of-pocket expenses, reducing poverty and financial strain.

3. Public Health Security:

Strengthened hospitals bolster national resilience against pandemics and disasters.

4. Social Equity and Justice:

A strong public healthcare system embodies the principle of healthcare as a human right.

Framework for Sustainable Revival

Green Infrastructure:

Incorporating energy-efficient designs, solar panels, and rainwater harvesting systems can reduce both cost and carbon footprint. Dhulikhel Hospital, for example, has implemented solar backup systems, proving the viability of eco-healthcare models.

Digital Transformation:

Digital health systems like the Hospital Management Information System (HMIS) can streamline operations and improve patient experience. Although introduced through Nepal's e-Health Strategy (2017–2021), implementation remains uneven.

Workforce Empowerment:

Skilled health professionals are leaving for better prospects abroad. To reverse this, the government



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Batch of 2078, Bachelor's in Industrial Engineering
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must ensure better pay, training, and working conditions to retain talent.

Nepal must tap into Public-Private Partnerships (PPPs) to modernize its hospitals while ensuring affordability. India and Thailand have leveraged PPPs to enhance diagnostics and telemedicine. A localized model could ease Nepal's resource constraints while maintaining public ownership.

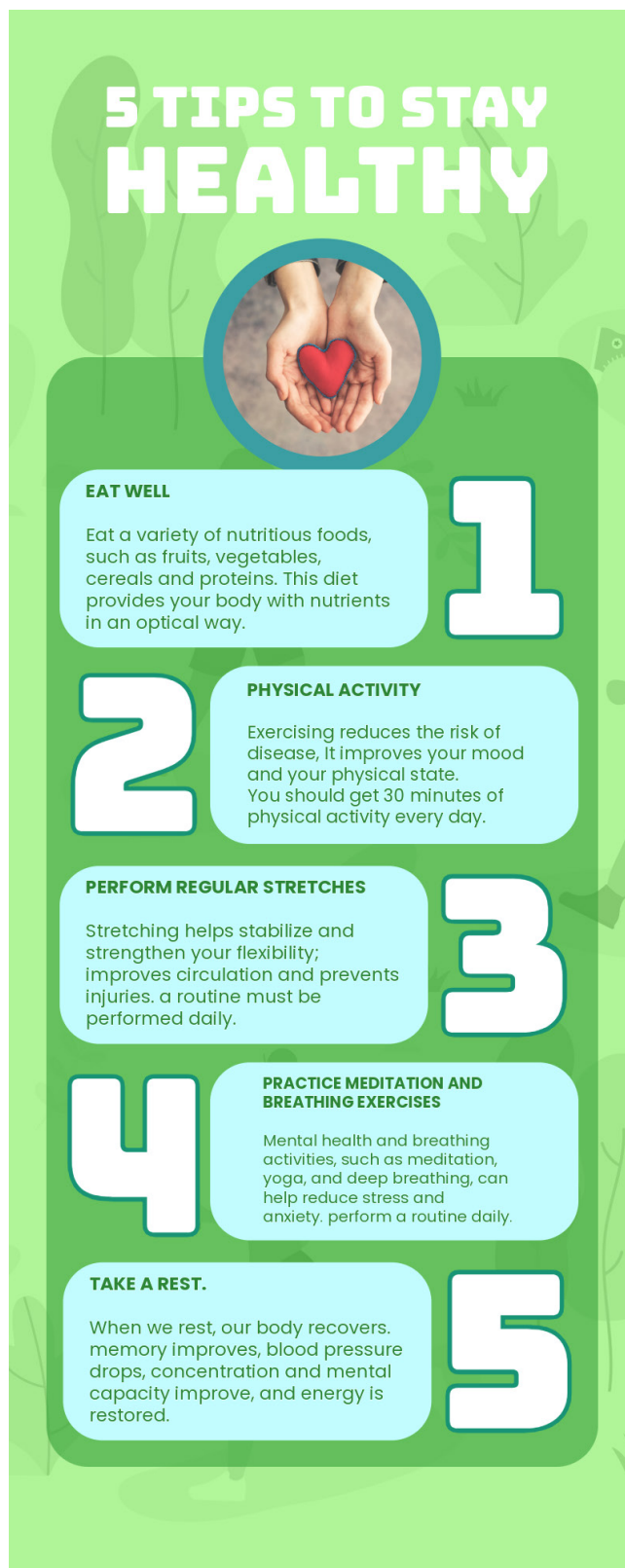
Case Study: Dhulikhel Hospital - A Model for Sustainable Healthcare

Dhulikhel Hospital, affiliated with Kathmandu University, stands as a powerful example of what a sustainably revived hospital can look like in Nepal. Though not a government hospital, its operational model offers valuable lessons for the public sector. Located in Kavrepalanchok, the hospital has successfully integrated renewable energy systems, most notably solar power for electricity and heating into its core infrastructure.

It also emphasizes preventive care, community outreach, and equitable access regardless of patients' financial status. Its decentralized governance model allows swift decision-making, while partnerships with international donors and academic institutions support its continued innovation. This kind of hybrid, locally grounded yet globally connected model could inspire the transformation of government hospitals across the country.

Conclusion

In conclusion, the revival of Nepal's government hospitals is not merely a sector-specific intervention- it is a national imperative that intersects public health, economic resilience, and social equity. As millions of Nepalese depend on public hospitals for essential care, strengthening these institutions means safeguarding both lives and livelihoods. A sustainable revival must extend beyond infrastructure to embrace digital transformation, environmental responsibility, empowered healthcare professionals, decentralized governance, and responsible public-private partnerships. Real-world examples like Dhulikhel Hospital prove that sustainable, community-focused, and technologically integrated healthcare is achievable in Nepal. By implementing strategic reforms and placing patients at the heart of every initiative, Nepal can transform its ailing public health infrastructure into a foundation for inclusive national progress. Ultimately, investing in government hospitals is not just about modernizing healthcare, it's about restoring dignity, hope, and opportunity to every Nepali citizen.



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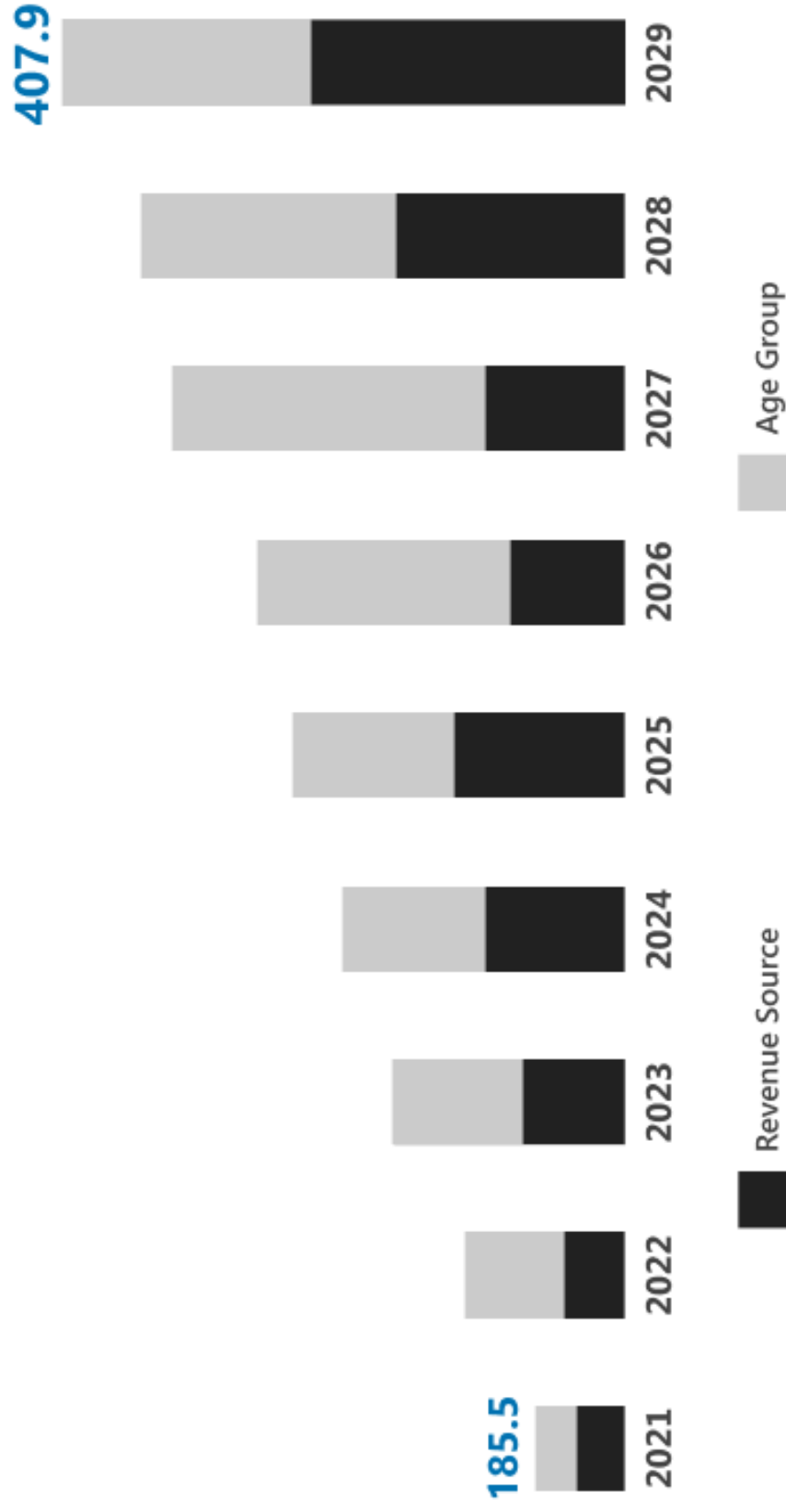
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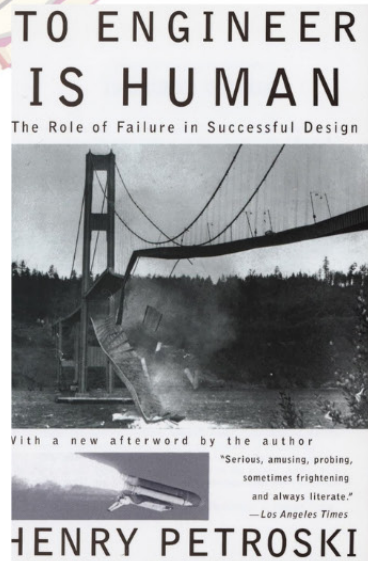
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Global Sports Events Market

Segmentation and projection till 2029 (USD Billion)

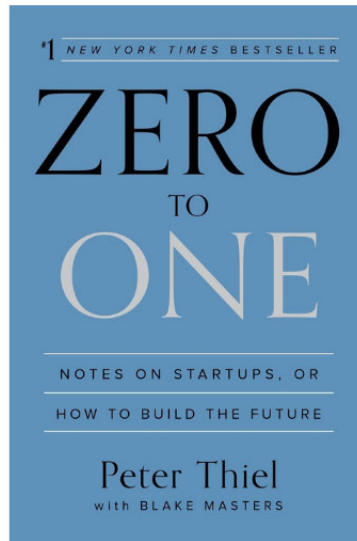


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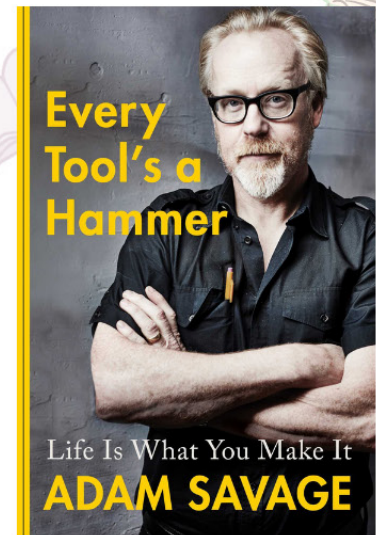
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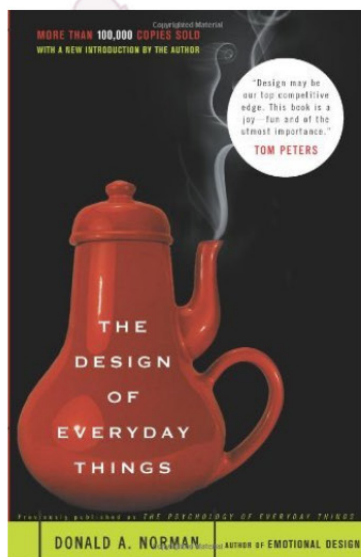
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Zero to One: Notes on
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Masters*



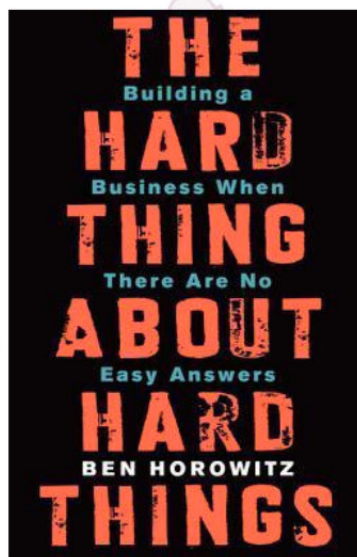
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Every Tool's a Hammer:
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Adam Savage



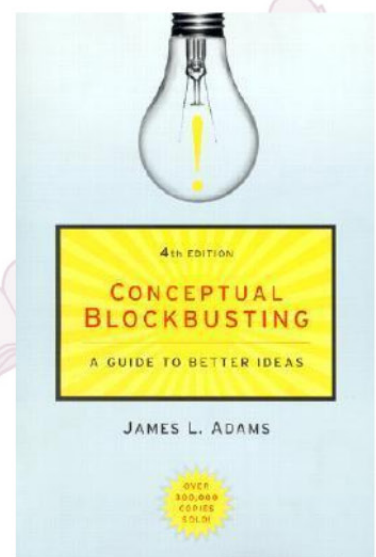
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★★★★★ 4.21

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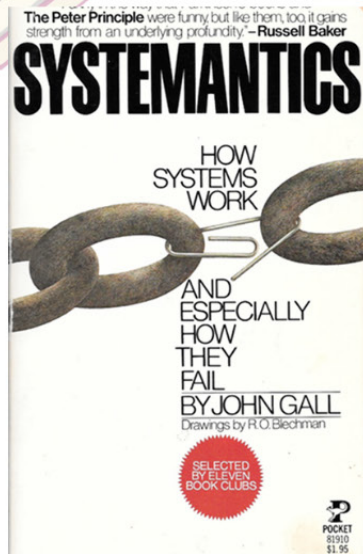
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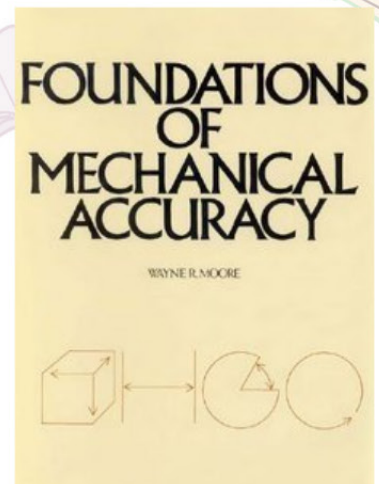
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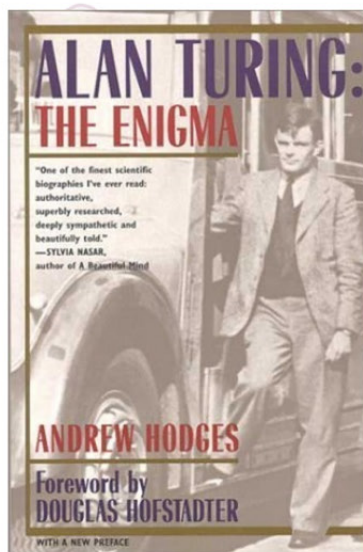
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Simon Winchester



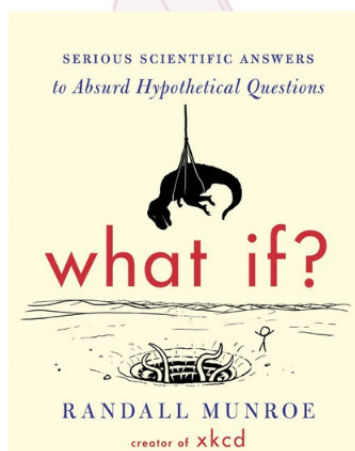
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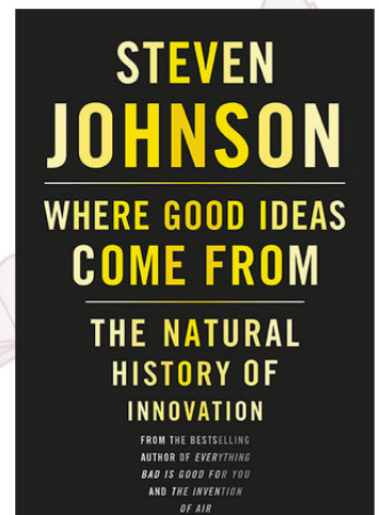
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उल्लेखित वृद्धि चालु आर्थिक वर्षको बजेटसँगको तुलनामा गरिएको हो ।

from: Nepal in Data



We Are Not Mechanical Engineers: We Want Our Identity

Walk into any classroom of the Department of Industrial Engineering, IOE Thapathali Campus and you'll see motivated students, learning fluid mechanics, heat transfer, material science, and engineering drawing. On the surface, the coursework might look identical to Mechanical Engineering and that's where the misunderstanding begins. But dig a little deeper, and you'll see a whole different story unfolding one of misplaced identity, unmet expectations, and an academic design that's brilliant in intention but confused in execution.

We are not mechanical engineers. Yet, ironically, that is what we are being trained and treated as.

Where the Confusion Starts?

Take a closer look at the Institute of Engineering (IOE) syllabus. In the first and second semesters, students walk a common path in basic

science, drawing, computing, and mathematics. But by the third semester, the road splits. Every engineering begins its technical deep and so does Mechanical Engineering as they dive into machine components and solid mechanics, while Industrial Engineering students are introduced to a different realm altogether economics, ergonomics, work study, and productivity analysis.

This shift is not accidental. Industrial Engineering is about understanding systems, flows, people, and processes. It's about seeing the factory not just as a machine-laden space, but as a living, breathing organism whose efficiency and sustainability depend on thoughtful design and continuous improvement.

We don't study Work Study because we are going to just operate lathe machines, we study it because we are trained to optimize those operations.



Engineers Make Things, Industrial Engineers Make Things Better. There is more to the system than just Machines, and we see that. Industrial Engineer (noun) Professional Problem Solver, solving problems no one else understands. Yes! We are Industrial Engineers!

We don't study ergonomics only to design chairs, we study it because we care about human-machine interaction, workforce well-being, and reducing fatigue in repetitive processes.

Over the semesters, our curriculum dives deep into Supply Chain Management, Concurrent and Value Engineering, Maintenance, Entrepreneurship Development, Operations Research, and Quality Assurance. We learn about Plant Layout, Occupational Health and Safety, and New Product Development.

We become systems thinkers.

We become analysts.

We become managers-in-the-making.

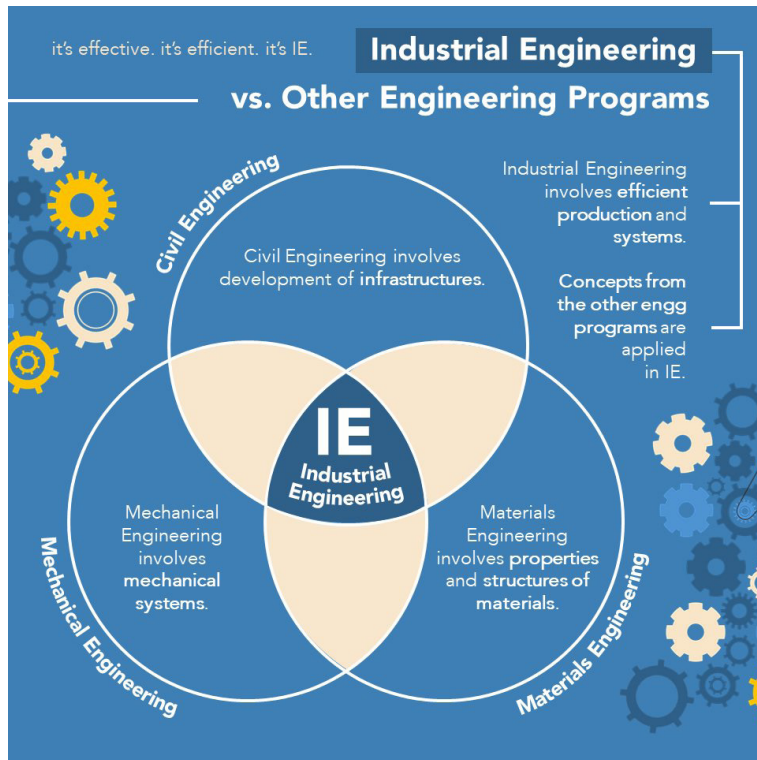
But despite this multidisciplinary and future-forward training, we are boxed into an identity that doesn't serve us. That's damaging.

Where Are We Really Expected to Go?

If you look closely at our training, the purpose is clear. We are not being built to operate machines, we are being built to design workflows. We are being prepared to be the interface between engineering and management, the people who can talk numbers in a boardroom and optimize bottlenecks on the shop floor.

But where do we go?

In most companies of Nepal, our designation doesn't exist. We are either treated as generic engineers or forced to label ourselves mechanical just to get a job. Most industries, large or small do not even know that Industrial Engineers are being produced in Nepal. And when they need someone to streamline their



But how will industries ever know what we do if we ourselves are confused about our identity? If our department, government, and even alumni refer to us as “semi-mechanical”?

The time has come to define who we are loudly, proudly, and clearly.

We are Industrial Engineers.

We are the people who:

- Cut unnecessary costs without cutting corners.
- Reduce time and increase productivity.
- Manage both machines and people, because we understand both.
- Can be project managers, factory heads, startup founders, or supply chain leads.

But for that to happen, we need support, from academia, from industry, and from government. We need job roles that recognize us, policy changes that include us, and a department that advocates for us.

If you are reading this and still wondering what makes Industrial Engineering different, here's your answer:

Industrial Engineering is about making everything work better with machines, people, systems, and organizations.

- We are not mechanical engineers.
- We are not business graduates.
- We are the link between them.
- We are Industrial Engineers.

operations, they hire consultants from abroad doing exactly what we are trained to do.

Even government agencies are unaware or uninterested. But why?

In my point of view, when the program was introduced, it was granted equivalence to Mechanical Engineering perhaps out of necessity, to survive in a market that didn't yet understand the value of Industrial Engineering. The difference between the two has only become clearer with time. While Mechanical Engineers go deeper into core design, material science, and machine design, we pivot into operations, economics, systems thinking, and process management. Equivalency was a survival strategy. Today, it's a limitation.

We Are the Engineers Nepal Needs Most

In the context of Nepal's underperforming industrial landscape, we are the exact breed of engineers the country desperately needs.

- To revive closed industries like Gorakhkali Rubber or Janakpur Cigarette Factory, you don't just need mechanical fixes, you need strategic, process-oriented revival.
- To reduce wasteful practices in manufacturing plants, you need lean thinkers, not just tool handlers.
- To improve supply chains, reduce costs, increase quality, and maintain safety standards, you need people trained in systems optimization, you need us.

And its high time Nepal knew who we are.



नेपाल सरकार
राष्ट्रिय योजना आयोग
सिंहदरबार, काठमाडौं



Rajan Poudel

Joint Secretary, Government
of Nepal, National Planning
Commission



The world is turning global, and with that, so is the competition. Keep the global competition in mind and be the best version of yourself as a player in the international market, representing Nepal.

1. How does the NPC identify unique local potentials such as tourism, industry, or agriculture across different regions of Nepal, and what is the planning structure to integrate them into national-level development policies and projects?

NPC works in coordination with multiple Ministries of Nepal while designing and implementing any plans. For example, the Ministry of Industry's projects often relate to other ministries, such as the Ministry of Food, the Ministry of Agriculture and Livestock, and any work it does requires coordination between them. Considering that Agriculture is still the main source of livelihood in our country, this sector carries immense weight and importance. Given that fact alone, various plans such as the currently running Sixteenth Plan are prevalent in helping these sectors grow. Growth in Agriculture helps increase Production as Agriculture provides industries with their raw materials. And importing these raw materials by itself isn't sustainable. Hence, NPC integrates all the unique local potentials into development policies and projects through collaboration and coordination with multiple governmental Ministries, focusing on plans and projects with high production and job generation.

2. Many large-scale industries that once significantly contributed to GDP and the national economy, like Gorakhkali Rubber and Janakpur Churot, are now defunct. What policy roadmap exists for reviving or replacing such strategic industries?

Yes, many industries have become defunct. Adding to the list of the ones you mentioned would be the Cement industry in Udhaya Pur and Hetauda, or even the Clothing Industry in Hetauda. One of the key challenges these industries face is that they cannot compete with other globally run corporations in price, quality of production, or market value. The bag of cement sold by Udhayapur Cement costs Rs 900, while competing brands cost about Rs 600 to Rs 700. With alternatives like that, it's no wonder difficult for these companies to maintain their place in the market. Our nation is quite poor, so it will be unreasonable for us to be investing in industries like these which are comparatively risky with our limited budget, still the government is putting a lot of focus on Privatising the industries in coordination with the Finance Ministry to keep them afloat and only planning to invest in industries that will yield high amount of profit

and heavy production capacity. These are the few strategic decisions being made to revive these defunct industries.

3. What are the key reasons, according to NPC, that industries in Nepal often fail to sustain beyond the startup phase, and how is the government addressing those gaps?

In Dhankuta, there is an industry with high capacity for the production of juice from the Bel fruit. For about Rs 100, we can produce nutritious juice that compares with supplements costing thousands of dollars. However, despite all this, we haven't been able to sell as many products simply because people don't purchase them as a superior choice. This is where the dark side of globalization comes into play. The market has been dominated by large-scale global industries such as Coca-Cola, making it harder for local ones to establish themselves and their products solidly. And to tackle this, Subsidization has become one of the solutions. The government even allows these small-scale industries to take loans with only 2% interest, with just the project proposal as collateral. We are also ensuring grants are carefully provided to startups for innovations so that new projects are supported and encouraged with a proper yield of profit.

4. Is there a possibility of the NPC suggesting policies that would help us favor Nepal's products over products from abroad?

Nepal is a member of the World Trade Organization and has signed the Most-Favored-Nation (MFN) agreement. This ensures that the products of our nation are allowed to compete in the international market without any prejudice, even in terms of their quality. Therefore, we too are not allowed to set any rules that would create unfair competition for other member nations' products.

Instead, we can, however, help promote the products of our nation more to give it more visibility. Another option is the possibility of increasing Cogeneration practices, similar to how the Sugar industry also generates electricity. We could also extend that to the generation of things like fuel from Molasses. These are the few ways we could increase the industry's capacity in Nepal.

6. With recent climate-induced disasters like the Rasuwa flood, how is the NPC integrating disaster risk reduction and resilient infrastructure into national planning?

Nepal was severely lacking in disaster preparedness before the earthquake of 2072 B.S. This lack of preparedness and delayed reaction caused high losses and tragedies. Compare this to how Indonesia handled a similar scale of earthquake, resulting in minimal casualties. Now, however, we are seeing several attempts to increase our preparedness as the Natural Calamity Act was recently replaced by the Disaster Risk Reduction and Management Act.

And though having emergency engineers and emergency planning is not a trend in Nepal, we have been making efforts to encourage disaster training if 100 people are working in the same place and making doing so a compulsion. On top of that, providing and teaching occupational safety, Working Environment Maintenance has also been slowly integrated to decrease the casualties as well as increase

the life span of many machineries which degrade faster in warmer climates, such as batteries of Jumla area lasting more than that of one running in the Nepalgunj region by three times as much.

7. Is NPC planning any collaborations with universities or tech hubs for research and innovation in industrial development? If it exists, where?

Our country, unfortunately, is heavily lacking in terms of research, and as the world has moved to the 5th generation of industrialization, most of our industries are still stuck in the 2nd or 3rd generation, and our professionals are still learning the same outdated technology and later implementing it in the workplace. Therefore, to make a difference, we are currently working to upgrade our industries to 4th generation, which would allow us to replace petrol and diesel engines with electrically powered ones that would be more favorable to our nation.

In terms of innovation, introducing automation alone would increase the productivity of many of our industries, finally making production prices affordable and letting the product have the capacity to compete against its bigger competitors. Machine-generated products will also most definitely garner trust in quality by our consumers, as the quality is stabilized through automation. Hence, though there is a lack of research, we are conducting a few studies on our terms for industrial development. And while we can not help the students get information in the applied science aspect completely, we can help them learn more about the policies if interested.

8. What soft-power strategies does the NPC or the government have to attract the Nepali diaspora and promote brain gain?

We are at a time in life where saying that the love for your nation should be enough to stay and do something here is simply put, not enough. As ideal as that statement sounds, it isn't practical, and there should be something that would give the youth hope that they can do something in our nation. So what are we doing about this? First, let's talk about the per capita income of our country, which is about Rs. 2400 on average. With this amount, many people are still making sure that their lives are at least lived comfortably. But imagine the jump in standard if we were able to increase it up to 12 thousand. This is the government's goal for when we reach 2100 B.S.

Currently, being a busser in America has made it possible to live a decent lifestyle, but it's not the same when doing similar jobs in Nepal. If we can crack that barrier here, then that too would be more encouraging for the youth. Overall, there is also the fact that if we can increase the productivity of the agriculture industry, the production industry, and the service sector, we can not only someday increase the per capita income but also decrease brain drain.

9. Will NPC consider innovative yet practical ideas, such as an 'Idea Bank,' to capture local-level innovation and contribute to national planning?

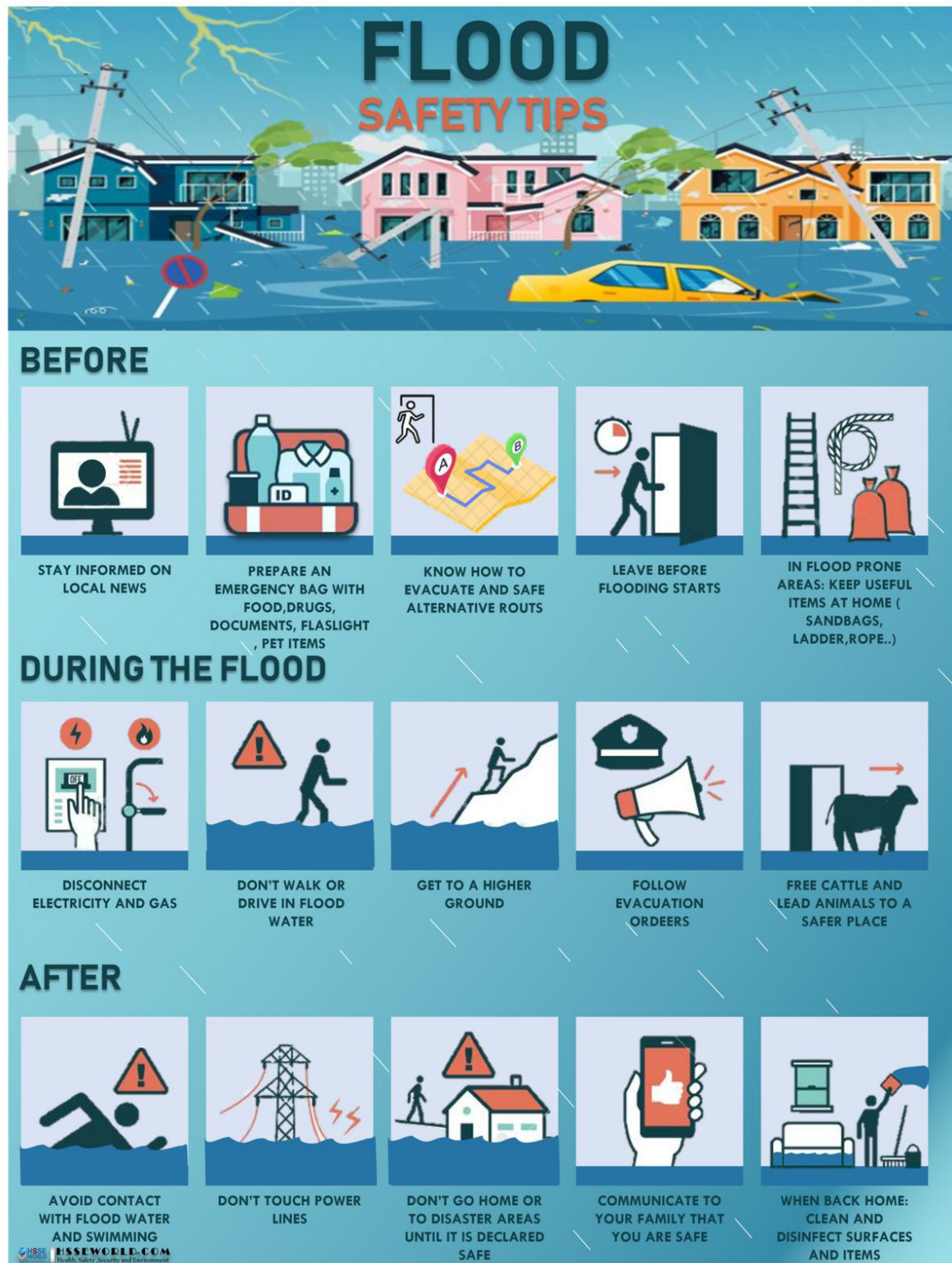
An innovation competition to encourage discoveries is conducted every year by the Ministry of Federal Affairs

and General Administration, and the winners are even rewarded according to their planning capacity. Our job is more focused on policy generation. Grants are also provided to new start-ups by the government for their business plans. Unfortunately, the grants are seldom used properly, as the youth still prefer going abroad for better opportunities. Though many who are back from foreign employment often do make good use of the funds provided.

the global network, so I truly hope there is a day when the engineers who are being made here are able to compete in the global market and make a name for themselves. We must truly increase competitiveness in our country to foster minds who will go forth to bring much change to the world as well. Keep the global competition in mind and be the best version of yourself as a player in the international market, representing Nepal.

10. Do you have any message for the Engineers? Or Industrial Engineers in general?

The world is turning global, and with that, so is the competition. Even if our country is small, it is now part of





From Industry 4.0 to Industry 5.0: Shaping the Future of Industrial Engineering?

The landscape of industry is undergoing a continuous and dynamic transformation, driven by relentless technological advancements and evolving societal demands (Silva et al., 2024). For a considerable period, the focus has been on Industry 4.0, a paradigm defined by its emphasis on digitalization, automation, and the integration of smart technologies (Cannavacciuolo et al., 2023). This era has fundamentally reshaped manufacturing and operations, promising unprecedented levels of efficiency and interconnectedness through cyber-physical systems, the Internet of Things, and artificial intelligence (Rashid & Kausik, 2024). However, as industrial systems grow more complex and global challenges become more pressing, a new vision is emerging: Industry 5.0. This evolution represents a crucial shift, extending beyond mere technological capability to prioritize human

well-being, environmental sustainability, and system resilience (Ghobakhloo et al., 2024). For Industrial Engineers, understanding this transition is not just academic; it is foundational to our ability to innovate and lead in the coming industrial age.

The Evolution: From Efficiency to Human-Centric Sustainability

Industry 4.0 largely championed the concept of smart factories, where machines communicate autonomously, data drives decision-making, and production processes are highly optimized for speed and cost-effectiveness (Shadravan & Parsaei, 2023). The core objective was to maximize efficiency and productivity through extensive automation and data exchange. Examples of Industry 4.0 in action include fully automated "lights-out" factories, where robots handle all production tasks with minimal human



By combining local knowledge with cutting-edge engineering, we're powering Nepal's future, one turbine at a time.

oversight, and predictive maintenance systems, where IoT sensors on machinery alert managers to potential failures before they happen, maximizing uptime. While immensely successful in these areas, a key realization has emerged: a purely technology-driven approach can sometimes overlook the vital role of human intelligence, the planet's finite resources, and the need for adaptable systems in the face of disruptions (Irshadullah Asim Mohammed, 2025).

Industry 5.0, in contrast, marks a significant paradigm shift by advocating for a human-centric and sustainable industrial future. While embracing the technological advancements of Industry 4.0, Industry 5.0 places paramount importance on the interaction between humans and intelligent machines, striving for collaborative robotics (cobots) where humans and robots work synergistically to enhance overall performance and job satisfaction (Islam et al., 2025). Moreover, it embeds sustainability at its core, moving beyond simply reducing negative impacts to actively designing processes that are environmentally friendly, resource-efficient, and contribute positively to ecological balance (Khan et al., 2025). Prime examples of Industry 5.0 include manufacturing environments where human workers perform tasks requiring dexterity and critical thinking alongside cobots that handle heavy lifting and repetitive motions, thereby improving ergonomics and safety. Another key example is the implementation of circular economy models, where products are designed for disassembly, allowing



Shristi Pandey

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components to be easily recovered, remanufactured, and reused, thus minimizing waste and conserving resources. This phase emphasizes the creation of resilient systems that can withstand shocks and foster a more equitable and valuable work environment for human operators.

While known for GPUs, NVIDIA is deeply invested in the underlying technologies that enable Industry 5.0. Their NVIDIA Omniverse platform is crucial for developing “digital twins” of entire factories, which can then be used to simulate and optimize human-robot collaboration and sustainable processes before they are implemented physically. Their NVIDIA Isaac platform focuses on humanoid robot technology and realistic simulations, facilitating the creation of robots capable of safe and effective human-robot collaboration a cornerstone of Industry 5.0.

A major player in industrial automation and digitalization, Siemens is actively integrating Industry 5.0 principles. They focus on digital twins not just for efficiency (Industry 4.0), but for enabling more resilient supply chains and optimizing processes to use environmentally friendly materials. Their work in additive manufacturing (3D printing) also contributes to sustainability by allowing for on-demand production and reduced waste. Siemens aims for significant carbon footprint reduction and energy efficiency in its own operations and through its solutions.

Industrial Engineers: Architects of the Future Industrial Landscape

As we transition into Industry 5.0, Industrial Engineers are uniquely positioned to serve as the architects of this future industrial landscape, leveraging our holistic approach to system design and optimization. Our expertise is critical in three key areas: the effective integration of humans and robots, achieving a vital balance between innovation and environmental responsibility, and the strategic enhancement of human talent.

Firstly, shaping the future demands a nuanced approach to automation, moving towards genuine human-robot collaboration. Industrial Engineers will be instrumental in designing workspaces and workflows where advanced robotics augment, rather than replace, human capabilities. This involves creating intuitive human-machine interfaces, optimizing collaborative tasks to leverage the strengths of both, and ensuring that automation leads to safer, more ergonomic, and more intellectually stimulating roles for human workers (Zafar et al., 2024). Secondly, the imperative to balance innovation with environmental stewardship falls squarely within our domain. We are tasked with developing circular economy models, implementing sustainable production processes, and designing supply chains that minimize waste and carbon footprint, ensuring that industrial advancement does not degrade our environment. This includes integrating renewable energy sources and promoting resource efficiency at every stage. Finally, Industry 5.0 fundamentally re-emphasizes the enhancement of human talent (Atay et al., 2025). Industrial Engineers will be at the forefront of designing training programs, fostering continuous learning environments, and optimizing job roles to unlock human creativity, problem-solving skills, and

adaptability. Inspired by the dynamic interplay between human ingenuity and technological prowess (as often depicted in forward-looking industrial visualizations), our role will be to ensure that technology empowers individuals, creating a workforce that is highly skilled, engaged, and capable of driving continuous improvement and innovation within a truly human-centric industrial ecosystem.

Fun Fact about Industry 5.0 Research:

Did you know that Industry 5.0 is sometimes described as “co-existing” with Industry 4.0 rather than completely replacing it? This means that much of the cutting-edge research isn’t about throwing away Industry 4.0’s advancements (like IoT or AI) but rather about re-orienting them. Researchers are actively exploring how to re-engineer these technologies to prioritize human well-being, environmental sustainability, and system resilience alongside efficiency, rather than just focusing on productivity alone. This shift is leading to fascinating developments in areas like intuitive human-machine interfaces, AI for circular economy models, and resilient system design against global disruptions.

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INDUSTRY REGISTRATION 2079/80

AGRO AND FORESTRY BASED

NO. OF INDUSTRY	TOTAL CAPITAL (Rs. in million)	NO. OF EMPLOYMENT
10	1678.26	599

CONSTRUCTION

NO. OF INDUSTRY	TOTAL CAPITAL (Rs. in million)	NO. OF EMPLOYMENT
1	133.18	40

ENERGY BASED

NO. OF INDUSTRY	TOTAL CAPITAL (Rs. in million)	NO. OF EMPLOYMENT
45	112682.20	2321

INFORMATION TECHNOLOGY

NO. OF INDUSTRY	TOTAL CAPITAL (Rs. in million)	NO. OF EMPLOYMENT
16	1072.40	896

MINERAL

NO. OF INDUSTRY	TOTAL CAPITAL (Rs. in million)	NO. OF EMPLOYMENT
4	764.76	173

MANUFACTURING

NO. OF INDUSTRY	TOTAL CAPITAL (Rs. in million)	NO. OF EMPLOYMENT
114	41957.80	10,102

SERVICE

NO. OF INDUSTRY	TOTAL CAPITAL (Rs. in million)	NO. OF EMPLOYMENT
66	30823.37	4199

TOURISM

NO. OF INDUSTRY	TOTAL CAPITAL (Rs. in million)	NO. OF EMPLOYMENT
67	25274.54	5037



*** Numbers were reported during Industry Registration**

Source: https://doind.gov.np/images/fis/2079-80-fiscal_vs_scale_n_category.pdf



Photo reference : globalpressjournal

Why Rural Nepal Needs a Real Industrial Push

Across Nepal's remote hills and rugged mountains, silent hands are still shaping the soul of the country. From blacksmiths hammering iron tools in Rolpa to mothers weaving Dhaka fabrics in Palpa to these crafts are more than livelihoods they're living heritage. Yet, year after year, they remain unnoticed in national development plans. The craftspeople, once central to local economies, are now sidelined, watching their children migrate abroad in search of better futures.

Nepal is often described as a land of natural beauty, but it's equally a land of untapped industrial skill, the skill that has been passed down generations. Sadly, without proper systems, these talents are fading. What Nepal lacks is not potential, but a structured pathway to support and industrialize its rural workforce.

As a student of industrial engineering, observing this contrast between potential and neglect is disheartening. Nepal's industrial development must not revolve only around cement factories, steel plants, or hydropower. The forgotten industries rooted in our rural landscapes also need to be seen as valuable parts of the national economy.

What's Really Happening?

According to the Economic Census 2018 published by the Central Bureau of Statistics (CBS), more than 923,000 business establishments exist in Nepal. Over half of them are small household-level industries, many of which are not even registered. In places like Karnali Province, nearly 80% of the economy is based on subsistence farming and small-scale activities like tailoring, weaving, blacksmithing, or food processing.



What Nepal lacks is not potential, but a structured pathway to support and industrialize its rural workforce

But these industries never grow. Why?

Because there's no clear roadmap. No training. No access to loans. No machines. No support from the government. They survive on tradition but can't expand. Youth leave for Gulf countries instead of continuing the family work. The knowledge remains but has no direction.

A Simple Example

In Rolpa, local blacksmiths used to supply tools to farmers and nearby towns. But now, cheap Indian tools have taken over the market. The local craftsmen don't know how to make better designs or market their tools. They're not trained. They don't have electricity regularly. So the next generation doesn't want to continue. That skill is dying. And this is just one example. In Bhojpur, the khukuri makers are still known worldwide. But many still work in basic sheds with no safety or training. In Jumla, locals collect herbs like Jatamasi and Timur, which are in high demand in India and China. But since they can't meet packaging or export standards, middlemen take all the profit.

In Rukum, women make traditional woolen clothes and blankets. These items are warm, durable, and locally popular. But there's no design upgrade, no branding, and no support for selling them outside the district.

These stories are not rare. They're everywhere. From food items to handmade tools, our rural industries exist, but they are forgotten in national planning.

The Vision: I don't want Nepal to become another place where villages are just for memories, and



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everyone lives in the city. I want our industrial growth to be local. Where each village has its own industry. Where local skills are trained, upgraded, and made market-ready. The boy in Jumla who knows about herbs should have access to proper training and equipment. The daughter of a blacksmith in Rolpa should have the opportunity to turn her father's skill into a business. The women in Sindhuli who make gundruk and pickles should be able to sell their products through digital platforms with modern packaging. This is possible. But it won't happen on its own. It needs effort, planning, and policy.

So, What's the Problem?

There is no proper Policy for Household or Village Industries

Our Industrial Policy 2019 mostly focuses on big or medium-scale industries. There is no dedicated policy that looks after village-based or household-level industries. As a result, these industries do not receive tax benefits, simplified registration, or government incentives.

No effective Training or Skill development programs

Most people working in these fields never get the chance to learn modern techniques. While the Council for Technical Education and Vocational Training (CTEVT) does offer some programs, they are not designed to suit rural industry needs. There is a major gap between what is taught and what is actually needed on the ground.

Markets Are Too Far: Digitally and Physically

Rural producers often sell only in local markets. They lack connections to bigger markets or online platforms. Only 35% of rural households have access to broadband internet. Without internet, digital payments, or logistic chains, even high-quality local goods can't reach cities. There is also no national-level online platform to sell local crafts.

Infrastructure is Weak

As per the Nepal Electricity Authority Annual Report 2022, about 15% of Karnali still lacks proper electricity. Internet and road connectivity are also poor in many hilly and mountain areas.

Without such basic facilities, industries cannot run efficiently or scale up

No Focus on Youth Entrepreneurship

There are grants and seed funds, but information doesn't reach rural youth. Even if it does, the application process is complex and time-consuming. A boy in Doti or a girl in Sankhuwasabha is unlikely to apply without guidance.

What Can Be Done?

Create a National Policy for Rural and Household Industries

- Identify major traditional industries in each province
- Offer tax holidays, micro-loans, and easier registration
- Make rural industry a part of national economic planning

Set Up Local Skill Training Centers

- Revamp CTEVT to offer village-specific skill courses
- Include basic finance, marketing, design, packaging, and digital tools

Develop a National Online Marketplace for Local Products

- Government and private sector can partner to build platforms where products from all 77 districts can be sold
- Link with logistics companies to improve delivery systems

Link Industry with Tourism

- Build "Craft Trails" and community tourism in villages known for crafts
- Example: Tourists visiting Upper Mustang could see yak wool being spun and buy directly

Promote One Village, One Product Model

- Like the successful model in Thailand, where each village specializes in one unique product
- In Nepal, Sindhuli could be known for Junar, Bhojpur for khukuri, Jumla for herbs, and so on

What If We Actually Move Forward?

If all levels of government, private sector leaders, academic institutions, students, and local entrepreneurs work in collaboration, the transformation could be historic. The rural heartlands of Nepal could become engines of sustainable economic growth. Here's what could realistically happen: Employment Generation at the Local Level: According to the Labour Force

Survey 2018/19, over 1.8 million Nepalis were unemployed or underemployed. Tapping into the skillsets in rural areas and channeling them into small-scale industries like traditional textile weaving in Palpa, handmade paper in Baglung, or herbal processing in Karnali could create thousands of jobs. These would not just be jobs, but dignified, skilled employment rooted in local culture.

Controlled Outmigration: In FY 2022/23, over 700,000 Nepalis left for foreign employment. Many left not by choice, but due to lack of alternatives. If we can promote localized industries with targeted subsidies, vocational training, and better access to capital, we can offer our youth a reason to stay, innovate, and grow within their own communities.

Reduced Dependence on Imports: Nepal imports a surprisingly high amount of basic processed goods from pickles and incense sticks to textiles and bamboo products. With the right support, many of these can be produced domestically using local raw materials and labor.

Revival of Dying Traditions: The art of Dhaka weaving, handmade iron tools, traditional pottery, and bamboo crafts is fading not because the skill is lost, but because markets, training, and innovation have not reached the makers. With the right platforms, these could become symbols of national pride and export-oriented industries.

What If We Continue to Overlook It?

If the same ignorance, centralization, and lack of vision persist, the consequences will be irreversible.

Generational Skills Will Vanish: Craftsmanship passed down for generations from blacksmithing in Rukum to yak wool processing in Manang is now on the brink of extinction. Without institutional documentation, support, and incentive, these skills will disappear silently.

Rural Areas Will Become Hollowed Out: Already, in many mountain districts like Dolpa and Mugu, entire villages have seasonal or permanent outmigration. If industries don't reach them soon, we'll see rural Nepal becoming increasingly empty socially, economically, and culturally.

Dependency on Foreign Goods Will

Escalate: Nepal currently runs a massive trade deficit, over NPR 1.6 trillion in FY 2022/23. Much of this is due to imports of items that can easily be produced in-country with local resources and skill. Ignoring this is not just a missed opportunity it is a national vulnerability.

Loss of Cultural and Industrial Identity: A country that imports even its cultural products, like traditional caps or incense sticks, risks losing its identity. Without homegrown industries to anchor our culture in the economy, Nepal's unique heritage may fade into mere memories.

Nepal is not lacking in potential. What it lacks is a system that connects that potential to opportunity. The problem isn't just in skill or effort. It's in systems. Policies are too generic and disconnected from ground realities. Programs are centralized. Infrastructure development is slow. Markets are inaccessible. Skills are not updated. And importantly, many of our efforts are short-term, fragmented, and donor-driven without long-term accountability.

CATCH-UP GROWTH

CAN NEPAL BE THE NEXT ASIAN SUCCESS STORY?

POOR COUNTRIES GROW FASTER THAN RICH COUNTRIES BY ADOPTING TECHNOLOGY, SHIFTING TO INDUSTRIES, AND INTEGRATING INTO GLOBAL MARKET

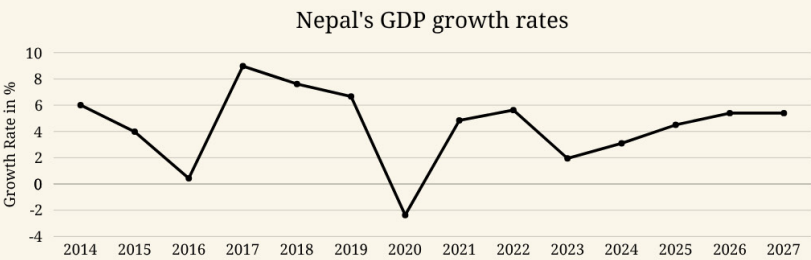


Poverty Reduction

Example:

- Indonesia: 58% → 17% poverty (1960–1990)
- Malaysia: 37% → <5% poverty

NEPAL'S CURRENT GROWTH



- 2014–2023 Avg: 4.3%
- 2017 Peak: 8.98%
- 2025–2027 Projection: 5.4%

NEPAL'S OPPORTUNITIES v/s BARRIERS

Oppertunities	Challanges
Location: Between India & China	Political Instability
Hydropower Potential	Weak Infrastructure
Growing service sector & outsourcing	Skills gap & Education problem
Demographic Divident (Young Workforce)	Over-reliance on Remmitance

Further Read:



Nepal Economic Forum

Final Year Industrial Projects : Batch 2077

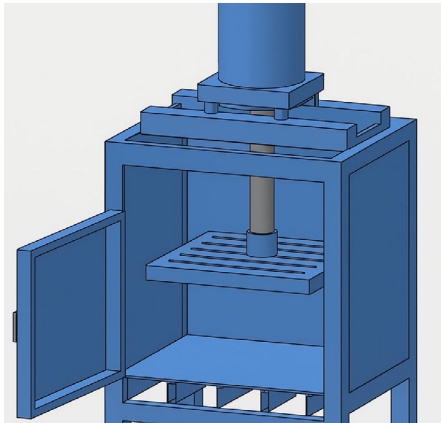


Design, Fabrication, and Testing of Trommel Screening Machine for Fertilizer Grading

This project aims to improve the efficiency and accuracy of fertilizer and compost grading through the design and development of a Trommel Screening Machine. The machine features an inclined rotating drum with perforations of varying sizes to separate materials based on particle size, achieving a grading accuracy of 90%. Built with a 0.75 HP electric motor, a mild steel frame, and an optimized pulley system, the machine ensures smooth and consistent rotation of the drum. It boasts a production capacity of 117.6 kg/hour, making it ideal for small to medium-scale agricultural applications. Additionally, the system is energy-efficient, consuming only 4.4 kWh per day, which helps reduce operational costs. Beyond improving grading precision, the machine also enhances safety by minimizing human contact with compost and reduces the

need for manual labor, contributing to lower labor costs. It addresses the limitations of traditional grading techniques and aligns with sustainable agricultural practices by improving the consistency, quality, and usability of fertilizers and compost.

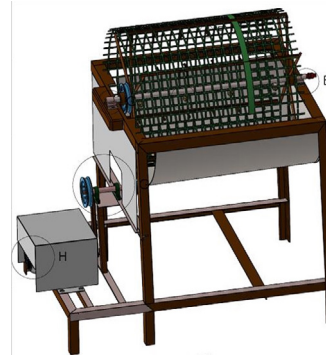
Team Members: Krisha Gurung, Rendira Maharjan, Shreya Dahal, and Shristi Pandey



Design, Fabrication and Testing of Hydraulic Baling Press Machine

This project presents the design, fabrication, and testing of a vertical hydraulic baling press machine aimed at effectively managing industrial paper scrap. Industries commonly struggle with the storage and processing of large quantities of scrap material, which takes up significant space and adds to operational inefficiencies. Compressing scrap into brick-like forms can dramatically reduce volume and improve storage and transport logistics. In this context, the project integrates principles of structural and form optimization to achieve a cost-effective, lightweight, and space-efficient solution. With increasing emphasis on sustainability and lean manufacturing, structural optimization techniques such as topology and shape optimization are used to enhance design functionality while reducing material usage and fabrication time. The hydraulic baling press machine developed in this project ensures optimum space utilization and enables efficient structural compression of paper scraps. This contributes to substantial cost-cutting in transportation, aligning with modern waste management and sustainable engineering goals.

Team Members: Deepak Chad, Sandip Acharya, Sudip Acharya, Swostik Karki, and Vishan Katuwal



Design, Fabrication and Testing of Ginger Washing & Peeling Machine

In response to the growing demand for efficient and hygienic post-harvest processing of root vegetables, this project focuses on the design, fabrication, and performance testing of a small-scale root vegetable washing machine. The machine features a rotating drum system integrated with a continuous pressurized water stream, specifically aimed at cleaning root crops such as potatoes and ginger. Performance evaluation was carried out under two operational speeds 60 rpm and 25 rpm with batch loads of 2.1 kg and 5 kg, and a fixed 1-minute retention time. The results demonstrated that the most effective washing achieving 80% cleaning efficiency occurred at the lower drum speed of 25 rpm, with minimal flesh loss. Flesh loss for the smaller batch was 2.3% for ginger and 2.35% for potato, while for the larger batch it was 2.05% and 2.25%, respectively. The machine successfully balances performance, simplicity, and resource efficiency, making it a suitable solution for small-scale farmers and agro-processing units. It also highlights the importance of design optimization in achieving operational effectiveness while minimizing post-harvest losses.

Team Members: Anish Shakha, Anishma Gyawali, Ayush Maharjan, Kritika Khadka, and Salina Maharjan



Design, Fabrication, and Testing of E-Scooter with an Arduino Integrated Locking System Using Re-Usable Lithium-Ion Batteries

This project involves the development of a low-cost electric scooter powered by re-usable lithium-ion batteries and integrated with an Arduino-based smart locking system. Designed with sustainability and urban mobility in mind, the scooter uses a 24V, 250W DC motor, a custom-built 24V, 13Ah battery pack from repurposed 18650 cells, and a mobile app-enabled QR code system for unlocking. The chassis and components were modeled in SOLIDWORKS, fabricated using mild steel, and assembled with easily replaceable parts.

The scooter reached a top speed of 17 km/h in practical tests, closely matching simulated results. With a total cost of around NPR 51,000, it offers an affordable and scalable solution for micro-mobility in Kathmandu, aiming to reduce traffic congestion and promote clean transportation. The project also lays the foundation for potential rental-based applications in the future.

Team Members: Bibek Belbase, Bidhan Dhakal, Savar Kharel, Shiva Neupane, and Shreyak Aryal

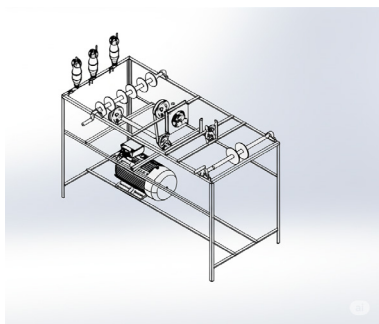


Design and Fabrication of CFT Vermi Composting Model

This project focuses on designing a Continuous Flow-Through (CFT) Vermi Composting Model to improve the efficiency of organic waste management and promote sustainable agriculture. Unlike traditional batch composting methods, the CFT model allows for continuous feeding of organic waste and simultaneous harvesting of nutrient-rich vermi compost, minimizing manual intervention and processing delays.

The designed model features a 3 ft × 2 ft × 1.3 ft composting chamber with an initial capacity of 110 kg. It maintains optimal conditions for worm activity using sensors to regulate temperature (19–25°C) and moisture (28–52%). The system can produce approximately 7 kg of vermi cast per week, enriched with essential nutrients like nitrogen, phosphorus, and potassium. A screw-driven breaker bar mechanism enables smooth, linear harvesting. This model offers a scalable and eco-friendly solution to manage biodegradable waste, reduce landfill burden, and support climate-resilient farming practices.

Team Members: Anil Gautam, Krishal Kumar Gupta, Pujan Nepali, Sudish Yadav, and Sunil Shrestha

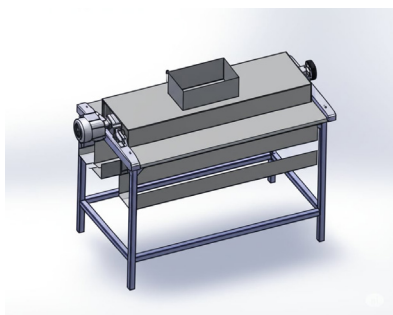


This project presents the design, fabrication, and testing of a 3-ply rope-making machine that transforms discarded Polyethylene Terephthalate (PET) bottles into strong, eco-friendly ropes. The system shreds plastic bottles into strips, which are then twisted into durable 3-ply ropes using a gear-driven mechanism. The resulting ropes exhibit high strength, moisture resistance, and cost-effectiveness, making them suitable for both household and industrial applications.

By converting plastic waste into a valuable resource, the machine directly addresses the issue of plastic waste management while promoting environmental sustainability.

The report covers the machine's design details, technical specifications, cost analysis, and potential applications, highlighting its role in recycling innovation and resource efficiency. This solution not only reduces landfill waste but also offers an economically viable alternative to conventional synthetic ropes.

Team Members: Alisha Bhandari, Ashok Limbu, Nabin Poudyal, Sonam Magar, and Utsaha Sapkota



Design and Fabrication of Corn Peeling Machine

This project presents the design and fabrication of a manual-cum-motorized corn peeling machine aimed at improving the efficiency, speed, and safety of traditional corn peeling methods. In many rural and semi-urban areas, corn is still peeled by hand, which is time-consuming, labor-intensive, and inconsistent. The proposed machine addresses these challenges by combining a roller-based peeling mechanism with an optional motor drive to automate the process.

The machine consists of two rotating rollers enclosed within a mild steel frame, where dried corn cobs are inserted for peeling. The rollers remove the kernels efficiently through mechanical abrasion, and the system includes a hopper, handle, motor, and gear assembly for flexible manual or electric operation. During testing, the machine

successfully processed corn at a significantly faster rate compared to manual methods, with minimal kernel damage.

Designed for ease of operation, portability, and affordability, the corn peeler is highly suitable for small-scale farmers and agro-based micro-industries.

Team Members: Bibek Rijal, Hemant K.C., Kshitiz Niraula, Rajiv Adhikari, and Sanjeev Pandey

IISE Body of Knowledge



Interview with Sukirti Sharma, CEO of We Build



Sukirti Sharma

Founder and CEO of We Build Construction Services and **WE BUILD** Enterprises



Human beings don't stand out because of their outfits or shoes, but because of their content. Work hard and be skilled, your content will always speak louder.

Construction

Sukirti Sharma is anything but ordinary. From the moment we met her, it was clear that her presence filled the room with strength and vision. As the CEO and Founder of We Build Construction Services and Enterprises, she stands at the forefront of innovation, carving a space in the male-dominated world of engineering and infrastructure. We sat down with her to explore her journey, the challenges she's faced, and her bold dreams for Nepal's construction future. "Human beings don't stand out because of their outfits or shoes, but because of their content. Work hard and be skilled, your content will always speak louder."

1. You've had quite an unconventional journey. How did it all begin?

I got married at 18, which many consider early. But I didn't conform to society's expectations. I completed my education and graduated as a Civil Engineer. My first job was with Nepal Investment Bank where I gained valuable experience by helping open several branches. But I always had a bigger vision. That's why I started We Build Enterprise, to pursue innovative construction ideas across Nepal. It was a bold step, but one I don't regret.

2. You're known for pioneering Vertical Rotary Parking in Nepal. Can you tell us more about that?

Introducing vertical parking was incredibly tough. I carried my designs from one Ward office to another, looking for someone to believe in the idea. After two years of knocking on doors, we finally triggered a policy change. Now, only municipal approval is needed. It even has a Nepali name: "Tahagat Parking". The provincial government allocated a budget for it, though it's yet to be properly utilized. Still, getting that first step done, bringing about policy change was a big achievement. Now, we're seeking private clients for installation, although COVID-19 slowed things down.

3. What other projects are you launching through We Build?

We Build focuses on innovation. We're not just a construction company we import and introduce technologies Nepal hasn't seen before. Some of our projects include Solar Roof Tiles, LED structural lighting, and Solid Waste Management systems that reduce landfill dependency. For example, our waste technology uses Microwaving and Autoclaving to reduce garbage volume by 90%—from 10kg to just 1kg without emitting harmful gases. We also handle traditional construction, but it's innovation that defines us.

4. What are the biggest challenges when working with new technology in Nepal?

The hardest part is changing the mindset, especially those in power. There's political instability and frequent leadership turnover, making approvals tough. For any innovative product or system, you're constantly explaining yourself from scratch. There's also the unfortunate habit of underestimating something just because it's new.

5. How viable is your Solid Waste Management project in Nepal's current context?

Nepal has land scarcity, and dumping waste in open landfills is dangerous. The system we're introducing disinfects and shrinks waste without harming the environment. It's like a microwave, you put in 10 kg, and get just 1 kg out. This could be revolutionary if implemented right, and I believe it's highly viable across hospitals, municipalities, and even industries.

6. Have you collaborated with local universities or startups for R&D?

Unfortunately, Nepal lacks the advanced facilities and infrastructure for full collaboration. We still have to import many components. But what we can do is help young minds, through incubators and research support, to learn how these innovations work. We want to foster curiosity and help them explore the next level. Manufacturing might not be possible here yet, but training definitely is.

7. There's a growing brain drain in Nepal. How has that affected your workforce?

It's a big issue. We train many workers through CTEVT programs, but many leave for jobs abroad after gaining skills here. To retain talent, we offer competitive salaries and benefits. Our team is older on average, and they find comfort in the environment we've built. But yes, brain drain hurts. That's why we focus on creating a strong research and development culture, it's our way of building loyalty and offering long-term growth.

8. The construction sector has few women leaders. What's your experience been like as a woman in this field?

This is a male-dominated space, no doubt. Often, men bond among themselves, and women are left out of those inner circles. You must push harder. When I say I'm an engineer, I still see people raise their eyebrows. But now it's habitual, I say it with pride. The bias is real, even when qualifications are the same. I want women to know:

"Human beings don't stand out because of their outfits or shoes, but because of their content. Work hard and be skilled, your content will always speak louder."

9. Your company values quality deeply. What does that look like in practice?

We never compromise on quality. Whether it's a glass panel or a switch, if we have to import it, we will. We take pride in our craftsmanship. Many iconic buildings in Kathmandu are part of our portfolio like UN Park and Labim Mall. Safety is also critical, human capital is our most valued asset. We maintain close relationships with our clients, communicate everything transparently, and ensure they return to us again. Integrity and reliability are pillars of our business.

10. Maintaining time, cost, and quality is tough. What advice do you have for other companies trying to find that balance?

Honestly, there's no one-size-fits-all advice. Each company is different. But relationships matter. Treat your staff as your greatest asset. A happy team means a thriving company. When selecting clients, assess their financial and social background it helps mitigate risks. Sometimes, delays happen. We remain understanding and professional without compromising on quality. That balance has sustained us. "If every staff member in your company is happy, the company will blossom by itself."

Quick Fire with Sukirti Sharma:

Advice to women?

"There is no difference between females and males in terms of skills and value. The only difference is encouragement. You need drive, determination, research, and networking to succeed."

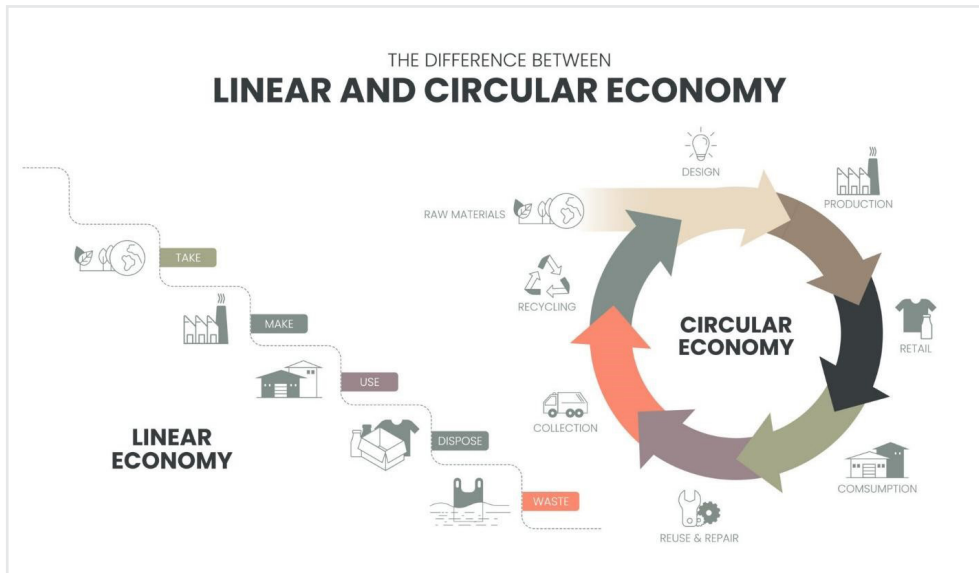
"Be aware that you may have to work harder than the guy next to you for the same pay, but your natural ability to multi-task and lead is your strength."

Message to your younger self?

"I'm proud of you. You took the unconventional path and inspired many. You made the right decision, no matter how hard it was."

Message to Industrial Engineers?

"Be hungry for innovation. Demand it. Don't shy away from approaching the government with your plans. I did it once and it worked."



The Role of Circular Economy in Revitalizing Industries: A Nepalese Perspective

The circular economy is a concept where materials never become waste and nature is regenerated. In a circular economy, products and materials are kept in circulation through processes like maintenance, reuse, refurbishment, remanufacture, recycling, and composting in order to reduce waste. The circular economy tackles climate change and other global challenges, like biodiversity loss, waste, and pollution, by mitigating economic activity from the consumption of finite resources. The traditional linear economic model, characterized by a 'take-make-dispose' approach, has led to resource depletion and environmental challenges. In contrast, the circular economy promotes sustainability by minimizing waste and maximizing resource efficiency. This model is reshaping industries by fostering innovation, reducing environmental impact, and ensuring long-term economic growth.

Circular Economy Principles:

The circular economy is guided by three foundational principles:

- Eliminating Waste and Pollution-Products and systems are designed to reduce environmental harm.
- Circulating Products and Materials-Items are reused, repaired, remanufactured, or recycled to extend their lifecycles.
- Regenerating Natural Systems-Natural capital is restored, such as through composting and regenerative agriculture.

These principles help decouple economic growth from environmental impact, creating a more resilient and sustainable industrial landscape.

Circularity in Nepalese Industries: Past, Present, and Future:



Reduce waste, reuse resources, and rethink the future-embrace the circular economy!

1. Past: Traditional Practices with Circular Roots

Historically, Nepalese communities practiced circularity long before the term was coined. Traditional industries like agriculture, handicrafts, and textiles operated with minimal waste:

Farmers reused organic waste as compost and practiced crop rotation. Artisans used natural, biodegradable materials for textiles and crafts.

Households repaired items like shoes, clothes, and utensils, extending their lifespans.

However, the lack of industrial-scale infrastructure and a shift toward disposable, imported goods in recent decades saw the depletion of these sustainable traditions.

2. Present: Emerging Circular Practices

Today, Nepal is gradually recognizing the value of circularity. Several sectors are incorporating sustainable and circular practices:

Manufacturing:

SMEs are exploring the reuse of industrial by-products, like brick kilns using recycled ash and steel plants adopting scrap recycling. However, these adoption practices remain scattered due to lack of incentives and awareness.

Textiles and Handicrafts:

Pashmina producers are experimenting with leftover fiber repurposing. Felt and hemp industries are revisiting traditional zero-waste methods and circularly upcycled fashion products are gaining niche popularity.



Sabal Dahal

Batch of 2078, Bachelor's in industrial engineering



or extremely important three years ago. Today, that number has risen to around 75%, and in three years, it is expected to reach around 95%, according to a survey of 420 top global executives across 10 manufacturing industries by the World Economic Forum, Bain & Company and the University of Cambridge. Despite its benefits, the circular economy faces challenges such as technological limitations, policy gaps, and resistance to change. Overcoming these barriers requires industry collaboration, government policies, and investment in sustainable innovations.

Economic and Environmental Benefits for Nepal

Adopting circular economy strategies can bring transformative benefits:

Resource Efficiency: Reducing

material imports and maximizing local resources enhances industrial competitiveness.

Innovation and Employment: New business models (repair cafes, upcycled goods, remanufacturing) create jobs and foster entrepreneurship along with preventing the waste of materials and promoting circularity.

Environmental Sustainability: Lower carbon emissions, cleaner cities, and reduced landfill dependency will support Nepal's climate targets under the Paris Agreement where Nepal participated in COP21.

Conclusion

Nepal's journey toward a circular economy blends its rich sustainable heritage with modern innovation. By recognizing the value of circularity, Nepalese industries can unlock economic resilience, reduce ecological harm, and build inclusive prosperity all while sustainably maintaining its rich heritages. With the right policies, infrastructure, and collaboration, the circular economy can become a pillar of Nepal's industrial future—reconnecting progress with planetary health.

Tourism and Hospitality:

Eco-resorts, especially those located in Chitwan and Pokhara, are using local materials, composting waste, and encouraging tourists to minimize plastic use. Waste segregation and plastic reduction efforts are active in some trekking regions like the Annapurna Circuit to preserve the existing natural heritage.

Agro-processing:

Startups like Organic Village Nepal and Kheti Food are using circular models—turning agricultural waste into compost or livestock feed and processing local produce to reduce post-harvest loss.

Waste Management:

Municipalities like Lalitpur and Dharan have started waste segregation and community composting programs supporting circularity principles, with support from various NGOs and international partners.

Future Outlook and Challenges:

Businesses across industries increasingly recognize the potential of circularity to create value through revenue growth, increased resilience, sustainability and cost reduction. The perception of the importance of circularity has grown significantly -only 40% considered it important

ELIA5 (Explain Like I'm Actually Five)

A circular economy means not wasting anything—just like how we can fix old toys, reuse boxes, or turn banana peels into plant food! Long ago, Nepal was great at this (farmers reused scraps, families repaired things), but now we throw too much away. Today, some businesses are bringing back smart ideas—like recycling fabric, composting food, and using less plastic. If we keep going, Nepal can save money, create jobs, and keep nature clean. The key? Don't trash it—reuse, recycle, or rethink it!



Industrial Estates Research Program

”

Industrial Estates should no longer be seen as relics of past development plans but as engines of innovation, jobs, and self-sufficiency. And it is time Nepal reclaims that potential : industry by industry, estate by estate.

Introduction: The Foundation of Industrial Growth

An Industrial Estate is more than a cluster of buildings or manufacturing zones, it is the beating heart of a nation's industrialization efforts. At its core, an Industrial Estate is a geographically demarcated zone where infrastructure and services are developed systematically to support the operation and growth of industries. These estates are typically equipped with common facilities like electricity, water supply, transportation access, banking services, post offices, security, waste management, technical assistance, and canteen services. The objective is to reduce the overhead burden on individual industries by providing shared resources and enabling an ecosystem of industrial collaboration.

As defined by Alexander (1966), an Industrial Estate is a group of factories constructed on an economic scale in suitable sites with the necessary facilities and technical guidance. They are designed to foster the smooth functioning of industries, ensure optimal resource utilization, and promote regional and national development.

In the context of Nepal, Industrial Estates are critical infrastructure for our country's future industrial trajectory. They serve as incubators for small, medium, and large-scale industries. Despite this potential, many estates in Nepal are currently underperforming due to outdated systems, lack of strategic planning, and insufficient policy support.

Present State of Nepal's Industrial Estates

Nepal currently has 11 officially established industrial estates managed under the Ministry of Industry Commerce and Supplies and the Industrial Districts Management Limited a government-owned institution:

1. Balaju Industrial Estate (Kathmandu),
2. Bhaktapur Industrial Estate (Bhaktapur),
3. Birendranagar Industrial Estate (Surkhet),
4. Butwal Industrial Estate (Butwal),
5. Dhankuta Industrial Estate (under construction due to technical problems),
6. Dharan Industrial Estate (Dharan),
7. Hetauda Industrial Estate (Makwanpur),
8. Nepalgunj Industrial Estate (Nepalgunj),
9. Patan Industrial Estate (Lalitpur),
10. Pokhara Industrial Estate (Pokhara),
11. Gajendra Narayan Singh Industrial Estate (Rajbiraj)

The first estate was built in 2016 B.S. and inaugurated in 2020 B.S., laying the foundation for formal industrial development in Nepal. However, the rate of industrialization has not kept pace with global standards or even regional neighbors. With inadequate investment in modernization and poor estate-level planning, the existing estates are struggling to become the engines of economic transformation they were designed to be.

SOIES Nepal's Initiative: The Industrial Estate Research Program

As a student-led organization committed to the advancement of Industrial Engineering in Nepal, SOIES Nepal initiated a comprehensive research initiative titled the Industrial Estate Research Program in 2025. The primary objective of the program was:

- To study and analyze the current state of Nepal's industrial estates.
- To identify structural and systemic inefficiencies.

- To recommend practical solutions through the lens of Industrial Engineering.
- To strengthen academia-industry policy feedback loops by presenting findings to stakeholders.

This initiative involved on-site visits, surveys with industry owners, interviews with estate management officials, interaction with factory supervisors, and presentations to government bodies. It was an effort to understand the real challenges industries face within estates and the untapped opportunities that could be unlocked through policy innovation and systems design.

Critical Findings from the Research Program

Our field research across multiple industrial estates revealed significant systemic issues that are inhibiting industrial growth. These are not just operational inefficiencies but structural and policy-level problems that need long-term vision and immediate interventions.

a) Outdated Infrastructure and Lack of Innovation

Most estates are still operating with outdated infrastructure, manual security check-ins, absence of centralized digital systems, poor communication channels, and lack of automated logistics or warehouse systems. This increases operational costs and reduces industrial competitiveness.

b) Absence of an Ecosystem Approach

Despite being located in close proximity, industries within the estates operate in silos. There is no formal collaborative platform for sharing resources, research, logistics, or market access. This leads to underutilization of resources and missed opportunities for synergy.

c) Weak Policy Support and High Operational Costs

Industries within estates receive no fiscal incentives, no import substitution support, and no protective taxation on foreign goods. In contrast, the land lease costs are rising, and utilities are becoming more expensive, further discouraging production growth.

d) No Digital or Promotional Platform

There is no official platform to showcase the products manufactured in the estates. As a result, factories struggle with low brand visibility, limited market access, and difficulty in scaling. This affects both B2B and B2C growth opportunities.

e) Lack of Skilled Human Resources

Surprisingly, many industries within the estates do not hire Industrial Engineers or process engineers. Factory supervisors admitted to hiring freelance foreign consultants only when necessary, as Nepal lacks structured mechanisms to connect qualified engineers with industries.

f) Absence of Knowledge-Sharing Programs

There are no regular seminars, technical workshops, or factory improvement programs. This creates a vacuum where industries cannot keep up with global advancements in lean manufacturing, ERP systems, or sustainability practices.

g) Poor Estate Layout and Infrastructure

Many estates suffer from poor navigational design, unmarked plots, and unclear estate boundaries, which complicates logistics, deliveries, and site management. Waste disposal systems and road maintenance are often neglected.

The Vision Forward: What Needs to Be Done

Based on our extensive research and consultation, we propose the following policy and strategic interventions:

A) Government-Level Initiatives

Subsidized Support for SMEs: Reduce land rent for industries in their initial 5 years to support their survival and growth.

Industrial Digital Hub: Establish an official government-maintained portal where industries can register, promote, and market their products.

Estate Upgradation Program: Allocate budget to modernize aging estates with smart utilities, renewable energy grids, and automated facilities.

Industry-Academia Partnership Framework: Institutionalize collaboration with engineering colleges for joint R&D, internships, and plant

layout optimization.

Tax Reforms for Domestic Product Promotion: Implement higher import duties on foreign goods that compete with estate-produced items.

Estate-Level Innovation Grants: Create a fund to support process improvements, new product development, and digital transformation.

B) Estate Management Recommendations

Formation of Industry Clusters: Facilitate inter-industry collaboration on procurement, production, logistics, and R&D.

Monthly Stakeholder Meetings: Ensure continuous dialogue between estate management, industry representatives, and local government.

Periodic Factory Assessments: Conduct quality audits, safety inspections, and machinery lifecycle assessments annually.

Mapping and Navigation Upgrades: Develop detailed maps, signage, and estate-wide communication systems.

Promotion of Estate Events: Organize local industrial exhibitions, such as the International Industrial Trade Fair, to connect industries with customers.

The Untapped Role of Industrial Engineers

This is where our discipline i.e. Industrial Engineering emerges as a powerful catalyst. Often misunderstood or underutilized, Industrial Engineers are trained to work at the intersection of engineering, management, and innovation. Here's what we bring to the table:

Systems Optimization: Reconfiguring operations for leaner, faster, and more cost-effective performance.

Facility Layout Design: Improving workspace arrangements to maximize efficiency and minimize waste.

Supply Chain Engineering: Enhancing flow of goods from procurement to production to delivery.

Quality Control & Assurance: Ensuring high product quality, regulatory compliance, and customer satisfaction.

Sustainability and Energy Audits: Designing environmentally friendly production processes and reducing carbon footprint.

Ergonomics and Safety Engineering: Creating safer and more comfortable workplaces that increase productivity.

Digital Integration: Implementing ERP, IoT, and smart manufacturing systems

for modern industrial operations.

In short, Industrial Engineers are the planners of the new industrial future who are trained to design, manage, and continuously improve the entire ecosystem of production and service delivery.

Conclusion

The future of Nepal's industrial development depends heavily on how effectively we manage and transform our industrial estates. If these zones are envisioned not just as land banks but as innovation-driven ecosystems, they can lead Nepal's transition from a consumption-based economy to a production-driven, self-reliant, and export-capable industrial nation.

Through the Industrial Estate Research Program initiated by SOIES Nepal, we discovered that the issues are solvable and the tools are already in our hands. What is required now is visionary leadership, investment in innovation, and the courage to redesign the old frameworks.

We believe Industrial Engineers must be at the center of this transformation. With our expertise, adaptability, and systems thinking, we can be the bridge between what is and what should be.



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Voices from the Field

Eight research teams. Eight destinations. Eight distinct experiences.



Gajendra Narayan Singh Industrial Estate – Team Rajbiraj

We observed a uniquely structured plant layout, constructed with impressive uniformity. However, a critical concern was the lack of water supply. Addressing this issue could significantly enhance productivity and create a more supportive environment for the industries operating within the estate.

Patan Industrial Estate – Team Patan

Our visit offered deep insights into real-time operations, emerging technologies, and skill development scopes. Despite challenges, the estate shows great potential. We recommend expanding such research programs to engage more students and stakeholders for a broader and more impactful learning experience.



Dharan Industrial Estate – Team Dharan

This visit exposed us to pressing issues like outdated infrastructure and a lack of modern technology. Investing in eco-friendly upgrades, skilled manpower, and modernization efforts is essential for the estate to thrive and support industrial growth in eastern Nepal.

Nepalgunj Industrial Estate – Team Nepalgunj

Our fieldwork revealed infrastructure limitations, land scarcity, and poor waste management. Interacting with industry personnel, we identified actionable solutions focused on technology adoption, sustainable practices, and industrial engineering for policy-level improvements across the estate.





Balaju Industrial Estate – Team Balaju

Balaju hosts a wide range of industries, but we sensed the need for structured promotion and development. With proper funding, marketing, and strategic planning, these industries can flourish and become key contributors to Nepal's economic growth. We're thankful for the warm welcome.

Hetauda Industrial Estate – Team Hetauda

From our visit, we learned that Hetauda holds strong potential. The industries were welcoming and transparent, yet lacked coordinated promotion and development. Planned investments and policy-level encouragement could unlock large-scale growth in one of Nepal's oldest industrial hubs.



Bhaktapur Industrial Estate – Team Bhaktapur

The estate blends heritage and modern industries remarkably. We appreciated the production diversity, but challenges like waste handling, safety gaps, and limited innovation persist. Introducing better practices can help the estate play a larger role in Bhaktapur's economic and social upliftment.

Pokhara Industrial Estate - Team Pokhara

Our visit to Pokhara Industrial Estate offered insights into local industrial practices. We observed equipment use, labor roles, and safety measures. For further improvement, upgraded facilities and strong administrative planning are necessary.



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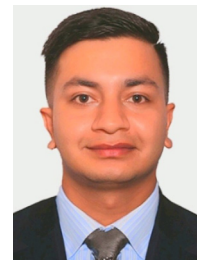
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6

SURPRISING FACTS AND STATISTICS ABOUT PRODUCTIVITY

FACT

1



You can complete technological work faster and to a higher quality standard while **listening to music** than while not.

FACT

2



Workers show better time management, interpersonal performance and effectiveness on days where they **exercise in the morning** before work.

FACT

3



Tuesday is the most productive day of the week.

FACT

4



Adults who regularly get between **7.5 and 9 hours of sleep per night** can be up to 20% more productive.

FACT

5



After working **40 hours** in a, productivity decreases by 50%.

FACT

6



Drinking alcohol to a moderate intoxication level of .075 can **boost creative thinking**.

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INDUSTRIAL VISIT



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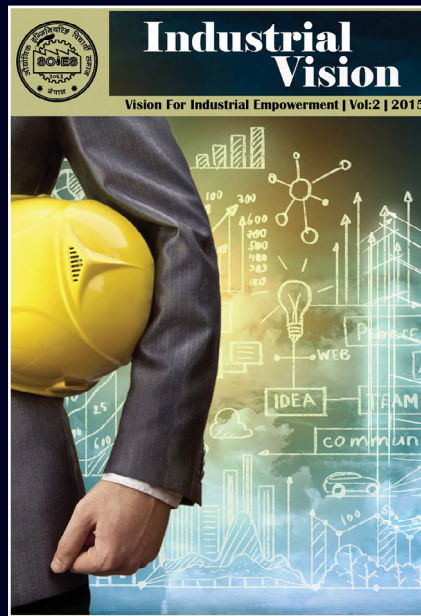


BATCH 2078



BATCH 2079

A DECADE OF INDUSTRIAL VISION

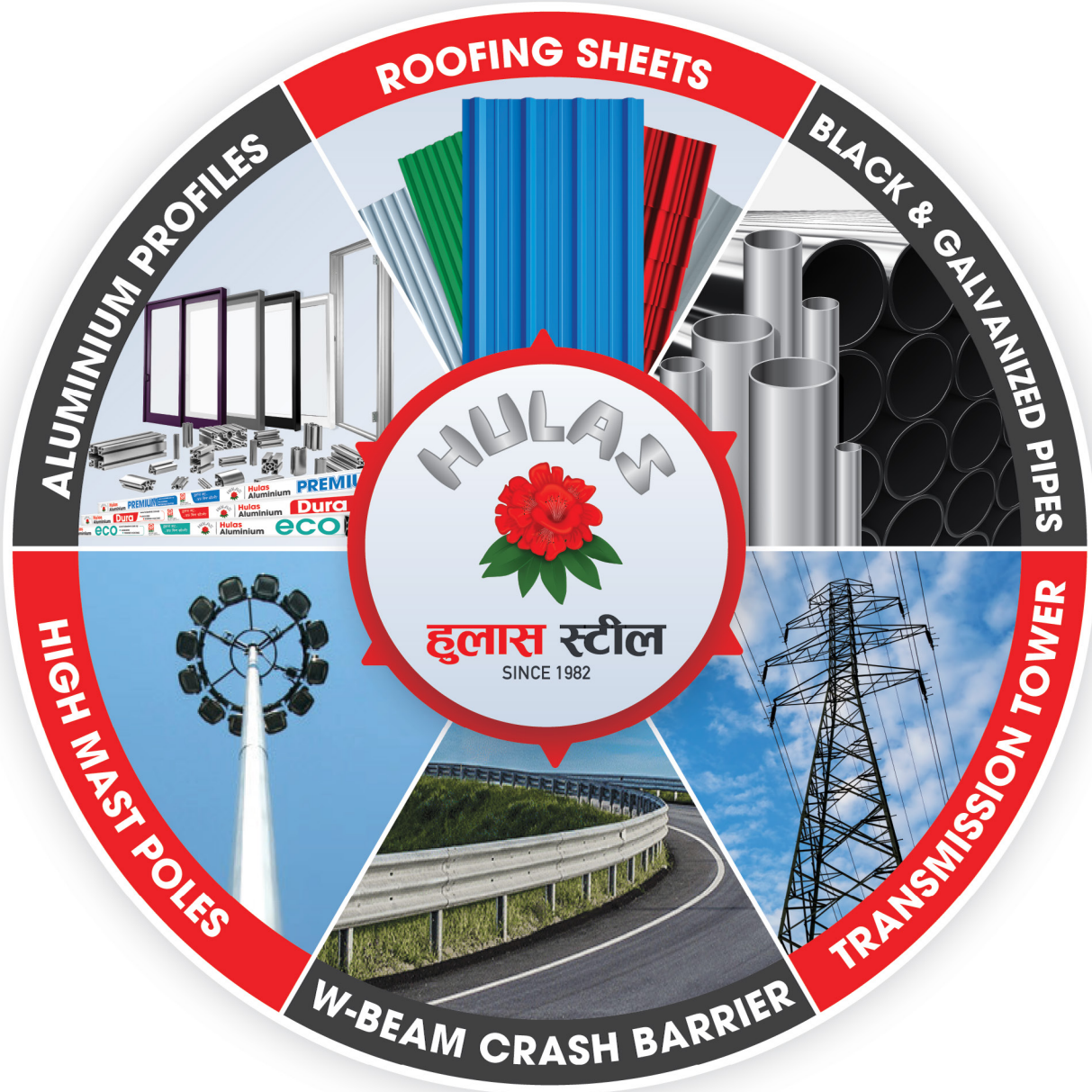




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