



The Econo Press

Department of Economics, Kalindi College

July'22-June'23

Vol III

DECODING SUSTAINABILITY AND TECHNOLOGY



IN THIS VOLUME: 1. Recent Trends in Sustainability & Technology 2. Progressing towards sustainability through EBP & Behavioural Economics 3. Econ-Insights into a Responsible Tourism and Healthcare Sector and more!

FROM PRINCIPAL'S DESK

I extend my heartiest congratulations to the Department of Economics, Kalindi College for another successful academic year and the launch of the latest issue of The EconoPress.



Conversations around sustainability and environmental challenges shrouding the world hold immense importance in times like these and I feel immense pride in the students as they contribute to the discourse in their own unique manner.

I wholeheartedly commend the team of EconoPress for portraying this pressing matter through meticulous research transcending the boundaries of the academic curricula.

It is the power of the written word that enlightens and inspires us and sows the seed of transformative action. Such dialogue around sustainability plays a pivotal role in fostering a shared commitment and driving collective action.

I am elated to see our students passionate towards such causes and would like to applaud the efforts of the Editorial Team in drawing attention towards the same. I would like to extend my best wishes to the faculty as well as the students of the Department of Economics for bringing forth a fresh issue of their annual newsletter.

Prof. Meena Charanda Acting Principal Kalindi College

FROM TEACHER IN CHARGE

I am elated to announce the latest edition of "The EconoPress".

"The EconoPress" is our attempt to provide



a platform for our students to explore the world of economics beyond their academic framework. The current issue of the newsletter explores sustainability and technology against the backdrop of 21st-century developments and the growing question marks over our future. In 2015, the United Nations designed the Sustainable Development Goals (SDG) as a "shared blueprint for peace and prosperity for people and the planet, now and into the future". Agenda 2030 set the world on a race against time to achieve the 17 interlinked objectives by 2030. At a point where we are closer to the deadline of SDGs than the year of their formulation, it is imperative to discuss, disseminate and communicate information and ideas on solutions and challenges alike. This task is all the more pertinent in the era of increasing dependency on technology.

I am proud to see our students passionate towards such an important cause and would like to applaud the efforts of the Editorial Team in drawing attention towards the same. I would like to congratulate everyone involved in putting together this issue of "The EconoPress" and invite the readers to celebrate the achievements of the Department of Economics with us.

I extend my best wishes to the faculty advisors and the student members of the Editorial Team.

Prof Indu Choudhary Teacher in Charge Department of Economics



Dr Punam Tyagi

Associate Professor Department of Economics

Council Advisor's Desk



Ms Pummy Yadav

Assistant Professor Department of Economics

FROM COUNCIL ADVISOR'S DESK

It was quite inspiring to watch and witness the potential of our students unfolding at various stages and situations each day. Trying and testing times during the hectic semester system have elicited our students to put forth their best. During the Academic Session of 2022-23, the Economics Society conducted various activities such as guest lectures, seminars, workshops and annual fest that were undertaken by the students in view of helping them reach the pinnacle of perfection and professionalism in whatever task they took on, thus strengthening their journey of achieving excellence.

The E-newsletter exemplifies the voyage transverse and exhibits the literary skills of our students.

The students have been fostered to be "humane professionals" in every act and there is no doubt that our outgoing batch of 2020-2023 will indeed reach greater heights in life.

Best wishes and blessings to our dear outgoing students.

Congratulations to the editorial team for their determined efforts in bringing out this newsletter.

Council Advisors Dr Punam Tyagi Associate Professor Department of Economics Kalindi College

Ms Pummy Yadav Assistant Professor Department of Economics Kalindi College

FROM FACULTY ADVISOR

It is indeed a matter of great joy and pride that The Department of Economics of Kalindi College is releasing the next issue of their annual E-Newsletter "THE ECONO PRESS" for the Academic Session 2022-23.



I congratulate THE ECONO PRESS team for their hard work in the launch of the third volume. As the faculty advisor, it has been a privilege to be a part of the journey. The following pages contain an assemblage of our students' thoughts, ideas and opinions reflecting the enthusiasm of students in this academic year issue. This time we are bringing for our readers, a diverse selection of stimulating readings from various scholars and from our own students highlighting a plethora of issues.

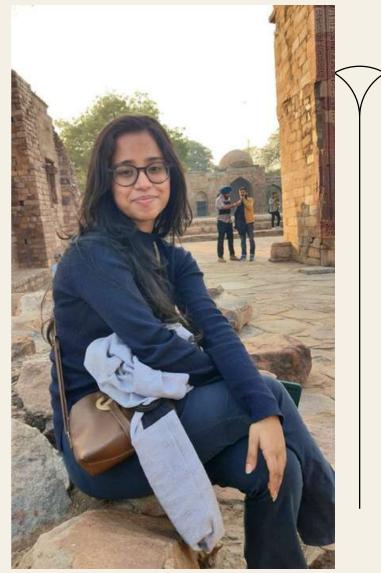
I appreciate the efforts of the Chief Editor Ritika Yachna, the Deputy Chief Editor Prachi Ankoti and the coordination of the entire team, your efforts have been vital in the successful completion of the newsletter. Special thanks to all these budding economists, for contributing their articles; and so to the team members who worked patiently, enthusiastically, and tirelessly for conceiving, collating, and drafting this edition. The entire team has made this endeavour bounteous, I would like to wish the students great success in their future endeavours as well and hope that this journey of exploration continues for them and for the coming batches as well.

Faculty Advisor Ms. Phunchok Dolker Assistant Professor, Kalindi College



Ritika Yachna Editor-in-Chief

Editor's Desk



Prachi Ankoti Deputy Editor-in-Chief

With the deadline of 2030 for achieving the United Nation's Sustainable Development Goals on the head, the development sector has never been this active before. Governments across the world are introducing new policies to push the economy towards zero emission, focusing on adoption of the sustainable lifestyles, eradicating inequality arisen due to mindless focus on rapid economic expansion and bringing the primary stakeholders to the forefront of the fight against climate change. However, the world is not the same as before. The 21st century is characterised by introduction of the futuristic gadgets and technologies that are contributing to making lives easier, with a swipe on the screen. However, one major challenge lurking over our shoulders is the urgent need to address the environmental crisis by constantly being in search of sustainable solutions for the betterment of our planet. As climate change and economic development seem to be following the same trajectory, various solutions and prospects of solutions have come to light in different parts of the world. We believe that exploring and propagating these ideas and research is the next step toward refining and implementing the concept of 'Sustainability'.

The latest issue of the EconoPress explores the theme 'Sustainability and Technology: Exploring Current Trends and Future Outlook'. The team has curated thought-provoking articles that demonstrate the crucial role played by sustainability in the everyday decisions of people, and the integration of this important concept in the evolving policies across the world while delving into the realm of technology.

The Editorial Board would like to extend a token of thanks and gratitude to our TIC, Professor Indu Chaudhary, our faculty advisor, Ms Phunchok Dolkar, our convener Dr Punam Tyagi and Ms Pummy Yadav, as well as the entire Department of Economics at Kalindi College, University of Delhi, for their unwavering support and guidance and for providing us with a platform to think outside the box and explore the practical aspect of our academic theories. Nothing would have been possible without the efforts of the brilliant writers and graphic designers in the team, who have put in their best efforts in researching and exploring the theme in depth. We would like to extend congratulations to everyone involved in bringing the latest edition of The EconoPress to life.

We hope that this issue leaves you with a deeper understanding of the domain of sustainability and technology, while also igniting conversations and challenging existing notions. We are hopeful that this might help cumulate the efforts towards saving this planet and inculcate the seriousness associated with the fight against climate change in our day-to-day decisions.

Regards,

Ritika Yachna Editor-in-Chief

Prachi Ankoti Deputy Editor-in-Chief

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REPORTING STATISTICS

SHADES OF CONSUMERISM

-Aavishi Singhal

It is common knowledge that economies depend on the producers to produce goods and services and the consumers to consume the same. Consumers are the backbone of any economy - their demands and expectations drive the engines of the economy. They create employment opportunities and wealth for businesses - the building blocks of GDP. This focus on the economic and social structure of demands and expectations, as well as the protection of consumers, is referred to as consumerism.

Consumerism can also be explained as the behaviour and attitude of consumers that shows a persistent desire for a better lifestyle. This ideology not only values but also promotes excessive consumption. It encourages fixating on commodities and services, especially those that people cannot afford with their current resources.

This section focuses on consumerism and how it is changing with technological development, with a discussion on the transformation of consumerism in India and the sustainability of



Products are being replaced faster than the influencers transitioning in reels. these changes. Let's begin with understanding the origins and evolution of consumerism through the last few centuries.

Interestingly, the concept of consumerism first emerged in the mid-18th century. Before that, the larger public purchased goods required for sustaining life clothes, food, shelter etc. This was majorly due to the income disparities between the classes. Consumers hardly had a choice, much less a motive, to increase their consumption of goods and services. A handful of people could consume sumptuous clothing, pottery or utensils of that era. The concept of consumerism developed along with the Industrial Revolution in the 18th century, beginning in the United Kingdom and spreading to North America. Eventually, consumer behaviour transformed globally.

Before the Industrial Revolution, goods were produced in a small-scale/cottage factory, handmade, and unique. However, the Industrial Revolution changes this forever, ushering the world into the era of cheap mass production. New machines were devised and introduced to produce commodities in large quantities. Now, a consumer could have choices and wants, not just needs. People could afford more variety of goods and services. This is how the Industrial Revolution makes you, today, overspend a little extra by accident sometimes. With the expansion of business and industries, wealth began to concentrate in the hands of business owners, who only helped to intensify the need for consumption.

For the longest time in history, there were

only two classes - rich and poor. A large society. The effluent had accumulated wealth, others struggled to make ends meet. With the Industrial emerged working middle class. Their incomes were higher than being poor, and they could afford some luxury, but riches still remained out of reach. It is often said that the emergence of this particular section members consumption beyond subsistence.

further developed Consumerism throughout the 20th century. Economists and historians consider the 1950s and "Golden 1960s Age Consumerism". During this time, goods became cheaper and accessible to the masses. The competition between brands selling similar products intensified. Thus emerged the concept of marketing - it existed on a small scale before; however, 20th century. Marketing refers to the advertisement of products to sell them to a much larger audience.

This revolution was brought about in the last century with the invention of radios, televisions and mobile phones. The new marketing strategies made people associate consumption with social standing. This caused an explosion in consumption rates. Marketing continues to be the most powerful tool for brands in the 21st century.

In the 21st century, the impact and prevalence of consumerism increased

dramatically. This was fuelled by globalisation, newer and effective marketing strategies and rapid technological changes.

One of the most visible manifestations of consumption was the emergence of online shopping platforms such as Amazon and Flipkart. Online shopping platforms enable consumers to access goods and services across the globe. With the introduction of credit and debit cards, then online banking and now UPI, it has become easier to spend money.

With all this development, consumerism began to define identity and social status. Individuals are now often defined by what they own, wear or consume rather than based on what they do or who they are. For instance, a person who wears clothes from Zara and owns an iPhone is judged as "well-off" and "better". This is how integral consumerism has become in our present society.

Is it empowering to have such an abundance of choices? Or is it overwhelming? Well, for most people, both. Marketing and advertising have played a significant role in promoting consumerism and shaping consumer behaviour. Advertisers have used every technique in the book - from emotional appeal to celebrity endorsements - to attract more buyers.

With the emergence of social media platforms like Facebook and Instagram and the increasing popularity of social media influencers, marketing and consumerism once again evolved.

and urgency to buy a of scarcity commodity consumers. The consumers feel compelled to consume these products to fit in with the "latest trend" or feel "FOMO" or outdated. The onlv caused developments in consumerism to become even more entrenched in modern society. Delivery services and online shopping have skyrocketed as more and more people started working and socialising at home. This is how consumerism evolved and developed in the last few decades.

Does consumerism play a pivotal role in the economy of a country? Yes. Does it have a negative side as well? Also, yes. It has led to inequality within and across societies. The increasing desire to buy trending goods and services has led to a divide between the haves and have-nots. Not only this, the volatile trends of today have given rise to a lot of waste as the products are being replaced faster than the influencers transitioning in reels. This is now damaging our environment.



This culture of using products for a short span and then throwing them away to replace or repurchase them is known as the throwaway culture. In companies and manufacturers deliberately produce goods that last for a short while so that the consumers spend more money. Due to this, a pile of toxic waste is being directly collected. harming surroundings. Fast fashion is the best 2000s, it describes a business model replicating trendy clothes at cheaper costs. These are mass-produced designs sold cheaply and are most appealing to middle-class consumers as it is easy for them to buy the latest trends at very cheap rates, use them for a few weeks,

Mass-production factories are one of the biggest polluters in the world. The toxic water waste from these factories is directly thrown into the rivers, adversely affecting aquatic life. The communities dependent on rivers for their water needs are also affected negatively in many ways. The never-ending pile of clothes that are being dumped by consumers daily are not biodegradable and harms the environment.

The over-exploitation of natural resources to meet the growing demands of the consumer is also a big concern. The dark side of consumerism can be combated with a few fundamental changes - a shift away from consumerism as defining feature of the status quo. This would include redefining achievement or success; community service, artistic expression, or career achievements are some examples. This would also require a shift in marketing and advertising methods, away from promoting materialistic lifestyles, luxurious products and experiences as status symbols.

Another approach towards curbing these side effects of consumerism is to target the resulting environmental issues. Promoting sustainable consumption, focusing on reducing environmental and social impacts of consumption while not compromising on people's needs and aspirations. This can be done in numerous ways - reducing waste by reusing or recycling products and promoting renewable energy sources.

The world has seen many shades of the centuries and has been influenced by a plethora of factors. This evolution is why consumers have become the most powerful entities of an economy and everything. control Anything new invented, devised, or introduced is done to influence the consumers and their behaviour. But sadly, most consumers are unaware of this fact and they are mindlessly being swayed by new "trends". To achieve anything, we need to start by making the consumers aware of the power they hold and guiding them in the direction that would be better for the economy and the planet.

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Your Wallet Meets the World

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-Ruchiraa Verma

"Technology has enabled and empowered many with a voice, a source of income and the audacity to aspire."

On 30th March 2023, Dior hosted a runway show at the Gateway of India in Mumbai. CNN noted this star-studded event as a signal of "India's growing luxury status". But India is not exactly Dior's clientele. Even target with rising disposable incomes, those earning more than Rs. 25,000 per month are in the top 10% of India. Nonetheless, the fashion event held across the road from the Taj Mahal Palace is symbolic of Dior's (and other brands) bet on the upward trend in India's taste for luxury - much like its location, it is their Gateway to India.

Such events are excellent examples of India's growing incomes and rising power on the global stage; however, these are far from the lived experiences of an average Indian. According to a report published in February 2023 by National Statistical Office (NSO), per capita incomes almost doubled from ₹86,647 in 2014-15 to ₹1,72,000 in 2022-23 at current prices. After adjusting for inflation, this increase falls to around 35% from ₹72,805 in 2014-15 to ₹98,118 in 2022-23 at 2011-12 constant prices.

So why are these brands setting their sights on a country where their products cost more than the multi-year annual incomes of the locals? How are existing premium players surviving the Indian economy where a simple cup of coffee from a well-known brand costs the same as the multi-day wages of a labourer? The juxtaposition of the elite and the rest of India is a thought-provoking study of the brutal realities of the world's 5th largest economy. Let's try to make some sense of it.

Technology is changing the way we shop and what we shop - it has been for a few decades now. Our aspirations have transcended our immediate environment to the global ecosystem. But aspiration and luxury are not to be confused with one another. While an aspirational brand may be a luxury good, it could also be something as simple as wanting to buy a Nescafé Gold instead of a Nescafé Classic, two coffee variants by Nestlé, the former being a more premium variant than the latter.

"Aspirational brand" is a relative term subject to the individual's choice and purchasing power; it is simply something consumers wish to own but cannot afford. However, aspirational branding is how most companies create a market for themselves. The long-term survival of a brand is dependent on creating a need, an experience, an emotion even, rather than just a product.

As The Hindu Business Line published in an article, "Beyond basic-need products, many consumers are making purchase decisions based on how products make them feel. And as consumers move up the economic ladder, they are attracted to aspirational brands that signal they have achieved a certain level of success". Cutting corners, saving every penny, sacrificing some needs - consumers are willing to pay the premium if it contributes to a sense of personal growth, status, success or achievement - a feeling of 'made it'.

At this point, I believe it is essential to note that this shift has the tech-savvy, young upper-middle class entering the workforce with spending habits drastically different from those that came before them, in the driving seat. Social media is a powerful tool. It opens the users' world the 'neighbourhood theory'. beyond However, the need to showcase a lifestyle is not new or modern. The need to have a certain status or at least appear as one is as old as civilisation. Technology is merely shifting the barriers of who one can flaunt to, therefore, what one desires or aspires to be.

With time, the concept of demand is changing. The information gap between consumers and producers is closing with increasingly widespread access to the internet. As noted in an article about manifestations of data in the music industry in The EconoPress' very first edition. "the internet is making commercial activities quicker and easier while also opening new avenues like merchandise and personalised communication between producers and consumers".

The implications are several. The audience is better situated to voice their demands, opinions and concerns. Boardrooms can take into account real-time data before taking executive decisions. Targeted advertisements are deployed to manipulate consumers' wants. At the same time, consumers are gaining increasing control over brand communication.

Now, let's look at the supply-side effects of India's changing aspirations. A month before Dior's show, not very far from





there, just across the state border, Karnataka amended its labour laws to become the nation's most "flexible working regime". The Factories (Karnataka Amendment) Bill 2023 was allegedly the result of lobbying by tech giant Apple Inc. and its supplier Foxconn, as reported by the Financial Times. This move comes at the heels of manufacturers looking to exit China. The amendment allows, among other things, 12-hour work shifts, and night-time work for women and Karnataka to become an alternate manufacturing base. Increase in economic opportunities for the locals and cheaper production of Apple's premium electronics, the coveted iPhones are expected.

Of things coveted, nothing is more aspirational than travel. Earlier this year, Tata Group signed multiple deals with USA's Boeing, Europe's Air Bus and the UK's Rolls Royce to expand their fleet as Air India returned home and AirAsia and Vistara merged with the multinational conglomerate. Again, a sign of Aspirational India's growing affluence and influence in global politics. While the LPG reforms of 1991 opened the Indian economy to the global market, the launch of Jio in 2016 propelled the economy in a very different direction. The internet has revolutionised income generation itself. Traditional careers are closely following traditional marketing out the door. Technology has enabled and empowered many with a voice, a source of income and the audacity to aspire.

In the last few years, the wealth gap between the classes has deepened, with the Covid-19 pandemic being the majority stakeholder of the cause. The top 10% saw their wealth grow multi-fold, whereas those in the middle and lower income classes saw their incomes dive. It is thus prudent to take any data on rising incomes with а pinch of salt. Nevertheless, it is not false that India is coming to its own. Dior's star-studded fashion show, followed by an even more red-carpet launch glittering of Nita Ambani's NMACC, is a testimony to the fact that India is emerging as a consumer in the global market, not just its back office.



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TECH WORLD WELCOMES 5G, BUT AT WHAT COST? -Shruti Mittal

5G can simply be interpreted as the 5th generation of mobile networks that connects through the internet. On October 1st, 2022, PM Modi inaugurated 5G telephonic services at an event in Delhi. Since then, 5G has been in the spotlight owing to its implications for our health and the environment. Scholars are globally concerned about the radiation it will release into the ecosystem. But before a public discourse could take shape, telecom companies launched a range of products, claiming them to be 5G functional, with the consumers being on the unfavourable side of asymmetric information.

According to Dangi et al. (2022), "5G is slightly different due to its novel features such as interconnecting people, controlling devices, objects, and machines. 5G mobile system will bring diverse levels of performance and capability, which will serve as new user experiences and connect new enterprises. Multiple-input-multiple-out (MIMO) is a very important technology for wireless systems. Massive MIMO will play a crucial role in the deployment of future 5G mobile



While metropolitan cities are set to step into the super-speed era, many areas in the country have not moved past the 2G network.. communication as greater spectral and energy efficiency could be enabled [sic]".

Industries that could benefit most from the 5G network are retail, healthcare, hospitality, financial services, transportation services, manufacturing, entertainment, and agriculture. However, as of the writing of this article, these remain speculation. In all likelihood, benefits will not be reaped equally around the world. At least in India, we are a long way from implementing 5G.

Nishant Bansal, a senior researcher with the International Data Corporation (IDC), said, "Right now, we do not have enough infrastructure to support a seamless 5G network connectivity. It would take another 18-24 months for India to reach the level of 80 percent fiberisation that would help deliver seamless network connectivity[sic]". This was December 2022. Even if industries attempt to implement 5G, it will be a long time before we can close the infrastructure gap.

According to a report published by CRISIL in August 2022, "the low level of fiberisation at present will necessitate network cap-ex of Rs 1.5-2.5 lakh crore in the next 2-3 years, with a potential 5-9% increase due to rupee depreciation this fiscal alone[sic]". The costs alone are a deterrent to the adoption of 5G.

In another report published in March 2023, CRISIL gave the following statment: "While the share of 5G smartphones shipments will improve gradually, still low initial value proposition and high cost of the

gadget versus a 4G phone would restrict overall 5G adoption to ~300 million users by fiscal 2025. Put another way, this would mean only a third of the data users in the country will be plugging into 5G services by fiscal 2025".

A quick Google search will reveal the price difference between a 4G mobile and 5G mobile. The hefty difference а between the starting price of the two (₹6,000 vs ₹19,000) while their features being seemingly the same to an everyday user, must make one question the veracity of the claims laid by the phone manufacturers. Indian telecom companies have not shown any significant profits in the last couple of years. Furthermore, a project like 5G will only exhaust its existing resources, and help from the will government increase budgetarv So, should expenditure. one buy a technology before its time?

According to an article in the Indian Express, there are three main domains to consider:

Coverage - Check that your region has access to 5G in areas of your residence and work before committing to buy a phone.

Price - Spending more money on a 5G phone or a 5G variant of the same device may seem like a suitable future investment; however, it will not be worth it if you do not have the coverage and budget for 5G plans. While 5G data plans may be priced equal to 4G in the initial stages, they can quickly climb up for faster service.

Performance - In the lower-end segments, 4G performs better than 5G compared to the same price. The 4G phone may not be the futuristic option, but it may still be the more powerful device.

Before purchasing 5G compatible devices, one must also consider the implication on our health as we are more or less attached to our devices 24/7. A study conducted in Belgium by Everaert & Bauwens (2007) shows that electromagnetic radiation emissions from cell towers affect the breeding and nesting habits of birds, leading some researchers to believe that high-frequency waves of 5G could harm animals and birds. They worry that radiation from mobile phones will alter system nervous and our body 5G will temperature. dearly cost healthcare and the environment because it will just pile on what 4G already costs us.

Since the 2020 publication of the WHO reports on the health and environmental effects of radiation, researchers have been divided into two groups - one who believes in the adverse effects and one who believes in overall better efficiency.

The research on the health implication of 5G is still in its early stages. The research remains inconclusive as of the writing of this article. According to early WHO reports, "There are no adverse effects related to exposure to wireless technology. As the frequency increases, there is less penetration into the body tissues, and absorption of the energy becomes more confined to the upper tissue of the body (skin and eyes). Tissue



heating is the main mechanism of interaction between radiofrequency fields and the human body. Radiofrequency exposure levels from current technologies result in negligible temperature rise in the human body".

As for the environment, there are several points in favour of this new generation of networks. For example, the International Union for Conservation of Nature uses 5G geolocation technology to track the location and movements of endangered animals. Researchers believe 5G will use less energy while transferring heavy data, making it energy friendly. 5G linked with the Internet of Things (IoT) will also bring energy usage down as it will enable devices to power up and shut down automatically when not needed.

According to the Environmental Protection Agency (EPA), an independent executive agency of the United States Federal Government, U.S. households waste one trillion gallons of water annually due to leaks (62 million gallons being the official statistics for India). Automatic water sensors powered by 5G can detect water leaks, pollution and contamination. The Government of India has not collected any official data on the cost of healthcare and the environment affected by the 5G, and neither has WHO (India-specific data).

In other spheres, 5G can immensely help enhance the human experience. The hospitality and entertainment industry can provide excellent services with their existing technology. However, a faster network will only help these markets. 2020 saw the rise of OTT platforms and online games - we can only expect it to work out positively for the entertainment industry.

The manufacturing industry can expect increased productivity as well. Farmers can better monitor their crops and livestock and improve water management with the right tools. The financial sector could provide personalized products/assistance and improve services for remote customers.

To sum up, 5G has promising future benefits for industry and commerce. However, as rational consumers, we must also weigh the costs attached to this development. As expected on the path of progress, costs initially rise but fall in the long term. The current expenditure, as reported by CRISIL, will be in trillions of dollars to successfully implement this technology. The future returns still remain to be ascertained with precision.

It is also noteworthy that while metropolitan cities are set to step into the super-speed era, many areas in the country have not moved past the 2G network. Waseran in Kashmir, Lachung and Dzong in Sikkim, and Agumbe in Karnataka, for instance, still await to step into the age of the internet. Ironically, people who could most benefit from it are barred from accessing the web.



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POLICIES

PIVONNC

PLANE

DATA

"Analysing data is about making the invisible visible - The gender gap cannot be closed without closing the data gap."

FEMINISM

Crafting Evidence Based Policies: A Comprehensive Approach

By Shrishti Singh, Rhea Pandey

"If evidence-based policy is to do its job then, it is best to construe evidence widely enough to cover all the facts without which you will not have a good argument."

- Nancy Cartwright, Evidence-Based Policy: A Practical Guide to Doing It Better

The era of evidence-based policy in diverse areas of practice boiled up in the United Kingdom under the Blair administration. There were two objectives for the start of this revolution- First, the ingenuity of the medical trials whose applications were not grounded in empirical research. Second, the view of modern and reformed governing. The ideology for the policies was based on research, data & responses. From then on the idea became widespread across continents and was implemented in different versions. Administrators and scientists are the major factors for effective policy driving formulation. Though evidence-based policies have come a long way from the definition of simple evidence (Marston and Watts, 2003) to evidence's sole use considered inefficient, there's much more in-depth resolutions that need to be considered.

On similar lines, this article will shed light on the newly adaptive way of using EBP as an effective tool for framing policies in various fields ranging from the novice concept of data feminism to the public health sector and urban planning techniques.

EBP & Data Feminism

Modern society, in an attempt to strengthen connectivity to be able to share information, is a result of the benefits achieved by merging technology with the sincere use of data. When we talk about equality, righteousness, and opportunity, we associate it with feminism from a woman's purview.

The definition of Data Science eludes power and justice, which strives to question the government's actions, expose the wrongdoers, and improve the health status of a nation, amongst other factors. The comprehensive way to interpret this definition is what we famously called "Data Feminism". Whenever any primary data is collected as a sample, by the policymakers to formulate their policies by the way of Evidence-Based Policy Making, studies have shown that they tend to overlook some facts, for e.g., analyzing the distribution of power and privilege awarded to women at home and at places of work, and how the gender of a person influences his/her experiences and opportunities the world. in

This is when Data Feminism comes into the picture. This novice concept revolves around how to make the sample data an inclusive one, which offers strategies to data scientists who are keen to learn how feminism can help them work towards doing justice to the sample data collected, and for the feminists who are now focusing all their efforts on this emerging field of data science. Some of us may argue the need for feminism to be inculcated while policy formulation through evidence.

The answer is clear. Feminist theorists state that using different levels of analysis across intersecting axes like gender, race, and ability, amongst others, is necessary to ensure that policy-makers achieve what they strive for better politically informed and context-specific understandings of policy 'problems' and proposed 'solutions'.

Data scientists argue that inclusive analysis is important because it can uncover additional layers of complexity that are often overlooked. This contrasts with feminist advocate researchers who deny that evidence can be depoliticised. Data Feminism emerged when data scientists observed flaws in orthodox research methodologies that led to inaccurate and incomplete information about girls'/women's status and their representation in society.

The case study of evidence-based gender assessment projects undertaken by the Data-Pop Alliance (DPA) Foundation is really exciting to learn about. The DPA Foundation is a non-profit organization that brings together researchers, practitioners, and activists who want to "Change the World with Data".

Evolution of EBP in Various Sectors: *Public Health*

Why should EBP be restricted only to the field of research and law? It can actively be integrated with medicine and public health, which is known as Evidence-Based Public Health (EBPH) Policy Making. Evidence-Based (EBPH) involves Public Health making decisions based on the best available scientific evidence, engaging communities in decisionmaking, problem-planning techniques, conducting sound evaluation and propagating what is learned. Evidence for public health professionals includes qualitative and quantitative data, program results and policy evaluations, and the public health evidence is a complex cycle of observation, theory and experiments (Baker EL, 2005).

The best way to illustrate the benefit of EBPH is that it leads to the formulation of new and better policies, keeping in mind the needs of the present, thus, proving to be instrumental in changing a decade-old policy that has been standard all these years. An example that follows this is the alteration of guidelines pertaining to sudden infant death syndrome (SIDS). Previously, according to traditional recommendations, babies were required to sleep on their stomachs in case they vomited and choked in their sleep. But, in contrast to this idea, the recent research into SIDS has led to the recommendation that all babies now sleep on their backs until they turn 1 year old. The research done by the American Academy of Pediatrics recommends infants sleep on their backs on a separate sleep surface. Their objective for the study was to describe trends and actors related to breastfeeding and infant sleep practices in Georgia (sample state).

Pregnancy Risk Assessment Monitoring System 2004-2013 data were obtained from the Georgia Department of Public Health. Chisquare tests for trends were utilized to determine whether there were significant linear trends in breastfeeding and infant sleep over time and by survey phase. During that time between 2004-2013, the proportion of infants being placed back to sleep slightly decreased (though not significantly), from 59.7 to 48.9%, because of a significant increase in breastfeeding from 2004 (31.3%) to 2013 (81.7%). The proportion of mothers who reported never bed-sharing increased significantly from 26.7 to 45.1% over this period. Their results suggest the need for targeted education and support for breastfeeding and safe sleep practices (preferably babies sleeping on their backs).

The implementation of EBPH is a huge task within itself. Firstly, evidence is generated from biomedical research and is synthesized into a compact form. The next step involves formulating clinical policies based on the evidence so collected. Thereafter, research evidence is clubbed with a patient's (from the sample) clinical circumstances, preferences and values to arrive at a meaningful conclusion. However, very few individuals in the public health practice have been trained to utilize the evidence-based approach appropriately (Am J Health Promot 2001; 15(5):391-396).

The most important challenges faced by public health agencies using the EBP approach are rigid organization culture, poor workforce training, cultural and geographical differences (use of EBPH is limited in developing countries and such policies are mostly developed by the Western world), and limited funding. Policymakers are at a crossroads with other stakeholders when choosing and implementing evidence - based approaches.



Urban Planning

The pandemic and global awareness of climate change have significantly shifted our perception of how our living environment should be like. New concepts such as the 15-minute city, Blue Zone, and Active City have become increasingly popular, and urban development products such as evidence-based planning (EBP) tools have been consistently transforming to provide relevant urban planning data. EBP tools and their ability to glean meaningful insights from urban data are necessary for sound planning that will improve a city's metabolism, strengthen its resilience and allow it to anticipate and respond to future needs.

Two city projects in Vietnam undertaken by the Urban Planning team were developed using EBP tools, with a focus on conceptualisation and design validation. The projects in Hung Yen Province, Da Nang City and Nha Trang City, addressed the themes of nature, the adoption of digital twin technology and wellness development. The Nha Trang Master Plan leveraged EBP tools such as spatial syntax analysis and customized spatial analysis and modeling toolkits in the early design stages to help gauge efficient ways of maximizing space for optimal economic performance. Space syntax is a set of techniques for analyzing spatial layouts and human activity patterns in buildings and urban areas, trying to explain calculating and quantifying spatial relationships in built environments on all scale levels. A modeling toolkit is defined as a symbolic equation-based modeling system that allows for composable transformations to generate stable, efficient, and parallelized model implementations.

An example of combining planning concepts with the use of data explored by the CPG Corporation Urban Planning team is the area of recreational green distribution. In this case, measures were devised to define the performance of parks in maximizing value. Through EBP tools, CPG determined that purposeful small green parks are more successful in attracting visitors and generating activity than large green areas. Using planning parameters and scoring land synergies, pedestrian traffic and major public open spaced location, their team derived a heat map showing the accessibility and purposefulness of the green areas. This understanding then enabled the team to optimize the size of green spaces and curate models for maintenance and upkeep.

Based on the evidence presented and upon exploring different facets of EBP techniques, the logical conclusion seems to be that EBP has highly contributed to the shift in policy-making methodologies in various spheres. It has helped in transforming the standard societal norms to undergo the required changes, thus enabling policy-makers to arrive at more accurate data analysis and smoothen the process of making inferences.

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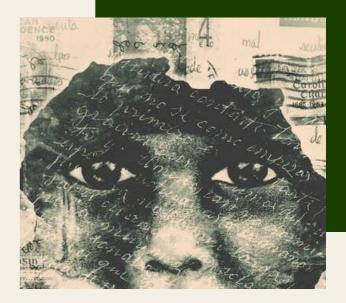
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HOW THE WORLD IS COUNTING ON EBP FOR POVERTY ALLEVIATION



by Jyoti Khetwal & Rhea Pandey

"So at the end of the day, although we will try to stitch together the best evidence for these theories, the result will be tentative. We have already seen that growth is hard to measure. It is even harder to know what drives it, and therefore to make policy to make it happen. Given that, we will argue, it may be time to abandon our profession's obsession with growth."

vidence-based policy (EBP) has become a powerful tool for addressing poverty around the world. Poverty is not simply a matter of income; it is a multifaceted challenge that encompasses factors such as access to healthcare, education, and social services. Effective poverty alleviation requires a comprehensive understanding of these complex dynamics, as well as the ability to design interventions that address them in a targeted and effective manner. With this knowledge, they can design interventions that are tailored to the specific needs of the communities they serve, ensuring that resources are allocated in the most effective and efficient way possible.

Targeted Poverty Alleviation (TPA) Policy in China

China is currently growing at the fastest pace and is considered the largest developing country in the world. However, prior to this achievement, it happened to be the home to the largest rural poverty-stricken population (Liu et al., 2018), which has hampered its social and economic development. The Targeted Poverty Alleviation Strategy was officially adopted by the Chinese government in 2014 to lift the 70.17 million population out of poverty (Zeng, Qingjie, 2020). The main aim of such a policy was to achieve the goal of first targeting anti-poverty from national levels to village and household scales. The Chinese government has spent over \$80 Billion to end this cycle of poverty in the nation (Wang et al., 2007).

Many of us are left wondering about the foundation principles of this policy. The answer lies in the report published by the World Bank, called "Four Decades of Poverty Reduction in China: Drivers, Insights for the World, and the Way Ahead", which states that China's approach to poverty reduction has been based on two pillars. The first one was based on broad-based economic transformation which was instrumental in raising the average per capita income levels. The second was that the government recognised that targeted support was essential to alleviate tenacious poverty; therefore, support was initially provided to those areas that were disadvantaged in terms of geography and lacked opportunities and later to individual households.

China felt the need to adopt TPA mainly due to two reasons, first, there was hardly any income equity and second, even though China had opened up its economy and brought in new reform measures, not everyone benefited from the resulting economic growth.

Breaking down the successful implementation of such policies, we should be aware of how the Chinese policymakers began this approach in the first place. A quantitative analysis of the panel data of 21 districts in Chongqing City in the Three Gorges Reservoir region from 1998 to 2015 was conducted to determine the influence of China's focused poverty reduction policy in terms of causal inference.

The outcomes showed that: (1) China's state policy for specific poverty mitigation has a substantial impact on reducing poverty, which was observed from the beginning, namely, peasants' net income per capita from 2011 to 2013 increased by 13.9%, as compared to that during 2008–2010, thus hinting on poverty reduction. Meanwhile, the net earnings of each farmer grew by 22% from 2011 to 2015 throughout the implementation phase of the policy, as opposed to that from 1998–2010. (2) Economic behavior in the marketplace and agricultural output figure of impoverished regions has significantly improved farmers' individual net income. Based on these findings, it is proposed that China should increase investment to consolidate its poverty alleviation policy in the most poverty-stricken areas, activate rural markets and develop agricultural production at the local level to accelerate poverty reduction in the region.

As per The Diplomat's report, over 100 million people in China's rural areas were lifted out of poverty. However, all this wasn't possible without impeding challenges, for eg, TPA was unable to resolve the underlying causes of rural poverty, and about 63 per cent of students in rural areas leave school before finishing high school, due to a lack of early childhood education, more than half of rural children are developmentally stunted, putting them at risk for malnutrition. Nonetheless, the final war against extreme poverty has been won by China. The natives have made efforts to have a better living standard and shared wealth by achieving the aims of the poverty elimination campaign as planned.

Conditional Cash Transfer Programs in Brazil

During the 90s, Brazil faced one of the world's highest levels of income inequality and a steep gap between the poor and non-poor in access to basic human development services. As a result of such inequalities, economists observed gaps in human development outcomes, such as educational levels and health and sanitation. To tackle such an issue, the Brazilian government introduced the Conditional cash transfer (CCT) programs known as Bolsa Família Program (BFP) which became effective in 2003.

Do you know how the Brazilian Policy Makers curated this poverty alleviation scheme and how they saw the scope for it in the future?

Well, the answer lies in the way the policy is designed. The basic principles of this scheme lie in an integrated approach that coordinates the public services like health, education, food security, labor, social assistance and economic development services provided for the specifically targeted families. This approach is also decentralized in a way that municipal corporations play an active role in identifying the actual beneficiaries of the programme, determining eligibility with conditionalities, and ensuring the delivery of health and education services.

The Brazilian policymakers targeted families with per capita income below the poverty line, according to household surveys. Next, they set quotas on the number of recipient families at the municipal level, after they had analyzed the number of families below the poverty line. The scholars then conducted mean tests and comparative analyses with other databases and administrative datasets.

Talking about how successful this policy was, we should look at its strategy. Bolsa Família had a goal of rapid and universal coverage of the poor (Lindert K, 2007), and no evaluation strategy was in place when the program was implemented. Therefore, not much is known about Bolsa Família's impact on consumption, poverty, health, and education (Fiszbein A, 2007). The important takeaways from this policy for other developing nations can be seen in the improvement in healthcare facilities, especially those related to rare health conditions. But there is still a long way to go for Brazil to achieve a sustainable level of living for all its citizens.

Abhijeet Banerjee and EBP

Abhijeet Banerjee is a well-known economist who has made significant contributions to the field of development economics. He is particularly recognized for his work in the area of Evidence-Based Policy (EBP), which emphasized the importance of rigorous empirical research in designing effective policies and programs for poverty alleviation.

One of Banerjee's major contributions to economics is his emphasis on evidence-based policy (EBP). Banerjee believes that policies and programs aimed at reducing poverty should be based on rigorous empirical research, rather than on intuition or ideology. approach EBP involves His to using randomized controlled trials (RCTs) to evaluate the impact of various interventions, and policymakers should use these evaluations to inform their decisions.

He and his colleagues at J-PAL have used RCTs to evaluate a wide range of interventions, including microfinance programs, education initiatives, and health interventions.

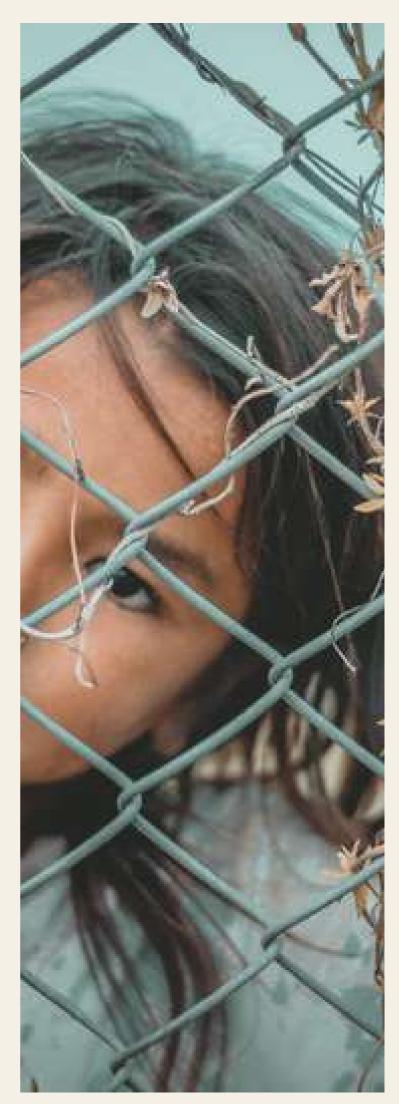
For example, the research paper "The Miracle of Microfinance?: Evidence from a Randomized Evaluation" by Abhijit Banerjee and his colleagues conducted an RCT to evaluate the impact of microfinance on poverty reduction in India. They found that while microfinance had some positive effects on the lives of borrowers, it did not have a significant impact on poverty reduction overall.

The research paper Mainstreaming an Effective Intervention: Evidence from Randomized Evaluations of "Teaching at the Right Level" in India by Abhijit Banerjee, Rukmini Banerji, James Berry, Esther Duflo, Harini Kannan, Shobhini Mukherji, Marc Shotland, and Michael Walton, provides compelling evidence on the effectiveness of the "Teaching at the Right Level" (TaRL) approach to improve learning outcomes for primary school students in India. The study uses rigorous RCTs to evaluate the impact of TaRL interventions on student learning outcomes and finds that the approach is highly effective in improving basic numeracy and literacy skills among students.

Banerjee's work on EBP has also led him to advocate for policies that are designed for the specific needs of the poor. In his book "Poor Economics", Banerjee argues that policymakers should take into account the complex social and economic factors that perpetuate poverty when designing interventions. His brilliant work through the utilization of EBP, has been widely recognized, and he has received several awards for his contributions to the field. In 2019, he was awarded the Nobel Prize in Economics, along with Esther Duflo and Michael Kremer, "for their experimental approach to alleviating global poverty".

In conclusion,

Abhijeet Banerjee's remarkable work on EBP has significantly impacted the field of development economics. His emphasis on rigorous empirical research, particularly through has RCTs. challenged conventional wisdom and led to more effective policy interventions to reduce poverty. Banerjee's work has also highlighted the importance policies designing that of consider the complex social and factors economic that perpetuate poverty.



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WHEN YOUR LIFE MEETS EVIDENCE-BASED POLICIES

by V Praveenaa & Jyoti Khetwal

"At the heart of the evidence-based policy is the desire to ensure that public resources are used in a way that maximizes their impact for the benefit of all citizens, particularly those who are most vulnerable."

- Michael Barber



Evidence-Based Practice (EBP) is a systematic approach to decision-making that involves the integration of the best available evidence to inform decision-making and evaluate the outcomes. EBP has been shown to improve outcomes, enhance quality, and optimize resource utilization in each of these sectors. With advancements in technology, EBP is evolving to incorporate artificial intelligence and machine learning techniques to analyze large data sets and identify patterns. By using research-based strategies and interventions to guide decision-making, organizations can make informed choices that are more likely to achieve their desired outcomes. In this article, we will explore how EBP is applied in different sectors- education, AI, healthcare, agriculture and soil management; and its impact on decision-making and outcomes in the context of India.

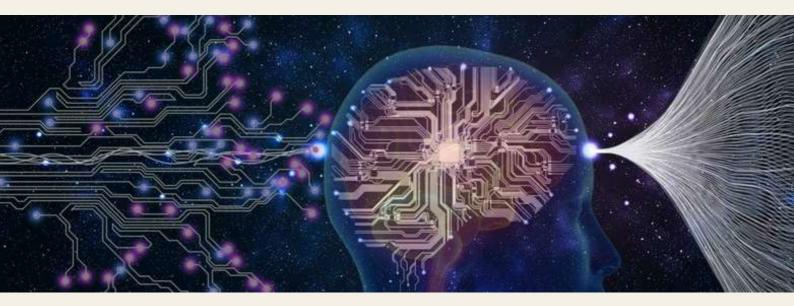
Evidence-Tech Amalgamation Improving Education

Observing the incentives of promoting schooling among kids, food emerged as the bright spot, as poor families can neither afford food nor education. Thus to promote universal education, a mid-day meal scheme was launched to provide both health and education at the same time solving two major problems of increasing dropout rates and child labour in one shot. The scheme was introduced as early as 1956, by 1982 the state provided a daily free nutritious meal of 400-odd calories to 62.4 Lakh poor students in the age of two to ten years, leading to an exponential growth of a whopping 44% increase in literacy rate within two decades as claimed by S. Irudaya Rajan and A. Jayakumar in Economic and Political Weekly published in October 1992. Additionally, according to the Census Data, the child labour figures in the state has came down from 9.75 Lakhs in 1981 to 1.51 Lakhs in 2001. A state-level policy turned international,

as 80% of countries have a school feeding policy, and have the world's most extensive social safety network.

In modern-day India, the importance of a developed education sector is equally pivotal. Setting the context, as laid by the National Strategy for Artificial Intelligence #AIFORALL published by NITI Aayog in June 2018, states that currently over half the population of the country is below the age of 25, also even after having Gross Enrolment Ratio (GER) at 80% at the secondary level, the Retention rate at the secondary level is appallingly at 57.4%, to curb these issues AI is used. It is estimated that schools globally spent nearly USD160 billion on education technology, or 'EdTech', in 2016, and forecast spending to grow 17% annually through 2020. Private investment in educational technology, broadly defined as the use of computers or other technology to enhance teaching, grew 32% annually from 2011 through 2015, rising to USD 4.5 billion globally. One of India's leading EdTech startups Byju raised USD 40 million from Tencent in July 2017, just four months after raising USD 30 million from Belgium-based Verlinvest. In the context of ed-tech companies, EBP refers to the use of researchbased strategies and interventions to improve educational outcomes.

Firstly, by developing educational products and services that are based on research and have been shown to be effective, companies differentiate themselves from their can competitors and establish themselves as trusted providers of high-quality education. Then, ed-tech companies can use EBP to improve the outcomes of their existing services. By continually products and evaluating the effectiveness of their offerings, companies can enhance the value of their products and services and increase customer satisfaction. Finally ed-tech companies can use



EBP to develop new products and services that address emerging educational needs and trends. By staying upto-date with the latest research and trends in education, companies can identify gaps in the market and develop innovative solutions that meet the needs of educators and students.

AI-Driven National Data and Analytical Platform

EBPs are also not far behind in coping with emerging tech trends like artificial intelligence throughout divergent areas like healthcare, agriculture, transportation, and education, which are also the key interest of the National Artificial Intelligence Mission launched in January 2020 by the Ministry of Electronics and Information Technology and NITI Aayog. On a macro-scale, AI and machine learning have had a disruptive impact on several sectors including agriculture, retail, healthcare, and education amongst others. In line with the potential of AI, spending on AI and machine learning has been on a steep upward curve. Al expenditure in India saw an increase of 109.6% in 2018 to reach US\$ 665 million. Moreover, Al expenditure is projected to grow with a CAGR of 39% over the period 2019-2025 touching around US\$ 11,781 million by 2025.

Artificial intelligence (AI)techniques have been commonly used to track, predict early warning, forecast trends, and model and measure public health responses. Statistics, involving data. is the foundation of policies evidence-based that have traditionally been used to track public health crises. Almethods. enabled such as machine learning and deep learning-based models. have exploded in popularity recently, complementing statistical approaches.

Artificial intelligence's intelligence grows with data, finds patterns in data, to say, figures out what a chair looks like after analyzing thousands of pictures of furniture simply put, Al is driven by data, and hence data is required to be protected and organized. A key project of NITI Aayog is the National Data and Analytics Platform (NDAP), which aims to increase public data usage and accessibility. A real-life example of EBP in NDAP by NITI Aayog is the use of data analytics to improve crop yield and optimize the use of resources in agriculture. NITI Aayog used NDAP to collect and analyze data from various sources, including weather data, soil data, crop data and the optimal use of resources. Another example of EBP in NDAP by NITI Aayog is the development of the India Energy Dashboards. These dashboards are a part of the India Energy Modelling Forum (IEMF) and provide real-time data and analysis on the energy sector in India.

Evidence in Indian Healthcare

India sees an incidence of more than 1 million new cases of cancer every year according to the National Cancer Registry Programme, also the report of National Strategy of Artificial Intelligence of NITI Aayog stated that India has barely 2,000 pathologists experienced in oncology and less than 500 pathologists who could considered be an expert Oncopathologist. Machine learning solutions aimed at assisting a general pathologist in making a quality diagnosis can very well plug this gap in providing essential healthcare. Digital Pathology one such solution-oriented project entails all glass slides generated being scanned at high resolution and magnification, followed by accurate, precise and comprehensive annotation of the scanned images using various data sources & levels of clinical & pathological information available from day-to-day patient care.

Indian digital pathology market is growing at a CAGR of approximately 21.5% during the forecast period. India is providing significant opportunities in the healthcare sector and the digital pathology market is expected to experience an increase in demand for patient safety, precision in diagnostic and quality improvement which is emphasizing on development of technology and systems which is highly specialized for pathology services.

Agri Start-ups and EBP

The Evidence-Based Policy has been very evident in the agriculture sector in India where surprisingly in 2016, according to The Economics Times's report on Indian startups in 2022 approximately 50 Indian agricultural, technology-based startups ('AgTech') like SatSure, Intello Labs, Trithi Robotics, and Aibono raised USD 313 million and are working on projects like Soil Health monitoring and restoration, AI sowing app, AI for herbicide optimization and AI for Precision Farming.

• Soil Health Monitoring

Berlin-based agricultural tech startup PEAT has developed a deep learning application called Plantix that reportedly identifies potential defects and nutrient deficiencies in the soil. The analysis is conducted by software algorithms that correlate particular foliage patterns with certain soil defects, plant pests and diseases. The image recognition app identifies possible defects through images captured by the user's smartphone camera. Users are then provided with soil restoration techniques, tips and other possible solutions.

• Al Sowing App

Microsoft in collaboration with ICRISAT, developed an AI Sowing App powered by Microsoft Cortana Intelligence Suite including

Machine Learning and Power BI. The app sends sowing advisories to participating farmers on the optimal date to sow. The best part - the farmers don't need to install any sensors in their fields or incur any capital expenditure. All they needed was a feature phone capable of receiving text messages. The advisories contained essential information including the optimal sowing date, soil test-based fertilizer application, farm yard manure application, seed treatment, optimum sowing depth, and more. In 2017, the program was expanded to touch more than 3,000 farmers across the states of Andhra Pradesh and Karnataka during the Kharif crop cycle (rainy season) for a host of crops including groundnut, ragi, maize, rice and cotton, among others. The increase in yield ranged from 10% to 30% across crops.

• Al for Precision Farming

NITI Aayog and IBM have partnered to develop a crop yield prediction model using AI to provide real-time advisory to farmers. IBM's AI model for predictive insights to improve crop productivity, soil yield, control agricultural inputs and early warning on pest/disease outbreaks will use data from remote sensing (ISRO), soil health cards, IMD's weather prediction and soil moisture/temperature, crop phenology etc. to give accurate prescriptions to farmers. The project is being implemented across the States of Assam, Bihar, Jharkhand, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh.

In conclusion, Evidence-based policy has helped achieve milestones in various aspects. The use of evidence-based practice has the tremendous potential to positively impact the quality of care and services provided in many sectors, ultimately leading to more effective and efficient practices and better outcomes for organizations individuals and alike. As knowledge and research continue to evolve, the use of EBP will become even more critical to ensure that the interventions and practices used are based on the most up-to-date knowledge and evidence.

If EBP is to become something other than a passing fad then more attention must be paid to research and evidence applicable in the real world rather than an ideal world.

'There is nothing a government hates more than to be well-informed, for it makes the process of arriving at decisions much more complicated and difficult.'

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BEHAVIOURAL FACETS TO SUSTAINABILITY

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GREENING THE ECONOMY: THE MULTIPLIER EFFECT OF SUSTAINABLE INVESTMENTS







By Nikita Bhardwaj and Prachi Ankoti



The first substantial step towards achieving sustainability was marked by the Paris Agreement in 2015 when 195 countries legally committed themselves to extenuate the global issue of Climate Change. Since then, we have only witnessed a surge in international pledges integrate sustainability in their to respective economies. This has provided researchers with the opportunity to dissect the concept of 'green budgeting' and its paradigms. The Organization for Economic Co-operation and Development (OECD) identifies green budgeting as "the use of budgetary policy-making to achieve environmental and climate goals". According to them, green spending can occur at a large scale only if four building blocks are ensured, namely; a strong strategic framework, means for evidence generation and policy coherence, ensuring accountability through transparency, and budgetary governance enabling an framework. Therefore, this calls for responsible resource management and allocation by the governments.

The International Panel on Climate Change found that to meet the 1.5-degree Celsius target, it would take a total investment of US\$1.6-3.8 trillion per (in 2010 dollars) year to 2050 from public and private sources to transition just the world's supply-side energy system, excluding the various transitions required in industry and agriculture. A limitation faced by researchers in the quest of understanding green spending is the insufficiency of data. As of now, most of the conclusions reached come from databases of various international energy universities, NGOs. agencies, and multilateral development organisations.

During the Covid Pandemic, the International Monetary Fund (IMF) found that there was an unprecedented 6.4% decline in carbon emissions, due to the pause in human activities. However, this unsuitable trade-off sent countries into disarray, as we witnessed the loss of jobs and livelihood, the global breakdown of health sectors leading to 2 million lives lost, and much more. Since then, countries have been working to regain sight of normalcy and to "Build Back Better" (Batini et al., 2021). The working paper of IMF asserts that a more advantageous post-Covid recovery can be made by investing in green infrastructure. We should be creating transitions by refining the two broad areas of Clean Energy and Ecosystem Conservation.



Further in the paper, in an attempt to quantify the share of green spending in an economy's gross domestic product (GDP), the authors express that every dollar (private or public) spent on carbon-sink activities can generate more than a dollar's worth of economic activity, it triggers as the Economists identify the multiplier effect.

Their striking findings claim that the multiplier effect derived from green budgeting can be 2 to 7 times larger than that of non-eco-friendly expenditures if the right sectors and technologies are targeted. 86% of this variation in green and non-green multipliers accounts for the difference in the initial stock of public capital wherein green investments are far away from the steady state (Hasna, 2021).

Investing in clean energy implies financing pursuits of research into such technologies that will make extraction of cost and environmentenergy, friendly.Currently, low-carbon emitting countries like France and Sweden heavily rely on nuclear energy or hydroelectric energy to meet their power requirements. Even though nuclear energy is considered to be the most fuel-efficient source in the of non-renewable category energy (sources that are non-replenishable), it is not a viable option. This necessitates that governments overcome technological barriers that stand in the way of obtaining

energy from renewable sources and enabling a vital ecosystem, which can only be ensured through a continuous flow of funds. Moreover, green spending has been with associated generating higher employment opportunities in an economy, renewable energy industries are as considered to be more labour-intensive. This is in contrast to fossil fuel technologies or other non-renewable options that are highly mechanised and capital-intensive.

Based on a meta-analysis of 13 countries, *Kammen et al.*,(2004) concluded that renewable energy portfolios create more jobs than fossil fuel-based portfolios, per unit of energy delivered. Further studies by *Wei et al.*,(2010), and *Blyth et al.*,(2014) have confirmed the same findings. Other studies that measured the number of jobs created per unit of capital investment have also confirmed the aforementioned results.

Data shows that a million euros of capital investment created 17 jobs in energy efficiency and 10-14 jobs in renewable energy versus 2.4 in oil and 3.6 in gas (Spencer et al. 2012). Studies have also established the spillover effects of employment in the green sector. One additional job in forestry generates an additional 1.5-2.5 full-time employment jobs in the wider economy (Nair and Rutt, 2009) These spillover effects are partly attributed to the savings in energy costs which are reinvested in the economy and further create more jobs. However, some studies have suggested that in the longer run, there might be a negative effect on since employment renewable infrastructure has minor maintenance requirements.

Green investments made by economies during recessionary periods can achieve both economic and environmental objectives. Some early recessionary spending programs, for instance, Roosevelt's New Deal introduced the Corps, Civilian Conservation which planted more than 2 billion trees that slowed erosion, and altered more than 118 acres of land along with employing men when three million young unemployment was soaring at 25%. 15.6% of the fiscal spending post the global financial crisis (2008) was green (Robins et al., 2009)

The American Recovery and Reinvestment clean energy Act's (ARRA) package successfully stimulated the economy by creating jobs and paving the way for a long term green investment. The spending provided a boost to the green energy supply chain and supported long-term opportunities for green labour. To understand the impact of green spending on a microeconomic level, we will look at the impact of corporate sustainability performance (CSP) on corporate financial This performance. linkage provides conclusive evidence that the pursuit of profit and sustainability can go hand in hand.

Thus, the motive of corporate social responsibility (CSR) today has transitioned from philanthropic to strategic. It is being used to paint a positive image of a compensate for the company to environmental/ social damages caused by its activities. The shareholder theory by Friedman focuses on economic incentives only but the stakeholder approach by Freeman focuses on economic, ecological and social capital suggesting a change in the objectives of a firm. This shift in behaviour has led to the emergence of corporate sustainability. Good CSP is a valuable asset to a company as it enhances its value in the product market as well as makes it more lucrative to investors. In addition, spending on environmental sustainability contributes more to financial performance than social sustainability (Lu and Taylor, 2015).



The majority of the literature suggests a positive relationship between corporate ecological performance and its financial performance but some studies suggest that this linkage also depends on contextual factors such as company size or the industry. Moreover, the positive relation is more profound in the B2B (business to business) sector compared to the B2C (business to consumer) sector. This indicates that the awareness of plays major consumers а role in determining the extent of the effect of CSR on financial performance. Thus, firms can earn greater profits by making green investment decisions as part of their CSR to generate additional value for their consumers. To conclude, green spending induces a higher multiplier effect both at the macroeconomic and microeconomic levels than the conventional forms of

investments which results in crowding out other domestic spending. of lt is associated with larger economic gains like higher employment generation, better financial performance for corporates and a two-fold recovery from an economic downturn achieving both environmental and economic objectives. Thus, the private sector can fulfill its role towards the environment without worrying about reduced profits. Moreover, given the huge investments required to achieve climate goals, it is beneficial for the governments to fulfil both economic and environmental demands by investing in the green sector. To inform future decision-making for green investments, policymakers should rely on policy impact assessments to better understand the yield of every fiscal investment, taking lessons from the policy responses during Covid 19 or the global financial crisis.

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ROAD TO SUSTAINABILITY: A BEHAVIOURAL ECONOMICS APPROACH -By Nikita Bhardwaj

Ecological degradation has become more severe than ever and despite efforts at the global level, the pace of reversal is acutely insufficient. Agreeably, many people express concern about the environment but this concern has not yet translated into action.



Therefore, it becomes the need of the hour to overcome this intention-behaviour gap, a result of the inherent human biases, one being time discounting. This tendency to prefer immediate gains over larger delayed gains explains the deviation from the pro-environment attitude.



Consumerism has become a hallmark and the predominant reason for the huge surges in demand and depletion of resources leading to anthropogenic disruptions of the ecological system. Today, we stand at the inflection point where the cost of growing the economy is actually larger than the benefits accompanying economic growth, a condition referred to as **uneconomic growth**. Cognitive bias has a significant influence on purchases. our day-to-day Moreover, marketing campaigns target consumers by focusing on their psychology and behaviour. Practices like planned obsolescence to encourage mass consumption and a lower propensity to reuse products are an increasing threat to sustainability.

Behavioural economics understands the cognitive distortions in human behaviour and uses them to nudge people to align their behaviour with their mindset. It delineates the decision-making process of an individual in a real-world setting through an economic lens without perceiving them entirely as rational beings. Human decisions often rely on heuristics, reducing the cognitive effort in making decisions partly consciously and partly automatically.

Decisions are also governed by social heuristics, the behaviour of the majority and moral judgments. Despite knowing the environmental impact of plastic bags, buying imported goods rather than local produce, etc, many would still not nudge their behaviour towards pro-environment practices. reflecting status auo and familiarity bias. Such automatism and psychological biases pervasive in human behaviour make pertinent the use of behaviourally informed instruments to facilitate a green lifestyle.



Insights from behavioural economics can help policymakers better understand the existing consumption patterns and design more effective policies.

Nudges refer to the subtle alterations of the environment to trigger the automatic cognitive processes to reach the desired outcome. Nudging is, however, not a coercive approach instead it sets the framework for the general well-being of society with the aid of choice architecture which sets out to modify the environment by manipulating psychological biases to encourage socially desirable behaviour. Following are some examples of nudges to incentivise sustainable behaviour:

The Status Quo Bias

A tried and tested method to promote pro-environment behaviour is by making them the default option. The default choice acts as a 'soft' recommendation and an individual would not deviate to an alternate choice without a reasonable justification. Moreover, humans tend to go with the status quo to cut on the time required in exploring alternate options thereby reducing cognitive effort. Thirdly, people refrain from switching from the default option due to the loss aversion because individuals nature give more weightage to a loss than a commensurate gain, wherein a loss is counted from the reference point which is established by the default rule. Therefore, sustainable choices as a default option have a strong impact on consumer choices especially when these choices need stronger motivation. Green defaults have proved efficacious in several areas like choosing an electricity provider, reducing food wastage by providing smaller plates and serving spoons at hotel buffets and attracting consumers by including more attractive pictures of vegetarian meals and items containing local produce.

The social heuristics

The tendency to conform to societal trends can be effectively used to redefine social norms in the context of sustainability. Even a minority holds the power to change behavioural patterns by exerting significant influence. An example from California shows how the tendency of societal comparison encouraged people to switch to fans from air conditioners. The following four types of notes were placed on residents' doors to advertise against air conditioners- first threw light on reduced electricity bills, second talked about the environmental benefit, third stressed the energy efficiency of fans whereas the fourth highlighted fans as the most popular choice in the neighbourhood. The last message yielded the most significant results in changing consumption patterns. Thus, a dominant social norm will have a contagious effect on the rest of the people of the population. However, since such choice architectures are quite meticulous, their application at a large scale often becomes difficult.

Fairness and Reciprocity

Experiments have suggested that an innate moral compass guides an individual's behaviour in social interactions. Studies have shown that most women refrain from negotiating their initial salary offer often due to their sense of suppressed entitlement. However, the odds of having fairer remuneration among those who negotiate are very high. This is because judgments of fairness alter the way we allocate resources and hence it can be useful to narrow the gender wage gap according to preliminary research. This situation is considered 'The analogous to the Ultimatum Game' played between two players. The first player will divide a certain amount of money with the second player and the latter will choose to accept or decline the offer. If the offer is declined neither player gets any amount of money. Neoclassical economics would assume that the first player should send the minimum possible amount to the second player. However, it was found that mostly the first player offers a larger share, approximately 50%, to the second player and the latter mostly refuses the offer if the share is less than 20%.

Framing of Information

Communicating the piece same of information differently can lead to different outcomes. Framing of options in positive terms, as gains or in negative terms, as losses can have different impacts, for instance, saying that a bottle is made up of 40% recyclable material is more impactful than saying that it is made up of only 60% new plastic.

Highlighting the negative consequences of avoiding an action rather than the positive consequences of undertaking it proves to be more encouraging for consumers to engage in sustainable behaviour. Moreover, framing consumer products appropriately like mentioning the environmental footprint are effective means to encourage sustainable consumption.

Commitment bias

The tendency to be consistent with what we have already done especially if this is a public commitment is known as commitment bias. In Cape Town, a finance company reduced water consumption by 35% by incorporating water targets into management performance targets which employees are already committed to.

Behavioural feedback

people detailed Giving and accurate information about their performance can be very motivating to nudge them towards desired behaviours. Providing in-situ feedback rather than after the completion of the behaviour has proved to be the most effective. For instance, Virgin Atlantic Airlines worked with behavioural economists from the University of Chicago and the London School of Economics to provide tailored feedback to the pilots on their fuel consumption relative to peers which reduced carbon emissions by 21,500 tonnes.

behavioural economics thus provides a scientific tool to nudge consumption towards patterns sustainability by leveraging human biases. Such interventions are cost-effective and are a soft approach that ensures that the sustainable choice is the easiest one to make. One reason for the failure of extensive environmental laws today is their inability to understand the human decision-making process. Montreal Protocol, one of the most successful environment conventions to date. manoeuvred practices of behavioural economics like setting green defaults and encouraging customers to buy safer products through green tags. Industries initially opposed the controls on CFCs but when one of the major players decided to comply in 1986, others followed. The Principle of loss aversion was utilised by increasing awareness about the risks of skin cancer due to ozone depletion. In addition, the protocol was perceived as sufficiently fair to encourage participation as it ensured that all countries had the financial means to implement its provisions. With the aid of behavioural economics, the efficacy of environmental laws and treaties can be increased manifold. Incorporation of behavioural economics into environmental and public policy thus becomes indispensable to bridging the attitude-intention gap to address the worrisome state of the planet's health.

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Productivity and Soaring Conflicts: Is Climate Change to be Blamed?

-Muskaan, Rashi Diwan

With climate change becoming one of the most pressing issues of our time, it is being considered to have a significant impact on global productivity. As temperatures rise and weather patterns become more extreme, events like droughts, floods, etc also become increasingly frequent. These conditions can have a substantial effect on our capacity to create goods and services, generate economic growth as well as maintain global peace. In this article, we examine these increasingly evident influences of climate change on productivity and conflict.

Empirical results from research done in "Temperature and Labor Productivity: A Regional Analysis of Chinese Construction Enterprises" by Wang, H., & Li, Y. (2019) demonstrate that there is inverse U-shaped relationship between an temperature and labour productivity. This means that productivity decreases as temperatures rise above or fall below a certain temperature range. Studies show that productivity per individual workday is declining by 1.7 percent for each 1degree C rise in temperature above 15 degrees C, which can be attributed to factors such as increased discomfort, fatigue, distraction, etc caused by high temperatures in workplaces.

A major effect of this relationship can be attributed/observed from the agricultural sector. A 2018 study, for example, found that rising temperatures in India led to a 4% decline in crop yields, which can have a significant effect on the country's agro-based economy, leading to decreased income, higher poverty levels and increased conflict. Severe heat can cause various health-related problems among workers, such as heat-related injuries and even critical heat stroke, which directly affects per-worker productivity. Similarly, studies in the United States showed that a weekday above 30 degrees C (86 degrees F) costs the county an average of \$20 per person in lost income which can be a direct result of productivity decreased and increased absenteeism. A similar case is observed in Bangladesh, where rising sea levels and deadly floods are putting tens of millions of lives at risk with waterlogged land and high salinity in streams and soil causing agricultural productivity to decline rapidly. The country is also grappling with frequent natural disasters, such as cyclones and landslides, which further exacerbate the situation. In China, the country's agricultural productivity has decreased by about 6.3% since the 1980s due to climate change with a decrease in labour productivity of up to 4.5%.

It is projected to further reduce it by up to 10% by 2050. In addition, climate change is also expected to reduce China's industrial productivity by up to 5% by 2050, according to a study by the Chinese Academy of Sciences. In addition to the disruption of productivity by climate change, nations, and communities may find themselves in competition for resources, leading to armed conflicts, economic disputes, and even social divisions. Studies suggest that with the rise in temperature, there has been a significant alteration in weather patterns as well, resulting in extreme climate occurrences. These changes create an environment of uncertainty and competition for resources that can lead to conflict at both international and regional levels. According to a World Bank report published in 2018, with every 1degree increase in long-term, or extreme rainfall, interpersonal violence rises by 4% and inter-group violence by 14%.

Recent studies have made it evident that climate change can make consequential contributions in generating social conflicts and divisions. As extreme weather events become more common, communities may find themselves in competition for resources, such as food and water. This competition can lead to social unrest, as communities struggle to secure resources for their own use. For instance, climate change is having a significant impact on local conflicts in India, especially the increase in competition for water which has resulted in an increase in water-related conflicts, particularly in the northern and eastern parts of the country. Furthermore, rising sea levels and flooding are causing the displacement of coastal populations, leading to additional conflicts over land and resources.

In the Middle East, water shortages are frequent and conflict can be seen as a direct result of climate change. The prolonged Syrian conflict was significantly influenced by human-induced climate change. The region's extreme drought caused widespread migration and displacement, indirectly contributing to the collapse of the Syrian government. (Kelley et al., 2015) Similarly, in his article for National Geographic, Peter Schwartzstein talks about how in Iraq, the terrorist organisation ISIS capitalised on the turmoil caused by droughts and extreme flooding by recruiting farmers and other displaced people, which played a major role in its invasion of the country.

Furthermore, in Africa, loss of livelihoods, increased stress on natural resources, growing water scarcity, and an increase in climate-related human migration are all consequences of climate change. Along with the increase in already existing vulnerabilities, climate change has started to escalate tensions and violent conflicts between tribes.



Additionally, research in the USA has shown that with each additional increment in temperature, there is an increase in the incidence of interpersonal and intergroup conflict. This includes domestic violence, road rage, assault, murder, and rape and in cases of intergroup conflicts, such as riots, ethnic violence, land invasions, and gang violence, the average rise is 11.3 percent for every standard deviation rise in temperature.

Climate change also has the potential to create conflicts between nations. Countries may find themselves in armed

conflicts for resources as they attempt to secure more for their own use. Climate change can also lead to economic hardship, disturbing the global economy. For example, in the Caribbean, extreme weather events have caused significant economic losses, as tourism and other industries have been greatly affected.

There is also an evident connection between climate-induced conflict and a plunge in productivity. The civil war in Syria, with several other factors, for example, led to a sharp decrease in oil production, leading to a worldwide rise in oil prices. Likewise, droughts and extreme weather conditions can reduce agricultural production thus leading to a decrease in productivity. This not only affects the economic stability on a local level but have broader can repercussions for global productivity as well. Besides the losses in productivity, conflicts lead to under-utilisation of human capital and the associated rifts between countries may impede investment which further affects economic growth.

The discussions done so far in this article make it clear that climate change has a significant effect on human productivity and conflict. In several cases, climate change-induced conflict also reduces productivity to a great deal with a reduction in agricultural yields, workers' efficiency to produce, damage to infrastructure and increased resource scarcity, resulting in a negative effect on the world economy.

The problem of declining productivity can be majorly combated by technological innovation. Technological innovation may mitigate the adverse effects of temperature fluctuations by providing advanced equipment, thus helping enterprises maintain greater levels of labour productivity.

Since technology can take over a lot of tasks, the labour can concentrate more and have longer periods of uninterrupted work. Numerous studies have also demonstrated that the shift to a lowcarbon economy will lead to a net increase in employment, resulting in a significant rise in productivity as well. Increasing conflicts can be reduced by diplomatic talks between nations and communities so as to come forth with a model for rational and fair distribution of resources. Different nations can work as one unit to use the resources in a cautious manner.



As temperatures continue to rise, it is important to take steps to reduce greenhouse gas emissions, protect vulnerable populations, build and resilient infrastructure. more Furthermore, countries must work together to develop strategies to address the effects of climate change to ensure a more secure, sustainable prosperous future and for all. economies and communities alike.



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SUSTAINABLE CONSUMPTION IN A DIVERSE WORLD: A STUDY OF DEMOGRAPHIC FACTORS

- BY PARVI ARORA

"The greatest threat to our planet is the belief that someone else will save it." - ROBERT SWAN

The dynamic interplay of technological and socioeconomic advancements has compromised the natural environment. Air, water, land, and other natural resources are depleting, and the present environmental concerns such as global warming, acid rain, and the ozone layer reduction are causing significant public outcries.



Around the world, numerous campaigns have highlighted the problem of ecological degradation. These initiatives primarily focus on the subject of conservation of the environment, and they have had a significant impact on consumer behaviour.

The purchase of green products has come forward as an effective tool for protecting the environment. Moreover, the findings of several studies carried out around the globe indicate that consumers choose or reject items based on the products' environmental qualities. Some studies have shown that consumers tend to spend more on environment-friendly products.

Multiple researchers have looked into the significance of a consumer's demographic parameters, which include traits like age, gender, education, income, occupation, etc., in predicting their attitude toward green products. According to Grunert (1995), 40% of environmental harm was caused by consumer expenditures. home By choosing environmentally friendly items, consumers have the power to prevent environmental damage. Some studies suggest that better earnings, higher education and being a woman may lead to more environmentally conscious purchasing behaviour but there have been many contradicting pieces of research that prove otherwise.

India is a country with a diverse population of 141.72 crores (based on Worldometer elaboration of the latest United Nations data) and a number of environmental issues stemming from the structural transformation of its economy, including the depletion of energy intensive field cultivation. resources. urbanisation, poor waste management, loss of biodiversity, industrial pollution, and the growing amounts of non-biodegradable wastes (Jain & Kaur, 2004).

In a survey conducted on green purchasing behaviour by Vedatya Institute in Navi Mumbai, India, factor analysis showed that "Concern for health and environment" is the most significant factor influencing Indian customers' purchasing decisions, green followed by "packaging," "eco-certification," and "lifestyle" as the next three most significant factors. In a study on Australian consumers, R. D'Souza et al. (2007) discovered that various demographic factors play a major attitudes role in determining towards environmental labelling.

While researching Portuguese customers, de Paco et al. (2008) discovered that demographic variables majorly affect consumer purchase behaviour. Therefore, the study of factors such as gender, age, income, and education can perform a significant role in understanding consumer behaviour and its impact on the environment. This article makes an attempt to analyse the impact of these factors on sustainable consumption.

Gender

According to several studies, gender does not play an important role in buying behaviour towards green products. Mourad et al. (2012), in their study, concluded that there were no gender-specific differences while determining the preference for green brands. Likewise, Suplico et al. (2009) discovered that there is no connection between gender and green marketing in their study of college students in the Philippines. However, several other studies have shown a significant relationship between gender and green purchase behaviour. Many studies show that women tend to be more environmentally conscious and more likely to make green purchases than men. This is likely due to socialisation and cultural factors that have traditionally associated women with caring for the environment. Similar findings were made by McIntyre et al. (1993) and Banerjee and Mckeage (1994), who discovered that women are more environmentally

conscious and more likely to make green purchases than men. This is likely due to socialisation and cultural factors that have traditionally associated women with caring for the environment. Similar findings were made by McIntyre et al. (1993) and Banerjee and Mckeage (1994), who discovered that women are more environmentally conscious than men (cited in Laroche et. al. 2001). However, contrary to several studies in the West, a survey conducted in Egypt concluded men were more concerned about the environment.

Age

The findings of studies comparing age groups were rather inconsistent. Some studies showed that younger people are more ecologically conscious. This might be because younger people have grown up with greater awareness of environmental problems and are more likely to prioritise sustainability (Van Liere et al., 1981; Zimmer et al. 1994). However, there were other findings that showed that consumers over 55 years of age were the most frequent buyers of green products in the United States. Women over the age of 55 lead the way as typical consumers. In a study of Portuguese consumers based on demographics, knowledge, environmentally conscious purchasing behaviour, and other factors, researchers identified three consumer clusters. The age groups of 25-34 years and 45-54 years made up the majority of the group called "the green activists," which was defined as the most environmentally conscious age group.

Education

Despite the fact that the findings of studies focusing on education and environmental issues are somewhat more consistent than those of studies focusing on the other demographic variables, a firm relationship between the two variables has not yet been established. Most of the researchers have discovered the anticipated favourable relationship between education and green purchase behaviour (Aaker and Bagozzi, 1982; Van Liere and Dunlap, 1981; Zimmer et al., 1994). Educated individuals are more conscious about the environmental impact of their purchasing decisions, thus more likely to make green purchases. But opposing conclusions have also been observed. Kinnear et (1974) found no significant association and Samdahl and Robertson (1989) found the opposite. suggesting that education was inversely correlated with environmental sentiments.

Income

The influence of income levels on the green attitude of consumers was quite assorted. Because they can pay less attention to price variations between eco-friendly and conventional products, consumers with higherthan-average purchasing power are more attentive to environmental issues than those with average or low income (de Paço et al., 2009). However, studies that provide opposing conclusions do exist. Straughan and Roberts in their replication of Roberts' study, showed that people with lower income were more likely to demonstrate a green attitude. This might be because lower-income people can be more conscious of environmental issues than higherincome people are, and they may also want to support businesses that put sustainability first. Also, those with lower earnings may be more likely to practice ecologically friendly habits that don't need major outlays of money, including conserving electricity, taking the public transit system, or taking part in recycling programs. The impact of demographics on green purchase behaviour is significant yet inconsistent. While consumers have shown a positive attitude towards green spending, they disbelieve the idea that

individual actions can avert environmental destruction. This can be best described by the question, "Why be involved in a losing battle?". Keeping in mind that individual values, ideas, and attitudes can strongly influence consumer behaviour is also very important. Although no firm conclusion has yet been reached because of the unclear results of several studies. the aforementioned can be very research helpful when conducting subsequent studies.



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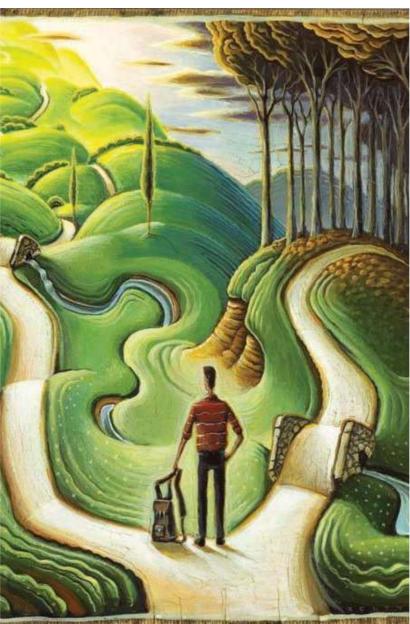
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GREEN INFRASTRUCTURE



AT CROSSROADS

GREENING THE CONCRETE JUNGLE

The Role of Green Infrastructure

by Palak Mehta



"Green buildings are not about the buildings- it is about the people." -Sandy Wiggins

Sustainability linked with green infrastructure is an emerging yet essential concept that needs to be explored. To preserve our resources and boost the economy, countries need to work on urban planning and tourism per se. Looking at a more futuristic view, this field of the economy holds a lot of potentials and supports nature and its lovers.

Green infrastructure refers to natural or semi-natural systems that are designed or modified to provide ecosystem services, such as reducing urban heat island effects, improving air and water quality, mitigating flooding, enhancing biodiversity, and recreational providing opportunities. Examples of green infrastructure include green roofs, urban parks, rain gardens, permeable greenways, and pavements. Green infrastructure is increasingly recognized as an important approach to address the challenges of climate change and urbanization, as it can help to build resilience, reduce vulnerability, and improve the quality of life in urban areas.

Europe has been at the forefront of implementing promoting and green infrastructure, for several reasons such as environmental challenges, urbanization, etc. Europe faces various environmental climate challenges such as change. biodiversity loss, and pollution. Green infrastructure can help to address these challenges by providing natural solutions that contribute to the protection and restoration of ecosystems.

Urbanization can cause а range of environmental problems, but the green infrastructure can help to mitigate these issues by providing green spaces, improving air quality, and reducing the urban heat island effect. Europe has a strong policy framework to support the implementation of green infrastructure, including the EU Biodiversity Strategy for 2030, the EU Green Deal, and the Urban Agenda for the EU. Europe is also known for its innovative approaches to green infrastructure, such as the use of green green walls, roofs and and the development of multi-functional green infrastructure that provides a range of services. ecosystem Overall. green infrastructure is seen as an important strategy for addressing environmental challenges, promoting sustainable development, and improving the quality of life in Europe.

Through techniques like urban forestry, green roofs, and green walls, green infrastructure can help to lessen the consequences of climate change bv reducing greenhouse gas emissions and sequestering carbon. It can create habitats for a variety of species, promoting the preservation of biodiversity and raising the ecological worth of urban and perienvironments. urban By eliminating pollutants from the air and lowering the urban heat island effect, it can enhance air quality. Additionally, it can aid in stormwater management by lowering runoff and enhancing water quality.



In addition to supporting cultural and educational endeavours, it can offer possibilities for recreation and social contact. Through the creation of jobs, increased property values, and cost savings from lower infrastructure maintenance and energy costs, it can support economic growth.

It can be challenging to implement green infrastructure since it frequently involves cooperation between several sectors. stakeholders, and governmental levels. In addition, it may need ongoing maintenance and supervision and come with significant upfront expenses. Because of competing demands for urban expansion, agriculture, and conservation, there may not be enough land available for green infrastructure. There is a chance that the advantages of green infrastructure won't be dispersed fairly, with some communities benefiting more than others. Technical restrictions may apply to certain types of green infrastructure, such as the appropriateness of the soil or the capacity to survive extreme weather conditions. In Europe, the advantages of green infrastructure generally outweigh the possible negatives, but it is crucial to carefully plan and implement green infrastructure projects to ensure that they are efficient, egalitarian, and sustainable.

Exploring the case of the European Union, a global pioneer when it comes to making laws and mandates for green infrastructures, let's dive deep into the case of green infrastructures in India. India has started adopting green infrastructure due to the myriad benefits it offers. Firstly, it can play a pivotal role in mitigating the adverse effects of climate change, such as flooding, air pollution, and extreme weather events. Secondly, it can spur sustainable economic growth, particularly in rural areas, by creating employment opportunities and facilitating small business growth. Thirdly, it can bolster public health by curbing exposure to pollutants and enhancing access to green spaces. Finally, it can make a significant contribution to the achievement of India's sustainable development goals by promoting environmental sustainability, social equity, and economic growth. By embracing green infrastructure, India can address some of its most pressing challenges while fostering sustainable development and securing a more salubrious and prosperous future for its people.

However, the adoption of green infrastructure in India is hampered by several problems, such as a lack of public understanding of the many advantages of green infrastructure, which may discourage implementation. These projects often require a sizable upfront investment, which can be difficult to finance, especially for small firms and rural communities, and thus presents a considerable hurdle.



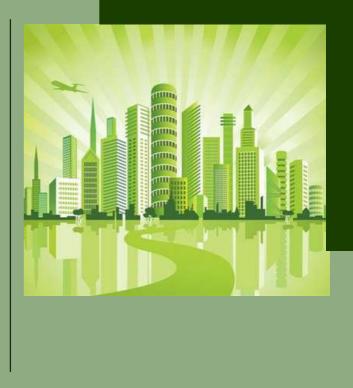
Additionally, regulatory obstacles such as murky rules, insufficient incentives, and lax enforcement of current norms obstruct development in this field. The adoption of infrastructure also green may be constrained by the insufficient supply of infrastructure in some areas, such as transportation, energy, and water. Also, there is a lack of experts in disciplines like architecture, and engineering, urban planning, which limits the technical capability of green infrastructure.

In India, green infrastructure has several effects. positive economic Promoting innovation and job creation, it can boost economic growth. Since this initiative calls for qualified specialists, there may be more job possibilities overall, especially in rural areas with high unemployment rates. The creation of green infrastructure can encourage entrepreneurship and innovation, creating new economic opportunities and stimulating growth. It can lower energy costs and increase building efficiency, which can lead to cost savings for both individuals and enterprises. For instance, the use of green walls and roofs can lower the cost of cooling while green buildings use less energy to heat and cool themselves. In the long run, this can result in significant cost reductions, especially for low-income households. Green infrastructure can increase property prices and draw new investment. Investors frequently infrastructure view green components in a building as more desirable, and these properties can command higher rental and sales prices. This may encourage investment in the region and promote further economic expansion.

In India, green infrastructure has the potential to have a substantial positive impact on the economy through the creation of jobs, cost savings, and higher property prices. India may invest in green infrastructure to advance environmental sustainability, spur economic growth, and enhance the quality of life for its people.

nation has suffered The significant declines in its natural green cover, including its forests, wetlands, and grasslands, which serve as essential regulators of climate, disaster mitigation vital mechanisms, and biodiversity supports. Moreover, the loss of green cover has further resulted in increased air and water pollution, soil erosion, and the of deterioration ecosystem services. These outcomes can have significant economic ramifications, including reduced agricultural productivity, diminished water availability, and escalated healthcare costs due to the prevalence of poor air quality. The loss of green infrastructure can intensify the effects of climate change, leading to an increased frequency and intensity of extreme weather events such as floods, droughts, and heat waves. Such outcomes can result in notable economic losses, particularly for the agricultural sector, which is a key contributor to India's economy.

In conclusion, the development and integration of green infrastructure in Europe and India differ significantly. Europe has a well-established and integrated system of green infrastructure, with a long history of environmental conservation and activism. On the other hand, India faces several challenges due to rapid urbanization and population growth, leading to a lack of green spaces in many urban areas. Despite these differences, both regions recognize the importance of green infrastructure for promoting sustainable development and improving the quality of life for their citizens. Initiatives and programs have been launched in both regions to promote the development of green infrastructure, highlighting the growing awareness and commitment towards building a greener and more sustainable future.



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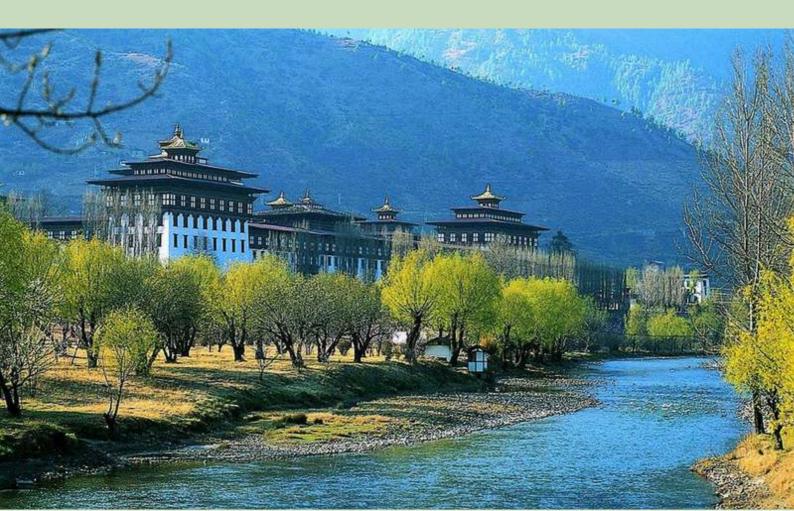
1 **ROADWAYS TO** ECOTOURISM Case Study of Bhutan

by Preeti Kumari

For any country, its tourism policy plays an important role in sustainable development. This is where the concept of Ecotourism comes to light. In simple terms, the emphasis on enjoying the environment and simultaneously taking steps towards its preservation is termed Eco tourism.

State of Affair

Bhutan-one of the smallest countries in the world, with a commitment bigger than most has adopted the conservation policy as an exclusive travel destination based on the Gross National Happiness (GNH) Values. All this starts in the year 1974 when the world population reached 4 billion, Bhutan a landlocked country on the southern slopes of the mighty Himalayas was still hesitant in inviting foreign guests. A country with such vibrant culture and history opened its door to tourists in 1974 with the policy of HIGH VALUE, LOW VOLUME and levying a tariff of \$130 per night per person with the objective of earning revenue and foreign exchange. The tariff was levied for attracting fewer people and more revenue. This policy was later changed to HIGH VALUE, LOW IMPACT. This not only helped Bhutan to raise income from tourism but helped sustain the inflow of tourists and damage to the culture and biodiversity of the country. It is even necessary for Bhutan to sustain its culture and environment because most of the tourists who visit Bhutan are cultural tourists or trekkers. Bhutan, a very conservative country that was modernising with caution, faced several setbacks before it embarked as a tourist destination. They have poor infrastructure, transportation, and no legal currency.





Joining hands

Since 1977, WWF (World Wildlife Fund) has supported conservation initiatives in Bhutan to safeguard the nation's rich biodiversity and distinctive cultural legacy. WWF started by establishing several offices in different districts of the country and recruiting skilled natives. Bhutan has been a crucial location for WWF's work in several important sectors, including policy advocacy, sustainable livelihoods, and conservation. The conservation of Bhutan's snow leopard population is one of WWF's key initiatives there

Most of the tourists who visit Bhutan are either cultural tourists or trekkers who are keen on exploring the flora and fauna exclusively found in the mighty Himalayas. Hence, conserving wildlife is not only necessary for Bhutan to conserve its biodiversity but also to support the sustainable inflow of tourists.

<u>Cooperation with Neighbours</u>

Being a landlocked country with minimal resources to exploit and demographic capability. It is obligatory for Bhutan to have a healthy relationship with neighbouring countries. It becomes even more important when a petite country like Bhutan is between two massive economies. They need to cooperate suitably. Bhutan is also a member of SAARC (South Asian Association for Regional Cooperation). Like any other country, their service sector and industry contribute highly to their economy and these services and finished goods need a market that the South Asian Free Trade Area provides. It provides the opportunity to trade freely and find the market in South Asia itself. India is a substantial trading partner of Bhutan as 95% of goods are exported to India and 80% are imported from the same. Hence a cross border trade brings flavourful returns

Policy factor

The Royal Government of Bhutan started tourism with the policy of "High Volume, Low Impact". Which later changed to the "High Value, Low Impact" policy of Bhutan. This policy of Bhutan has contributed significantly to foreign exchange earnings and government revenues, income, and employment generation, and to regional development to some extent. This policy of Bhutan focuses on attracting the elite group of the world with the money to bring more hands to spend than bodies to explore and contribute significantly to its Gross Domestic Product (GDP). In Bhutan, the Tourism Development Committee was established with the motto

- To act as the apex body to oversee all matters related to tourism development
- To provide advice and guidance to the Department
- To approve the plan formed by the department
- And being a bridge between the Royal Government of Bhutan and the private firms

In 1999 the Department of Tourism set up a Tourism development fund for infrastructural development for tourism in the country and collected a tariff of 10US dollars. The goal of the policy is to protect Bhutan's distinctive identity while ensuring that tourism benefits the local populace. Tourism is like fire. Out of control, it can burn your house down. When properly managed, it can lighten your house. When the tourists started exploring the Shangri-la this influx had the potential to exploit the local culture and environment. But due to the **HIGH VALUE, LOW IMPACT** policy established by the Royal Government of Bhutan to control tourism and curtail the abuse of artistry of god, they were able to control the inflow of tourists and ensure the sustainability of the industry. They levied a copious per night stay charge to attract only the elite who can supply great revenue; also it has contributed significantly to increasing reserves and revenue to the royal government. In consequence, tourism contributed 4.73% of the GDP of Bhutan in 2019. Tourism cooperation was privatised in Bhutan, creating a void for big players to enter and employment opportunities for regionals. But due the department of tourism lacks two weak institutional bases i.e., finance and manpower, but even after all these drawbacks Bhutan's tourism sector is regarded as one of the most exclusive travel destinations in the world with a reputation for authenticity.

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SUSTAINABLE TOURISM AND FUTURISM

Sri Lanka's Perspective

by Harshaa Kawatra

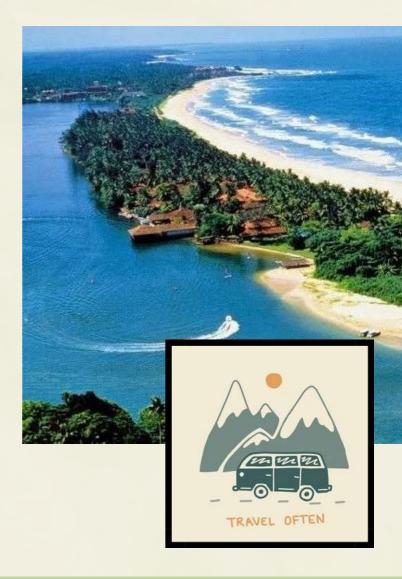
Being an island country in South Asia, Sri Lanka lies in the Indian Ocean, southwest of the Bay of Bengal. It has always faced turbulence when it comes to its economic. political, structural, or social stances. The has been a popular tourist country destination for decades, with its beautiful beaches, ancient temples, and vibrant culture drawing millions of visitors each year. However, it has also faced a number of crises over the years that have had a significant impact on its tourism industry. Focussing on the same, it is important to look at how the country has responded to the aforesaid turbulence.

Talking about crises, most recently, Sri Lankans started experiencing power cuts and shortages of basics such as fuel. According to a report by the United Nations, the rate of inflation hit 54.6% in July 2022. Protests erupted in the capital Colombo in March 2022 and spread across the country. The country ran short of fuel for essential services such as buses, trains and medical vehicles because it did not have enough reserves of foreign currency to import more. The fuel shortage caused petrol and diesel prices to rise dramatically. In June 2021, the government banned the sale of petrol and diesel for non-essential vehicles for two weeks.

Hovering back to tourism, the Easter Sunday bombings in 2019 impacted the tourism industry of the country. On April 21, 2019, a series of coordinated bombings took place at churches and hotels across the country, killing more than 250 people and injuring hundreds more. The attack was carried out by a local extremist group with ties to ISIS, and it had a devastating impact on the country's tourism industry. Many tourists cancelled their trips, and the government imposed a state of emergency, which further damaged the industry. Nevertheless. Sri Lanka has worked hard to recover from the crisis. The government implemented a number of security measures to prevent further attacks, and the country's tourism industry launched a marketing campaign to reassure potential visitors that it was safe to travel to Sri Lanka. As a result, the industry has slowly started to recover, with visitor numbers increasing over the past few years to experience the country's beautiful beaches, rich culture, and natural beauty.

All these crises have challenged Sri Lanka's resilience, and have had a direct as well as indirect impact on the country's an economic situation. The relationship between foreign direct investment (FDI) and economic growth in Sri Lanka over the period 1975-2015 existed, where FDI has shown a positive impact on economic growth in the short term, but the effect diminishes over time. However, Sri Lanka's trade and investment policies since independence have been inconsistent over time. The relationship between the investment climate, FDI, and economic growth in Sri Lanka has been topsy-turvy. On the positive and brighter side, a better investment climate, including а more favourable regulatory environment and infrastructure development is expected to attract more FDI and contribute to economic growth.

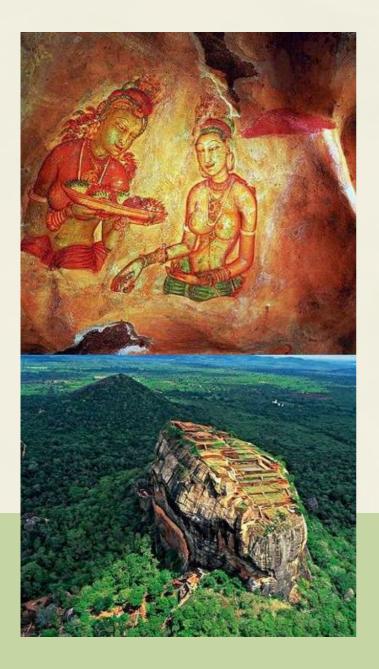
The need to strengthen the country's economy lies within its tourism industry as it contributes to a majority of the country's economy. Thus the country has proposed certain policies that aim to balance the economic benefits of tourism with the need to protect the country's natural and cultural heritage. One of the key initiatives has been the establishment of the "Sustainable Tourism Development Plan" in 2017. This plan outlines a range of strategies and actions for promoting sustainable tourism in Sri Lanka, including the development of eco-tourism and community-based tourism, the conservation of natural and cultural heritage sites, and the promotion of responsible tourism practices. The Sri Lankan government has also introduced a number of regulations and guidelines to activities ensure that tourism are sustainable.





For example, there are restrictions on the number of visitors allowed in certain sensitive areas, such as national parks and wildlife reserves. The government has also implemented a system of permits for tourism operators, which helps to monitor and regulate their activities. In addition, there are various programs in place to support local communities and promote their involvement in sustainable tourism. These include training programs for local guides and tour operators, as well as initiatives to promote the development of small and medium-sized tourism enterprises.

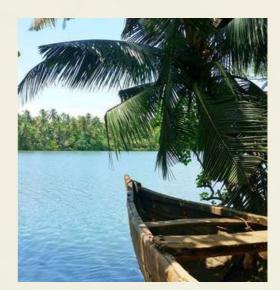
Moreover, the country has also been focused on developing its renewable energy sector, with a goal of generating 70% of its electricity from renewable sources by 2030.



Sri Lanka has significant potential for renewable energy, including solar, wind, and hydropower, and has been investing in the development of these resources. Overall, Sri Lanka's sustainable plans and initiatives demonstrate a commitment to promoting sustainable tourism and economic growth in the country, while also protecting the natural and cultural heritage of the island nation.

It has now identified the need to transition towards a low-carbon economy and to promote sustainable economic growth, while also protecting the environment and preserving natural resources for future generations. 52% of Sri Lanka's electricity in 2015 was produced from fossil fuels. Due to a lack of domestic fossil fuel supplies, a large portion of Sri Lanka's import expenses goes towards importing the fossil fuel used to generate power. The need for power in Sri Lanka will rise in the future as a nation. Recognising developing this requirement. Sri Lanka increased the proportion of renewable energy (RE) in its electrical mix in 2014 after achieving its goal of producing at least 10% of its electricity from renewable sources. The contribution of fossil fuels to the mix of energy sources then declined in 2015, while the contributions of large hydro and renewable energy both increased.

The country's strategic plan for tourism emphasises the need to promote sustainable tourism practices, such as ecotourism, cultural tourism, and adventure tourism. These practices not only help to preserve Sri Lanka's natural and cultural



heritage but also promote economic development in rural areas and support local communities. In line with the 2030 Agenda, Sri Lanka aspires to achieve an "Inclusive Transformation towards а Sustainably Developed Nation for All" where social inclusion and green growth serve as the foundation for economic change. The inclusion of the 2030 Agenda and SDGs in programs like the Public Investment Programme 2021–2024 and the National Policy Framework - Vistas of Prosperity and Splendour is crucial to this transition.

Policies that turn Sri Lanka into a Blue-Green Economy are being implemented in order to fuel economic diversification. These include shifting to renewable energy. agriculture developing based on biodiversity and sustainability, waste management, and utilising underutilised marine resources in a sustainable and regenerative way. The top objective for all parties involved is to consolidate Sri Lanka's current progress towards the 2030 Agenda and the SDGs, ensure that it is not reversed, and enhance ownership and implementation mechanisms.

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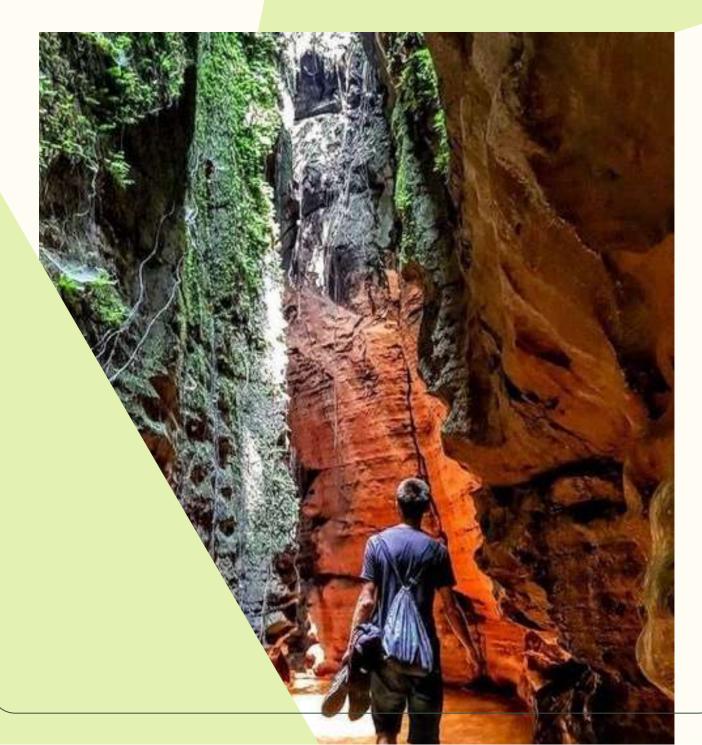
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TRAVERSING SDGS Case Study of Nigeria

By Aadhya Singh



activities in the disguise of Human development have reached a level that is altering the planet's climate and biological mix. The loss of biodiversity is now reaching an alarming rate, a rate that if not looked upon will cause the destruction of mankind, who ironically are planning to be immortal with the new development. The concept of sustainable development has a broad appeal and little specificity, but some combination of development and environment as well as equity is found in many attempts to describe it.

Meanwhile, when development was taking place in both, developing, and developed countries, The United Nations introduced the first step toward safeguarding the environment i.e., Millennium Development Goals (MDGs) which were signed in September 2000. These were 8 goals that the UN Member States have agreed to try to achieve by the year 2015, which safeguards the interests of all the countries and commits world leaders to form an alliance to combat topics that were mainly social evils like Poverty, health, and discrimination.

The World Health Organization (WHO) had put its best foot forward to help to achieve these goals because several of these were directly related to health issues, by collecting and disseminating data on health so that countries can plan health spending and track progress and by also assisting national authorities to develop health policies and plans and helps governments work with development partners to align external aid with domestic priorities. As the MDGs reached their deadline, significant development could be seen in the present scenario as compared to the time when they were introduced. The MDGs later evolved into SDGs. The difference between the two is, the former targets developing countries and the latter applies to all countries with any type of economy.

Even after the introduction of the SDGs and the widespread adoption of and progress toward Sustainable Development Goals, Africa continues to lag behind most of the world when it comes to socioeconomic development. But on 7 June 2021, the Nigerian government introduced the Sustainable Development Goals Implementation Plan, with support from the United Nations Development Programme (UNDP). The launch took place in Abuja, the federal capital territory of Nigeria. With the historic adoption of the 2030 Agenda for Sustainable Development Goals by Nigeria, has continued the government to demonstrate commitment to the overall implementation of the SDGs, including the establishment of institutional frameworks to and policies ensure effective implementation and smooth functioning of the Global Goals.

The publication of Nigeria's Integrated Sustainable Development Goals (SDG) Model Report 2019, represents a historic moment in the development path of the country. The report serves two important purposes. First, it indicates the official announcement of the successful domestic implementation of the integrated Sustainable Development Goals (SDGs) model specifically for Nigeria. Second, the implementation is the first step towards the application of the model for policy formulation and planning in Nigeria.

In the past, the country was not able to sustainably develop because of poor funding, and environmental management. This time the United Nations had separate finance allocations for every goal.

Nigeria is taking the lead on the continent and showcasing itself as the best example showing best practices in by early subjugation and implementation of them through coordinating with several agencies, advocacy establishing partnerships, and implementation the The of SDGs. ministries. partnership amongst and departments to domesticate the SDGs for the vulnerable population groups in Nigeria. То measure the progress and implementation of the policies, a new framework had been introduced. The Integrated sustainable development goal model generates policies according to the country-based scenarios to show countrywise progress in achieving the SDGs, UNDP has shown full support to the Nigerian government to apply this model to strengthen_the planning and prioritizing the development, and for further planning that helps in boosting the goals listed above and the investments are thus delegated according to the various goals listed above to achieve all the environmental targets.

Previous data and studies suggest that the more spending on economic, social, and infrastructure. the green more the reduction in poverty. When the MDGs were introduced, the slums were the first ones to get Targeted. The slums were infrastructure deprived, the Nigerian architects and other professionals build are trying to environmentally sustainable slum designs for the same. Dr. Olumuyiwa Bayode Adegun, a member of the Association of Commonwealth Universities (ACU),

quoting the term "green infrastructure" said environmentally sustainable that urbanization achievement still does not seem to be introduced in developing countries. particularly in low-income countries, so the promotion of this idea in Nigeria. The Organisation for Economic Cooperation and Development (OECD) estimated that USD 6.9 trillion per year is needed for the implementation and domestication of green infrastructure investment in infrastructure to meet development goals and to develop a lowcarbon, climate-resilient future. According to the Global Infrastructure Hub, the introduction and launch of the SIP i.e Sustainable Infrastructure Participation act as a platform to support approaches to sustainable infrastructure planning and development. It recognizes the centrality of infrastructure.



It conducts work by considering different infrastructural systems and phases of governance. This approach helps in delivering the optimal solution to infrastructure development.

Both the Nigerian government and the United Nations are in the initial stages of concluding the development that is or will be taking place in Nigeria and the progress it will make in the future, but there are a lot of positive changes that have taken place. The few milestones that have been achieved are the strengthened partnerships with diverse stakeholders for the joint SDG fund. Investment in data systems for better monitoring implementation and measuring progress and policy interventions with a focus on supporting solutions while the easy determination of the additional cost of scaling up public investments in social and physical infrastructure to achieve the SDGs.

To achieve the goal of clean Water and Sanitation declaration of a state of emergency in the WASH Sector by the UN and its partners led to the subsequent launch of a National WASH Action Plan, including a promise that Nigeria will end open defecation by 2025.



The future of the country lies in its development and how it promotes its goals with all enthusiasm. The building of infrastructures and other development activities should be done in a way that does not make any one fraction of the society suffer. So, each of the 17 goals and their implementation must be kept in mind before any further development plans.

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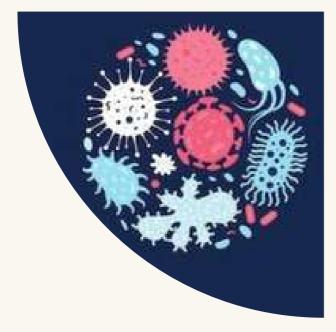
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WITH HEALTHCARE

DIGITAL INDIA: TECHNOLOGY IN HEALTH SECTOR

By Dishika Gupta

After the outbreak of the pandemic, people have moved towards the adoption of technologies and telemedicine to monitor their health. Through telecommunication and telemedicine, these services connect various parts of rural India to the best doctors facilities available in and cities. Technological innovations only revolutionized have not the healthcare sector but also transformed the outlook of healthcare over the past few years. Technology is key driver of economic growth. considered a Advancements in healthcare due to technology such as AI tools, medical devices, and the cloud have changed the traditional way of medical practices and helped to deliver better treatment. Therefore governments have a huge role in instigating digital transformation of the health sector through digital programs.

AYUSHMAN DIGITAL BHARAT SCHEME or ABDM is one of the initiatives taken by the government of India to strengthen the digital health infrastructure of the country and to revolutionize the healthcare sector of India. A number of digital platforms such as e-Sanjeevni, "One of the most interesting things about science fiction and fantasy is the way that the genres can offer different perspectives on matters to do with the body, the mind, medical technology, and the way we live our lives."

Tansy Rayner Roberts

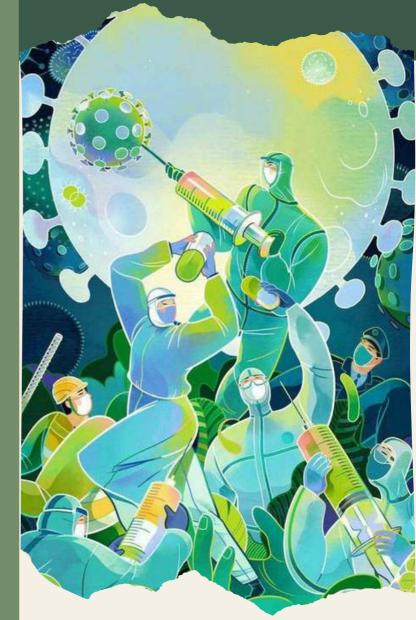


Aarogya Setu, co-win, e-hospital and many more have been deployed under ABDM. Additionally, this flagship program has proved to provide access to a large number of people all over India as a significant portion of the population remains underserved in terms of access to healthcare. The COWIN platform is considered the world's biggest digitally verified platform for vaccination. The Ministry of Health and Family Welfare is also planning to use this platform for the universal immunization program. It is capable of completely changing and renovating the healthcare sector of India over the next few years.

The government also initiated a Tele mental health program under ABDM wherein 24x7 free mental health services are provided to people. It also announced a national Tele mental health program in the budget 2022-23 keeping in mind mental health issues escalated during the pandemic. An estimated 7% of the Indian population deals with mental health issues with at least one in four families likely having one member with a mental disorder, according to the World Health Organization.

The National Health Stack (NHS) was established to ensure the implementation of digital health services at all levels. The 'Make in India' initiative also helped lower the costs of medical devices once imported.

Besides health benefits, all these online healthcare platforms have done wonders for our economic situation. India's healthcare sector is among the country's biggest in terms of revenue and employment.



India is the fourth-largest medical devices market in Asia after Japan, China, and South Korea. The IBEF report states that the Indian medical devices market is estimated at \$11 billion and is expected to grow to \$50 billion by 2025. Moreover, according to a report from the Indian Electronics and Information Technology Ministry, India can create over \$1 trillion of economic value from the digital 2025 The Healthcare economy in Information Technology (IT) market is valued at US\$ 1 billion currently (April 2016) and is expected to grow 1.5 times by 2020. Healthcare spending continues to rise.

Global digital health summit released Digital Health for All by 2080 which included a panel of senior policymakers from the government



of India and concluded with a panel discussion on 'Making India a World Leader in Digital Health Implementation'.

Their marginal costs i.e cost of production in producing an additional unit are none because they are provided free of cost and the cost of updating the app is also zero. They are proven to provide the same level of output using fewer inputs and investments. It has not only led to an increase in highly skilled labour because an efficient health workforce is required but has also impacted economic growth by creating many employment opportunities and revenue generation.

Governments of other countries have also moved forward toward a successful digital healthcare system. Ambitious digital plans were launched by NHS England to ensure health using technology and easy accessibility of health information. South Korea is also one of the successful countries to digitalise their healthcare institutions through ICT interventions.

From standing in a queue to get a small test or a checkup done to have it done in seconds online, a lot has changed after the pre-COVID era. Conventional health methods failed to provide the essential services needed in a sector like healthcare and thus digital health has been a saviour.

However, digital health in India faces many challenges. Cyber attacks, security and privacy remain key concerns in storing health information and therefore data interoperability is an ongoing challenge. In Indian healthcare, awareness, accessibility, availability, affordability, and accountability remain significant concerns.

Therefore, a major focus should be on enlightening the people about such services(digital literacy) and educating them about the risk of health problems so that even the marginalised communities are exposed to better treatment and living conditions. Income disparities too play a major role in worsening health problems depriving the unprivileged of basic health amenities and thus a significant proportion of the population remains untreated. Digital health can be a solution only if it reaches a wider set of people and thus Government plays an important role in delivering these services to ensure welfare to all.

Despite the success stories of digital India, the list of policies implemented face various shortcomings and gaps in terms of legal and ethical constituents. It is necessary to take into account research findings from other fields such as behavioural medicine, computer engineering, and information

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systems research to better understand the success of DHI's.

Investments in India's healthcare sector are expected to rise substantially after a considerable amount of investment in R&D to train the digital talent of the country. One of the most striking examples of digital transformation is of Kerala. Its healthcare system was digitalised 10 years ago and was supported by the world bank. Its health management information system has been functional in 264 secondary care hospitals and 50 tertiary care hospitals in the state. Tamil Nadu was among the first states in India to launch a digital health program.

India's healthcare system failed when up to

49 lakhs of it's population were swept away in 2nd wave of the pandemic and exposed potholes in the healthcare sector. The digital health system has a variety of concerns and the major being privacy and security. India's lack of financial resources and other challenges including rural coverage are possible disadvantages of digital health in India. There is high uncertainty regarding the digitalisation of healthcare in India due to its limitations with respect to coverage and clarity. Digital Personal Data Protection (DPDP) Bill was criticised. Although telemedicine was present in India before the pandemic, its use was limited. Government-financed schemes have proved to be inequitable inefficient. They and must address universal coverage.



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Startups in Healthcare for a Healthy Tomorrow

By Khushi Aggarwal

Technology can be a great equalizer when it comes to healthcare, to the point where poor, middle and rich class can all get the same benefits.

- Jeff Greene





Covid in India saw a growth of nearly 40% rise in startups which actually is a good ratio for a developing country like India. During the hard times when everyone was losing their jobs and the economy hit rock bottom, startups, online startups to be exact came into the game.

Let's start from the very scratch by asking a question what exactly is a startup? Startup is a newly established business owned by any individual to tackle market demand by creating new and innovative products or services.

The best thing about these startups is that they provide employment opportunities at a basic scale and moreover these startups the have freedom to experiment with ideas and bring into the market different concepts and models. The other main motive is to provide facilities to the deprived section of society.

startups in healthcare have Many since Covid 19. emerged both government and private. This benefited a large section of society, especially in rural areas. Another important feature of E-Healthcare is its affordability. Technology has already begun to develop its roots in the healthcare sector. Apps such as Ayushman have turned out to be a great success during this admit chaos.

Such apps provide privacy and personal space for users. Furthermore, these startups have been instrumental in advancing the technological front.

They bring forward innovative ideas that challenge traditional methods and pave the way for efficient and sustainable practices. Healthcare startups are developing cutting-edge technologies that can diagnose and treat diseases in a more efficient and cost-effective manner.

Economically, e-healthcare has turned out to be India's largest sector in terms of revenue and employment. In the Union Budget 2022-23, USD 11.28 billion was allocated to the Ministry of Health and Family Welfare as per the data. According to data, the e-health market size is estimated to reach US\$10.6 billion by 2025.

India's health-tech sector is on an adventurous journey and is going to grow immensely in the future.

Technology in healthcare has been proven to be the need of the hour. Technology has relieved the healthcare sector of India with expenses, quality concerns with medicines and infrastructure costs. Making their mark in digitalising the healthcare sector in India, the following are the emerging start-ups in the market.





Netmeds

Netmeds was founded in 2010. It is an online platform that provides delivery services for medicines and other healthcare products.

It even provides lab tests through its online portal. This was a great success during the pandemic. It has around 3 million downloads making it the largest startup in pharmaceuticals.

Janitri

Janitri was founded in 2015 looking in the field of maternal and child healthcare. It's device contains an electrode patch with sensors that can read and record the foetal heart rate, the uterine contractions of the mother, foetal movements, and the maternal pulse rate.

This has reduced pregnancy-related complications by up to 80%.





Pharmallama

Pharmallama was founded in June 2020 and offers personalized sorting of drug prescriptions in pouches arranged according to date and time. The notion behind it is to help old aged people with their handy dose of drugs. This will bring a revolution in the pharmaceutical sector.



Various other healthcare startups are emerging and raising high funding. Identification and eradication of many health-related issues is important for a healthy India.

In conclusion, emerging startups have brought with them a new wave of innovation and have changed the way we perceive and operate in various sectors. They have the power to create a better future for everyone by creating new job opportunities, advancing technology, and providing solutions to the most challenging problems we face today. Therefore, it is crucial to support and encourage the development of startups to create a better and sustainable future for all.

And at last, as it is said, 'Health is the most important asset we have'. And technology is making its access easier.

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SCIENCE FULL OF HEALTHY SURPRISES

By Asmita Pandey

"Once a new technology rolls over you, if you're not part of the steamroller, you're part of the road."

~ Stewart Brand

Are miracles enough to save someone's life or treat someone's illness?

Miracles do happen, however, with science, we have an assurance that we're going in the right direction especially when it comes to healthcare- innovation and technology in this field become the miracle needed when people lack resources and awareness about a complicated disease or surgery.

Science has come far along now using innovation as a means to create technological advancements which not only reduce healthcare costs but also help in equal distribution of access to healthcare. It builds healthy humankind.

High-Quality Patient Care

Whether it is giving anesthesia, drawing blood, checking body temperatures frequently or simply monitoring vital signs; all these activities require nurses to be available at all times. On top of that, simultaneously updating a register with all the details. Medical Robots are messiahs in this case who assist nurses and doctors in doing the above, moving patients and other things.

Recently, a device was invented which could detect stress levels and sleep patterns. It was made to check the above specifics and diagnose and rule out any early onsets of rare/undiagnosed diseases.



RElectronic Health Records have completely replaced registers and paper records used to store a patient's medical history and print test reports. Technology has made not only the lives of doctors but also patients easier. It has made possible the treatment of even the rarest of rare diseases.

Modular Robots

Robots being developed for healthcare can be a turning point due to the high accuracy level they can achieve during surgeries and other related procedures.

A wheelchair-mounted robotic arm currently being developed by Intel and Accenture aims to assist patients with spinal injuries, paralysis etc. in performing daily tasks.

It is going to be completely automated and plans to inculcate an increased sense of independence among users. The only downside is the exorbitant costs that are required for the production. Constant efforts are being culminated to make the production design more cost-friendly.

Tech has given a sharp boost to the GDP contributing to India becoming the \$5 Trillion Economy by 2030. Indian Healthcare's constant innovation has made it one of the most renowned in the world. It is the equitability of it that makes it accessible and attractive for people from all over the world.

It has also stimulated young minds to innovate more. A perfect example of that was seen on Shark Tank India where a girl pitched a product that could check a person's blood sugar levels without pricking his/her skin!

During 2021-22, India exported pharma products worth US\$ 24.62 billion. Pharmaceuticals hold a major chunk of India's exports. Also, many medical devices become attractive for U.S. Firms in the export sector for quality technology at reasonable prices.

In hindsight, the need for labor has decreased which directly affects employment within the sector. Tech has made people accustomed to the idea of smooth performance with a click of a button, dictation of a command or mere facial recognition.

While we need less manhandling of patients, health records, and devices; we need more individuals for operating and handling these new and upcoming technologies, ones who adapt to new innovations and use them efficiently. The job market is declining in one arena however, it is opening up new positions in the high-skilled tech sector.

We definitely need tech as it proves to be monumental for improvement in healthcare. More junior doctors could be trained with the latest technology during their residencies and fellowships. Since new jobs related to technology, innovation etc are on the rise, people need to be made comfortable with this new era.

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GUEST SECTION

THE MILLET REVOLUTION IN INDIA: THE KEY TO REVITALIZING INDIA'S AGRI-ECONOMY

-Apurwa Gupta

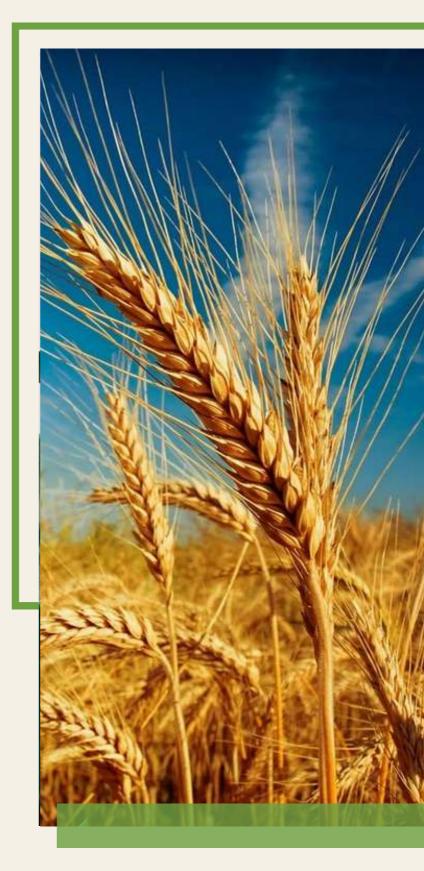
"Amidst the challenges facing India's agriculture economy, rediscovering the forgotten superfood could hold the key to a thriving agri-economy and ensuring a sustainable future."

Agriculture and Food Tech: Key Drivers of India's Economic Growth

Agriculture, as an economic activity, involves the production, processing, and distribution of food, fiber, and other products derived from crops and livestock. In developing nations like India, where a sizable portion of the population depends on agriculture for a living, this essential sector is especially important to the overall economy of the country.

The production of seeds, irrigation, fertilization, harvesting, storage, transportation, processing, and marketing are just a few of the numerous activities that make up the agri-economy. A significant portion of the workforce, especially in rural areas, can find work in this multifaceted industry, which also serves as a significant source of income and foreign exchange earnings for the nation.

The growth of the agri-economy directly affects the growth of the overall economy.



Employment, higher incomes, and a decrease in poverty are all benefits of a thriving agricultural economy. It can also contribute to the development of rural infrastructure, such as roads, electricity, and water supply, which can improve the quality of life for rural communities. By ensuring that food is available at reasonable prices, a strong agri-economy can support food security. This is a serious issue in a nation like India where a significant portion of the populace still suffers from malnutrition. Additionally, the development of related industries like food processing, packaging, and transportation may be influenced by the expansion of the agrieconomy. These sectors of the economy have the potential to create more jobs and advance the national economy.

Food technology is a discipline related to the sector that deals with agricultural the processing, preservation, packaging, and distribution of food products using scientific and technological principles. This field also plays a crucial role in the economy of a country, particularly in the context of food security, export earnings, and job creation. By leveraging the latest innovations in food technology, countries can improve the quality and safety of their food products, increase their shelf life and transportability, and meet the diverse and evolving needs of their consumers. Moreover, food technology can also help reduce post-harvest losses, minimise food waste, and enhance the efficiency of the entire food value chain, from farm to fork. In this way, food technology can contribute to a country's economy's overall growth and competitiveness by unlocking the potential of its agricultural and food sectors and creating new opportunities for entrepreneurship, innovation, and trade.



Navigating Challenges

India is predominantly an agrarian country, with over 50% of the population engaged in agriculture and allied activities (Agricultural and Farmers' Welfare, Government of India). The agriculture sector contributes around 16% to the country's GDP and plays a crucial role in ensuring food security and reducing poverty (Agricultural Statistics at a Glance 2021, Ministry of Agriculture and Farmers' Welfare, Government of India). However, the sector is facing several challenges that need to be addressed to ensure its sustainable growth. Some of these challenges are low productivity, lack of diversification in crops, lack of credit and finance to small-scale farmers, climate change and lack of ensuring remunerative prices for farmers.

One of the main challenges facing Indian agriculture is low productivity. Despite being the world's second-largest agricultural producer, India's yield per hectare is much lower than many other countries (Food and Agriculture Organization of the United Nations (FAO), 2019). This is due to several factors, including inadequate irrigation facilities, inadequate use of fertilisers and pesticides, lack of access to quality seeds, and poor soil health.

Another challenge is the lack of diversification in crops. India's agriculture is dominated by a few major crops like rice, wheat, and sugarcane (Agricultural Statistics at a Glance 2021, Ministry of Agriculture and Farmers' Welfare, Government of India). This makes the sector vulnerable to price fluctuations and market volatility, as well as being susceptible to pest and disease outbreaks that can devastate entire crops.

Climate change is also a major challenge aced by Indian agriculture. Erratic rainfall rising temperatures, patterns. and extreme weather events such as floods and droughts are becoming increasingly common, and are impacting crop yields and productivity. Developing climateresilient crops and agricultural practices, such as the adoption of drip irrigation and other water-efficient technologies, is therefore essential. India's agriculture sector faces several challenges that need to be addressed to ensure its sustainable growth. Maybe, the solution to most of these challenges may lie in our roots.

Reviving Millets: India's Opportunity for a Sustainable Agri-economy

Millets, including varieties such as sorghum, pearl millet, and finger millet, have been grown in India for centuries. They are highly adaptable to a range of climatic conditions and are an important source of food and income for millions of small-scale farmers across the country. However, in recent decades, the popularity of millets has declined as other crops like wheat and rice have gained prominence.

The United Nations has declared 2023 as the International Year of Millets, to raise awareness about the health benefits and nutritional value of these crops. India, as the world's largest producer of millets (Food and Agriculture Organization of the United Nations (FAO)), has a unique opportunity to leverage this event to promote the crop and boost its agrieconomy. By promoting the health benefits of millets, and highlighting the environmental and economic advantages of their cultivation, India can rekindle interest in these crops, and create new markets for them.

Why Millets?

One key advantage of millets is their low water requirement. In a country like India, where water scarcity is a major challenge, millets offer a sustainable alternative to crops that require significant irrigation. Additionally, millets are resistant to pests diseases and and do not require expensive inputs like fertilizers and Traditional pesticides. methods for growing millets include mixed cropping and crop rotation, which can help maintain soil fertility and lessen the need for synthetic inputs. This makes them an attractive crop for small-scale farmers who may not have the resources to invest in conventional farming techniques.



Furthermore, millets are highly nutritious and are rich in essential minerals like iron, calcium, and magnesium. They are also a good source of dietary fiber, which can help prevent lifestyle diseases like diabetes and obesity. By promoting the health benefits of millet, India can tap into the growing demand for healthy and sustainable foods, and create new export opportunities for the crop.

The International Year of Millets also offers an opportunity to create value-added products from millets, such as flour, breakfast cereals, and snacks. These products have a growing market both in India and abroad, and can provide an additional source of income for millet farmers.

Small and marginal farmers, who are frequently the most susceptible to economic disruptions, may be able to supplement their income by growing millet. India can contribute to lowering rural poverty and encouraging inclusive economic growth by encouraging millet cultivation.

Millets, Food Tech, and Agri-economy: Synergizing for Sustainability

Food technology, particularly in the context of millet, can have a significant impact on the agri economy and overall economy of a country. As we celebrate the International Year of Millets in 2023, it is crucial to recognize the potential of food technology to promote the cultivation, processing, and marketing of millets, and to harness their numerous benefits for the economy and society. By leveraging the latest innovations in food technology, countries can improve the yield and quality of millet, increase their market value and demand, and create new jobs and business opportunities in the millet value chain. Additionally, food technology can help overcome the challenges faced by traditional millet processing and storage methods, such as manual threshing and inadequate storage facilities, and ensure that millets reach consumers in a safe, nutritious, and attractive form. Ultimately, the synergy between food technology, millet cultivation, and the agri-economy can help build a more sustainable, resilient, and equitable food system, and contribute to the economic and social development of the country.

By highlighting the health and environmental benefits of millet, and creating value-added products, India can position itself as a leader in sustainable agriculture and nutrition, and contribute to global efforts to combat climate change and promote healthy diets.

The rediscovery of millets has the potential to revolutionize the Indian agri economy, by providing a sustainable, resilient, and nutritious source of food for the growing population, while also addressing the pressing environmental and economic challenges faced by the sector.

As we celebrate the International Year of Millets in 2023, it is time for policymakers, farmers, and consumers to come together and embrace this ancient yet innovative crop, and pave the way for a brighter and more prosperous future for India's agriculture sector.

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KaCES Academic Session 2022-23

KaCES _____ Academic Session 2022-23



1. MBA: India or Abroad

The Economics Society of Kalindi College organized a seminar on "MBA: India or Abroad" on 15th November 2022. The seminar was intended for students who wish to know more about pursuing MBA post their graduation. The distinguished speaker, Mr Grijesh Gupta, a career counsellor and centre head at T.I.M.E. was presented with a plant to welcome him.

T.I.ME. offers a wide range of programmes at several locations to prepare students for national and statelevel entrance exams such as CAT, MAT, and JEE. They also offer preparation for international exams such as GMAT, IELTS, and TOEFL.

The session started with a discussion on the perks of an MBA degree. Mr Gupta discussed the admission criteria, the process of the CAT examination (an essential requirement to secure a seat in a prestigious MBA program), and packages received by freshers from IIMs. Mr Gupta quizzed the students to demonstrate that the basic concepts one learns in high school laid down the foundation of an MBA exam, India or abroad. He highlighted the universities abroad with affordable tuition and exposure to pursue a Global MBA.

Towards the end of the session, Mr Gupta answered several intriguing questions from the audience in a Q&A round. The speaker addressed all concerns of the students regarding choosing a course post their graduation. The overall response by the attendees was very encouraging; several suggested conducting similar events in the future. The session ended with a vote of thanks for the chief guest, Ms Neha Chauhan, Dr Seema Yadav and Mr Grijesh Gupta.

2 .Debate competition

On 3rd February 2023, KaCES organised an intracollege debate competition. A total of 24 participants competed in two rounds in teams of three. The topics of debate covered a variety of issues, including peer pressure, animal testing and workplace motivation. Ms Subhadra V, from the Department of Commerce, and Ms Madhuri Singh, from the Department of Economics, were the judges of the competition. In the end, two winners were announced, following which Bindu Raghav, President of KaCES, delivered a vote of thanks. The organisers were praised for their efforts in planning the competition





3. Quiz Competition

On 3rd February 2023, KaCES organised an intracollege quiz competition. It was organised alongside the quiz competition in their inaugural event by the newly appointed council. Ten teams of two competed in two rounds. The rules of the quiz were explained in the beginning. Each team had to answer a question related to economics within 30 seconds to move on to the next of a total of five questions. Four of the highest-scoring teams were selected for the final rapid-fire round. The students showcased their skills sailing through the tricky questions by with confidence. At the end of the exciting and informative competition, Team 10 emerged as the winning team.

4. Lecture on Platform Economics

On 28th March 2023, KaCES organised a lecture on 'Platform Economics'.

The speaker was Dr Vishruti Gupta, an expert economist, specialising in industrial organisation. Dr Gupta holds an Honors degree in economics from the University of Delhi and a Master's degree and a PhD in economics from the Delhi School of Economics. Her research interests include auctions, experiments, and applications of game theory; her doctoral thesis focused on problems in industrial organisation.



Dr Vishruti Gupta began the lecture with an introduction to the origins of trade fairs and how their form has evolved in modern times. This is the subject matter of platform economics. She gave illustrative examples of how companies like Amazon Prime, Netflix, Hotstar etc make profits in the same field through their uniqueness. The students interacted with the speaker during the Q&A session. The session was attended by 40 students. The event was closed with a vote of thanks.



5. Model IMF

On 29th March 2023, KaCES organised Arthasaar'23. One of the events, Model IMF, was the first of its kind in the history of the University of Delhi. The event received a total of 45 registrations. Applications were received from students from various colleges such as Dr Bhim Rao Ambedkar College (DU), Maharaja Agrasen Institute of Technology, GGSIPU, Ramjas College (DU), Yeshwantrao Chavan College of Engineering and Rashtrasant Tukadoji Maharaj Nagpur University.

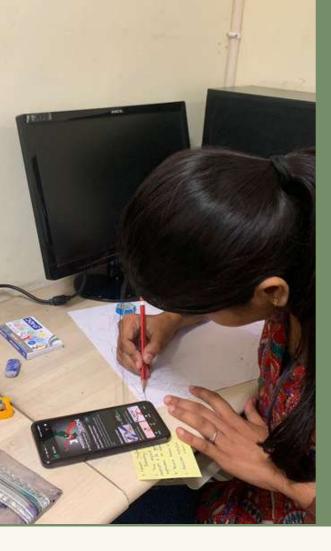
First of the two rounds invited views of the delegates on global events. Shortlisted delegates were assigned countries and invited to participate in the Model IMF held at the college premises. The session began with GSL on the topic, "Trade Affairs: Geopolitics and Destabilizing Economies". Each country was given 90 seconds to speak about its national interest and foreign policy, following which a motion for an unmoderated caucus for 15 minutes was passed. Each delegate was given 60 seconds to speak. On completion of the round, the session resumed after a break of 40 minutes for policy recommendations. Two moderated caucuses were conducted on global recovery, the effects of war and the shortcomings of the IMF. The 5-hour long session ended with questions from the international press and a press release. The winners were awarded cash prizes and gift hampers.

6. Bidding Battle

On 29th March 2023, KaCES organised Bidding Battle as a part of their annual fest Arthasaar'23. The competition received 174 registrations. An online quiz competition was conducted on 27th March 2023 as the first round. Twelve teams were shortlisted for the subsequent rounds. Round 2 facilitated participants to earn money to be used to bid in Round 3. In the 3rd round, several exciting games were played - cookie face, noodle doodle and family feud. It was a neck-toneck battle between the teams, bidding to earn the greatest number of lockers. The winning teams were given cash prizes and exciting gift hampers. Aditya Gard and Himani Garg took the first position, followed by Shreya Yadav and Anusha Yadav in the second place.







7. Comic-Kala

On 29th March 2023, KaCES organised Comic-Kala as a part of Arthasaar'23. The competition received 27 registrations. The competition was conducted in two rounds. In the first round, participants played Pictionary in which they had to identify economics concepts depicted in 15 pictures. The first round was conducted online. In the second round, the shortlisted participants were given four topics on the spot, from which they had to choose one to create a comic strip within 1.5 hours. The topics related to current affairs, technological developments and social media. Ten participants qualified for the final round. The students later presented their exciting comics to the judges.

Varun Nath secured the first position, followed by Krishna Sharma in the second position and Devanshu Sharma in the third position. Winners were given cash prizes and gift hampers.

8. Scavenger Hunt

On 29th March 2023, KaCES organised Scavenger Hunt as a part of its annual fest Arthasaar'23. The competition received 104 registrations from colleges such as Dr Br Ambedkar College, Zakhir Hussain College, Maharaja Agrasen College, Dyal Singh College, SRCC, Satyawati College, Shaheed Bhagat Singh College, Shivaji College, and Sri Guru Nanak Khalsa College.

In the first round, an online quiz was conducted. In the second round, 30 participants in teams of 10 visited the college to compete in a game of Finders Keepers. The teams were presented with chits containing incomplete sentences, which had to be completed by the participants. The third round consisted of a scavenger hunt. The participants were given clues to find a place and bring a selfie. Participants with the correct solution were given the next clue; otherwise, they continued to hunt. The team that solved the seven clues fastest won the maximum points.





9. Sustaination

On 29th March 2023, KaCES organised its flagship competition Sustaination under its annual fest Arthasaar'23. The policy-making competition was held in two rounds: an online quiz and an offline round. The competition received the participation of 96 students across 33 teams. The online quiz related to sustainability was conducted on 27th March 2023 to screen and shortlist participants. Fifteen participants across six teams were shortlisted. The teams were constituted of students from Shaheed Sukhdev College of Business, Asian School of Business, Amity University, Kalindi College, Janki Devi Memorial, and Shri Ram College of Commerce (SRCC).

The offline round began at 1 pm on 29th March on the college premises. The participants were given a welcome note and the general rules of the competition. First, the participants had to select an economic set-up through a random numbering system. Next, they had to identify problems and key features of the setup within five minutes.

In the next round, bidding on technology and skill sets began. At the completion of bidding, participants were given an hour to formulate policies addressing the 17 SDGs. The participants were provided with instructions on utilizing technology and judgement criteria. This was followed by a discussion wherein other participants were given five minutes to ask questions about the policy being presented. Judges awarded points based on the uniqueness of the solution and the discussion round.

Team Rationale prevailed in the first position, and Team Legacy of SRCC was in the second position. Winners were given cash prizes and hampers in the closing ceremony.



9. Webinar on 'Navigating Gender Data: Discussion on Gaps and Biases in Databases'

On 14th April 2023, the Department of Economics, Kalindi College, held an interactive speaker session on 'Navigating Gender Data: Discussion on Gaps and Biases in Databases'. The event was held online and attracted the participation of over 60 attendees. The audience engaged with the distinguished speakers, Tawheeda Wahabzada and Divyanshi Wadhwa, on how gaps and biases manifest in facts and figures.

Tawheeda Wahabzada, data and policy specialist at Open Data Watch, began the session with a presentation on gender data and ongoing projects from Open Data Watch. Following the presentation, the organising team hosted a Q&A session where Ms Wahabzada answered questions from the curious attendees with insights and knowledge from her experience.

Divyanshi Wadhwa, a data scientist at the World Bank, shared insights on the interlinkages of gender and social and development goals, such as the SDGs. The speaker shed light on the World Bank's work on gender equality and data gaps. Following the session, the organising team hosted another Q&A session where Ms Wadhwa engaged with the intriguing questions of the attendees.

The session ended with a vote of thanks delivered by the Faculty Advisor of the Editorial Board of KaCES, Ms Phunchok Dolkar.





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Department of Economics, Kalindi College University of Delhi (2022-23)

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