CIVIL SERVICE INSTITUTE PALA

Under IDCHRD Trust

CURRENT AFFAIRS

A Handbook

Silver Jubilee Edition 1998-2023

25
Years of Excellence with
339
Success Stories

Full-Time Course

One-year intensive coaching for civil services exams

Admission Started!
Attend FREE Bridge Course NOW!

CURRENT AFFAIRS
A Handbook

Prepared by the Civil Service Institute Pala

Editorial Board

1. Dr. V.V. Georgekutty Ottalankal, Principal - Chief Editor
2. Dr. Mathew Joseph, Associate Principal - Co-editor
3. Dr. Baby Thomas, Vice-Principal - Co-editor
4. Sri Jubin James, Chief Acadamic Co-ordinator
5. Sri Subin S., Faculty & Mentor
6. Smt. Sreelakshmi N., Faculty & Mentor
7. Sri Noel Thomas, Faculty & Mentor
8. Sri Ranjith Premnavas, Faculty & Mentor - Sub-editor

* Not for Sale
* For Private Circulation Only

CONTENT

A Foreword

Welcome to the inaugural issue of the Handbook on Current Affairs, an academic journal of a new kind. With its broad scope of bridging concepts with current affairs in the varied subjects that are relevant for competitive examinations, job interviews and campus placement, the journal is devoted to a challenge rather than to a topic or to an interception of topics. The challenge is to address minds filled with information and transform them to be analytical, innovative, critical and creative. Mere assimilation of knowledge is insufficient to meet the requirements of employers. Instead, one should acquire the capability to address problems with a positive attitude and latest skillset and information. In a real-world situation of problem solving, concepts play only half of the role, the other part is played by current developments and trends. Without knowing the current affairs, a graduate or post-graduate may not establish himself/herself as a competent candidate in the area of study and employment. In the present system of university education, owing to the hindersome process of curriculum update, students may not get even an overview of the major events in the current world. There are currently a number of publications that bring articles on current developments on a defined topic. But an easily accessible book that gives an overview on the current developments of selected subjects that are widely considered important for job interviews and campus placement as well as for general essay type university questions is seldom found. This handbook is an effort of the Civil Service Institute Pala to supplement the knowledgebase of the students in colleges and universities with a note on the significant current developments in varied subjects. The inaugural issue includes papers on Economics, International Relations, Polity, Science and Technology, Environment and Disaster Management, Education and Sociology. We believe that this book will help students to improve their competencies by spending less time and effort and it is strongly

recommended for final year UG and PG students in Kerala who are getting ready for their final examinations and job interviews.

We bring out this book for the academic community in commemoration of our Silver Jubilee celebrations. This book is not for sale and it is made available to all final year UG and PG students in Kerala who are desirous of attending job interviews including campus placements as well as competitive examinations such as civil services examinations as a ready reckoner.

Using the journal inauguration as an occasion, I would like to thank many persons, including Msgr. Sebastian Vethanath (Manager of the Institute), Dr. Cyriac Thomas (Director), Fr. Mathew Alappattumedayil (Joint-Director), Dr. Mathew Joseph (Associate Principal), Dr. Baby Thomas (Vice-Principal), experts who contributed articles, and the Editorial Board consisting of the mentors and faculty members, who made this maiden work a reality.

Dr. V. V. Georgekutty Ottalankal
Principal, CSIP
(Former Controller of Examinations, University of Calicut)

A Constitution Unique - Governor: An Academic Overview

Dr. Cyriac Thomas
Director & Academic Dean, CSIP
(Former Vice-Chancellor, Mahatma Gandhi University, Kottayam)

Introduction: Constitutionally, the structure of the State Government is broadly similar to that of the Union Government. All the three organs of government; legislature, executive and judiciary; are replicated in the states also. In functional terms too, the principle of representative and responsible government umpired by the judiciary is to operate on parliamentary lines along with federal linkages between the two orders of governments under the Constitution. There are some differences as well. The parliamentary principle of government at the state level is carried on under a centrally appointed Governor who has an important supervisory role as a national observer in normal times and becomes the chief executive during the period of constitutional emergency. The constitutional role of the Governor has been precisely explained and stipulated in Articles 153 to Article 217.

Constituent Assembly Debates: The original plan in the Draft Constitution was to have elected Governors. But in the Constituent Assembly debates, it had discussed four alternative methods for selecting the Governors. T.T. Krishnamachari, Satyanarayan Sinha, L. Krishnaswami Bharathi, K.T. Shah, and Pandit Thakur Das Bhargava etc. put forward their own arguments on various alternatives. They were election of the Governor by adult suffrage, election by the members of the lower legislature or by both the Houses either by the system of proportional representation or otherwise, selection by the President out of a panel submitted by the State Legislative Assembly and appointment by the President. After discussing the pros and cons of each alternative at length by the Constituent Assembly, Dr. Ambedkar concluded the discussion and the Constituent Assembly unanimously adopted the last alternative.

The Constituent Assembly settled for the idea of a centrally appointed Governor who, in normal circumstances, would be bound by the advice of the Chief Minister and the Cabinet collectively enjoying the confidence of the majority party or coalition in the state assembly. Thus, the Chief Minister and the Cabinet were constitutionally mandated to be the chief executive of the state government except during the periods of constitutional emergency.

Reasons for an Appointed Governor

1. It would save the Country from the evil consequences of another election, run on personal issues and would be highly detrimental to the country's progress.

2. If a Governor were to be elected by direct vote that may perhaps lead to frequent friction between the Governor and the Chief Minister.

3. The expenses involved in the machinery of election would be out of proportion to the powers vested with Governor to act as a mere constitutional head.

4. A Governor elected by the people to be at the top of the political life in the state might prefer to act as a super Chief Minister.

5. Through a procedure of appointment by the President, the union government would be able to maintain intact its control over the states.

Arguments against nomination by the President

1. A nominated governor would not be able to understand the needs of the state.

2. There is a chance of friction between the Governor and the Chief Minister of the state, if they do not belong to same political shade or ideology.

3. An appointed Governor under the instruction of the Centre might like to run the administration in a way contrary to the wishes of the state cabinet.

The Governor and the Centre-State Relations

The role and position of the Governor in relation to the Centre can be described as a particular phase of Centre-State relation. When India became independent the immediate need was to achieve unity in its inherent diversity. Therefore, "the founding fathers, responded through a federal structure of the government in the country, which because of the compulsions of history and tradition had to be Centre oriented." This led some constitutional experts to remark that "India is a unitary State with subsidiary federal features rather than a federal State with subsidiary unitary feature."

It has been said "that the office of the Governor is not meant to be merely ornamental"…..He/she must act with skill and detachment his dual responsibility towards the Centre and to the State executive, of which he is the constitutional Head.This duality in his role is perhaps its most important and certainly its most unusual feature. It would be wrong to emphasize one aspect of the character of his/ her role at the expense of the other and the successful discharge of his/ her role depends on correctly interpreting the scope and limits of both." The importance of the Governor's duties as a representative of the Centre invests him/ her"with a significance for national integration and for the preservation of national standards in public administration that has not received enough recognition so far."

The necessity to understand the constitutional status of the Governor arises from the circumstances that the Governors are often called agents of the Centre acting at their behest either in the formation of the Ministry or the dissolution of the Ministry or promulgation of the President's rule. Some of the contradictory postures taken by Governors in the past in relation to the above subjects under identical situation have generated an atmosphere of suspicion and criticized by the public.

Thus, the Centre-State conflicts largely turn upon the actions of the Governor. Every State which is ruled by a Party other than that in power at the Centre attributes political motives to

the Governor's actions and suggests that they are dictated by the Union Government. Several jurists have pointed out that "there is absolutely nothing in the Constitution to make the Governor of a State an agent of the Central Government. The relations between the Union and the States have been described and dealt with in detail in part XI of the Constitution. A Governor both by virtue of his/ her office as contemplated by the Constitution and by virtue of the oath he takes has to function as the Head of the particular State, exercising those powersand discharging those functions which are attached to his office. In the context of the federal structure of the Indian Constitution and with the possibility of the Party in power at the Centre being different from the Party in power in a particular State, to leave the appointment of a Governor to the Central Government and make him/ her an agent of that Central Government, holding his/ her office during the pleasure of the Central Government, will be completely subversive and totally destructive of the federal frame work of the Indian Constitution and the autonomy of States contemplated therein.

Various Commission recommandations on Governor's Role

1. AdministrativeReforms Commission

The first Administrative Reforms Commission (1966) in its report on "Centre-State Relationships" had recommended that once the Governor completes his/her term of five years, he/she shall not be made eligible for further appointment as Governor. This was to address the challenge of possible politicisation of the office of the Governor.

2. SarkariaCommission on Centre-State Relations

The Sarkaria Commission was set up in 1983 by the Union government to examine the central-state relationship on various portfolios and suggest changes within the framework of the Constitution of India. Given the role played by the office of the Governor in the Centre-State relationship, the Commission made several related recommendations.

The Sarkaria Commission recommended that the Governor appointee should be an eminent person in some walk of life and that he/she should be from outside the respective State. The person should be a detached figure without political links or should not have taken part in politics in the recent past. It condemned the practice of Governors venturing into active politics as well as ascending to other offices after the completion of the term. Suggesting measures to safeguard the neutrality of the Governors, the commission argued for a secure term for the Governor. Regarding the Governor's role as the Chancellor of State universities, the Sarkaria Commission suggested that it was desirable to consult the Chief Minister or the minister concerned, though it shall be left to the Governor to act on the same or not.

3. National Commission to review the working of the Constitution

The National Commission to review the working of the Constitution (NCRWC), also known as Justice Venkatachaliah Commission was set up in 2000 for suggesting possible amendments to the Constitution of India.The National Commission also reiterated the view of the Sarkaria Commission regarding the appointment of the Governor. Additionally, it argued for stipulating time limits for the Governors to give assent to pending bills and for the Bills pending Presidential assent under Article 201 of the Indian Constitution.

The Punchhi Commission

The Government of India constituted the Punchhi Commission on Centre-State relations in 2007 to look into the new issues of Centre-State relations keeping in view the changes that had taken place in the polity and economy of India since the Sarkaria Commission. Punchhi Commission reaffirmed most of the recommendations of the Sarkaria Commission. The Commission expressed concerns over the practice of Governors being called back with a change in governments at the Centre. This, it felt did not align with the salutary position assigned to the Governor. Taking one step ahead of the Sarkaria Commission's recommendation

that the Governor's tenure of five years shall only be sparingly cut short, Punchhi Commission recommended that the Governor shall have fixed tenure to protect the Governor from any pressure from the Central Government. It proposed an amendment to Article 156 to incorporate a well laid out procedure to remove the Governor from office.

Related Supreme Court judgments

S.R. Bommai case: In 1994, nine-judge Constitution Bench of the Supreme Court in the S. R. Bommai case, put an end to the arbitrary dismissal of State governments under Article 356 by spelling out restrictions. The President's Rule was imposed in States over a hundred times prior to 1994. The Supreme Court declared that the imposition of the President's Rule shall be confined only to the breakdown of constitutional machinery.

Conclusion: Constitution visualizes a double headed executive in the Governor and as Chief Minister, formally similar to that of centre. In normal times, the real executive power of the state government is exercised by the Chief Minister and the cabinet who are supposed to work under the pleasure of the Governor, but his pleasure is dependent on the confidence of the House. Only when the confidence of the legislative assembly lost by the Chief Minister and the cabinet, the pleasure of the Governor could be withdrawn. Only during constitutionally contemplated emergencies, the pleasure of the Governor is not bound by the confidence of the non- existent House, which, during an emergency, may either be dissolved or kept in suspended animation. In such an eventuality, the Governor becomes directly answerable to the Union Government. It is this way that the Governor of the state is to serve both as an agent of the centre and of the head of the state government.

According to Dr. B. R. Ambedkar,"the Governor under the Constitution has no function which he can discharge by himself; no functions at all. While he has no functions, he has certain duties to perform, and the House will do well to bear in mind this distinction."

Judicial Appointments: Collegium or National Commission?

Dr. K.C.Sunny

Professor of Law, Central University of Kerala

Appointment to the higher judiciary is a fertile area for litigation since the 1980s. The Constitution envisages a system that provides a major role to the executive and judiciary in this regard. The relevant provision reads thus:

Article 124 of the Constitution

(1) There shall be a Supreme Court of India consisting of a Chief Justice of India and, until Parliament by law prescribes a larger number, of not more than seven other Judges.

(2) Every Judge of the Supreme Court shall be appointed by the President by warrant under his hand and seal after consultation with such of the Judges of the Supreme Court and of the High Courts in the States as the President may deem necessary for the purpose and shall hold office until he attains the age of sixty-five years.

Provided that in the case of appointment of a Judge other than the Chief Justice, the Chief Justice of India shall always be consulted.

Article 217 of the Constitution,dealing with the appointment of the High Court states that "every Judge of a High Court shall be appointed by the President by warrant under his hand and seal after consultation with the Chief Justice of India, the Governor of the State, and, in the case of appointment of a Judge other than the Chief Justice"

In the early years of the constitutional system of governance,a definite procedure was followed for the appointment to the higher judiciary. According to that procedure, the formal proposal for filling up the vacancy in the Supreme Court is initiated by the Chief Justice of India by recommending

the name of the person found suitable by him to the Minister of Law and Justice. If accepted, the recommendations will be forwarded to the Prime Minister of India. If the proposal is accepted by the Prime Minister, he may advise the President to issue a formal warrant of appointment. Similarly, in the case of the appointment of a Judge to the High Court, the formal proposal will be emanated from the Chief Justice of the High Court and that proposal will be considered by the Chief Minister of the State duly processed through the Governor and forward it to the Chief Justice of India (CJI) through the Ministry of Law and Justice. The Minister of Law and Justice, if he agreed with the recommendation forwards the proposal to the Prime Minister who then, if he approved that proposal, may tender advice to the President to issue a formal warrant

So far as the proposal initiated by the CJI for the appointment of a Judge of the Supreme Court is concerned, if at there is any disapproval that will only be from the side of the Central Government. In case of an appointment of a Judge to the High Court, since the proposal has to emanate from the Chief Justice of the High Court, the question of disapproval, if any, may arise either from the State Government, the CJI, or the Central Government.

Another crucial issue was the meaning of the term consultation used in Art 217. In *S.P Gupta v. Union of India* (known as the first judge's case) decided on 30th December 1981 by a seven-judge Bench, the Apex court held that the opinion of the CJI doesn't have primacy and the word "consultation" doesn't mean "concurrence. So, President's decision would prevail. It was pointed out that the Executive is accountable and the judiciary has no accountability.

However, in *Supreme Court Advocates on Record Association v. Union of India* (known as the second judges' case) decided on October 6, 1993, by a nine-judge Bench, overruled the earlier judgment given in the first judges' case by a seven-judge bench. This resulted in the emergence of a collegium system in which

the senior Supreme Court Justices had the final word on appointments to the higher judiciary. The next judgment in the series, the third judges' case decided on 28th October 1998 by a nine-judge Bench, the decision of the judiciary was considered primal.

Subsequently, the collegium system was replaced with the National Judicial Appointment Commission (NJAC) by the Constitution (Ninety-Ninth Amendment) Act, 2004. In *Supreme Court Advocates-on-record Association & Anr. vs. Union of India* (known as Fourth Judges Case) the petitioner contended that the amendment of the Constitution for establishing the National Judicial Appointment Commission is null and void.

The Supreme Court ruled in favour of the petitioners by a vote of 4:1, identifying that Article 124A is the crucial provision of the 99th Amendment. The Court also denied the respondent's request for a larger bench to reconsider the Second and Third Judge's cases. The collegium system for the judicial appointment was revived.

Going by the majority decision of 4:1 the Supreme Court declared:

The constitution (99th Amendment), 2014 is unconstitutional and void.

2. The National Judicial Appointment Commission Act, 2014 is unconstitutional and void."

3. The 'Collegium system' for the selection and appointment of judges to the Supreme Court and Chief Justice/ Judges and transfer of Chief Justice/ Judges stands revived and is thus, operative.

4. Primacy of the judiciary in the appointment of Judges under Articles 124, 217, and 222 of the Indian Constitution forms part of the independence of the judiciary which is the core part of the basic structure of the Constitution of India.

The decision caused to generate severe criticism. The critics pointed out that the system of judges appointing their fellow

judges is undemocratic. It is relevant to note that in France, as per Article 34 of the French Constitution, the appointment of judicial officers takes place based on recommendations from Conseil Superieur de la Magistrature to the President. The body consists of 16 members, the President, the Minister of Justice, and 16 other members that include four public prominent figures, six deal with the recommendation of the public prosecutor, and the remaining six deal with the recommendation of sitting judges. Likewise, the United Kingdom also follows the same procedure for appointment as per Constitutional Reform Act, 2005 (UK). In the UK, Lord Chancellor, after consulting the commission, notifies the Prime Minister of the recommendation of the commission.

In the United States, the procedure regarding selection is more transparent. Here, hearings in the Senate are conducted for the persons selected by the President, and further citizens are invited to give their opinion on their political and professional lives.

So, the arguments in favour of the National Judicial Appointment Commission have support of the practices followed in other major democracies. Be it Collegium or NJAC, transparency must be ensured in this process. Judge appointments are not a matter to be done secretly, like making an atomic bomb. It should be transparent and participatory. The criteria for appointment should be made public. Let there be a public discussion about the merits of the judges.The process is the key. Who selects the judges? How is it done? Is it possible for aspirants to apply and the public to file objections against applicants? All these questions are relevant.

■

Kerala Budget 2023-24: A Review

Dr. K.K. John

Principal, Saintgits College of Applied Sciences,
Pathamuttom, Kottayam

(Former Head, Dept. of Economics, St. Thomas College Pala)

Sri K. N. Balagopal, Minister for Finance presented the state budget for 2023-24 on 3rd February 2023. In the Economic Review 2022, it was stated that the Gross State Domestic Product (GSDP) was growing at 12.01% in 2021-22 compared to (-8.43 %) in 20-21 and 2.19% in 2019-20.

The state of Kerala had to go through a very difficult period due to Okhi in 2017, the demonetization of 2016, the introduction of GST in 2017, floods in 2018 and 2019 and the COVID pandemic in 2020 and 2021. The revenue deficit grants as recommended by the XV Finance Commission ended in 2023-24 and the GST compensation ended in June 2022. There is a further threat of the reduction of the borrowing limit of the state from the present rate of 3.5% to 3.0 % by 2025-26. However, in terms of poverty, Kerala is the state with the lowest poverty in India.

The finance commission is a constitutional mechanism to reduce the financial imbalance in federal finance. The state of Kerala has a serious grievance that the share of the state in devolution which was 3.87% during the X Finance Commission (K C Pant) drastically declined to 1.92% during the XV Finance Commission (N K Singh). It is to be remembered that the state of Kerala had revenue surplus up to 1979 after the devolution of the award of the VII Finance Commission (Justice J. M. Shelat Commission). But the lack of financial discipline and reckless spending put the state into a huge debt burden. Every year, the borrowing is increasing in the name of planned development.

The following table shows that on average, only 20% of such borrowings are used for development purposes and the major share was spent on other items of revenue expenditure.

Year	Amount of borrowing	The amount for in (Crores of Rs.)	Percentage Plan Purposes
2017-18	30233	8748	28
2018-19	33445	7430	22
2019-20	60407	8454	14
2020-21	69735	12889	18
2021-22	64932	14191	21

(Source: Kerala State Planning Board, 2022)

Though the state is in an acute financial crisis, there have been no sincere efforts on the part of the government to overcome the fiscal crisis. On account of the lack of structural reforms in IGST, the report of the State Expenditure Review Committee (2022)estimated that the loss of revenue is to the extent of Rs. 25000/-crores. Similarly, the report of the Accountant General of Kerala shows that an amount of Rs. 21797.86 crores is due to the state from several sources. If we calculate the due amount during the last five years alone it will be Rs.7100.32 crores. It is worth mentioning that the amount expected in the present budget from the cess on petrol and diesel (Rs. 2 per litre) is only Rs 750 crores. This proposal has attracted wide criticism from different angles.

Government of India under Sri. Narendra Modi abandoned the five-year plans in the middle of the 12th five-year plan. But the state government is continuing with the five-year plans. The fourteenth five-year plan (2022-27) is in progress. For the current financial year 2022-23, against the annual outlay of Rs. 39640/-crores, only 56% of the amount has been spent up to 2023. The fiscal discipline of a state is measured based on the revenue deficit and fiscal deficit. The revenue deficit increased to 2.5% of the GSDP in 2021-22 and the fiscal deficit stood at 4.4% in 2020-21 and 3.5% in 2021-22. Another measure of fiscal health is the debt burden. The total debt of the government at the end of March 2022 is Rs. 3,35,641.15 crores as against Rs. 1,86,453.86 crores in March 2017.

Salient features of the State Budget 2023-24

It was in the context of the fiscal crisis that the Hon'ble minister presented the budget for 2023-24. The expected revenue receipts are estimated at 1,35,418.67 crores as against Rs. 1,29268.15 crores in the revised estimates for 202-23. The revenue expenditure is estimated at Rs. 159360.91 crores against the amount of Rs. 149183.68 crores for 2022-23. Hence, there is a revenue deficit of Rs. 23942.24 crores.

The estimated additional expenditure is to the tune of Rs.2640 crores and additional resource mobilization is to the extent of Rs. 2955 crores. The projected GSDP at current prices is estimated at 11.3 lakh crores. The fiscal deficit is estimated at 3.5% of the GSDP and a revenue deficit of Rs. 2.1% of the GSDP.

Regarding the additional resource mobilization, the Finance Minister followed an easy path of imposing a burden on all sections of the community by increasing water charges, electricity charges, cess on petrol and diesel, property taxes, motor vehicles taxes, state excise on liquor, land registration etc. The price of petrol and diesel is already the highest among southern states.

As the purchasing capacity of all the low-income groups including the small farmers is declining, all the sections of the people expected at least a marginal increase in the social security pension and pensions of the welfare boards. The 50.66 lakh security pensioners and 6.73 lakh pensioners of the welfare boards are unhappy over the budget proposals. The state employees and pensioners were expecting additional installments of DA/DR and arrears of pension.

The new schemes in the budget like Make in Kerala, Year of Entrepreneurship with 1 lakh new enterprises, EV industrial park, international research scholarships for promoting research, National High Way Development, Trade fairs, work near home, Nava Kerala Nagara Nayam, Nerkazhcha (A Comprehensive scheme for Eye Health) allocation for menstrual cups are worth mentioning. But the allocation of funds under each item is meagre.

At the time of the introduction of the 'Peoples' Plan' in 1996, the former Chief Minister and veteran CPI (M) leader the late Sri E. M. S. Namboodiripad strongly demanded that there should be perfect decentralization of power to strengthen the local self-governments and that the number of ministers in Kerala should be limited to 10 or 11. He also appealed that ministers should not be invited for inaugural functions at the grass root level. But even after 27 years of the so-called decentralization of power, the idea remains only on paper. The cost of administration is increasing year by year. THE FRBM Act of 2003 specified that fiscal deficit should be phased out and fiscal deficit should be limited to 3% of the GDP at the national level and GSDP at the state level. But all these are easily forgotten at all levels.

■

Union Budget 2023-24: An Overview

Ranjith Premnavas
Faculty & Mentor, Civil Service Institute Pala

In Article 112 of the Indian Constitution, the Union Budget of India, also known as the Annual Financial Statement, is a summary or plan of the anticipated resources (often but not always from taxes) and expenditures of the government. The Government presents it on February 1st,for it to be implemented before the start of the next fiscal year in April. The nodal entity in charge of creating the budget is the budget division of the Department of Economic Affairs (DEA) within the Ministry of Finance.

The Union Budget of 2023-24 was presented at a juncture where the Indian economy was primarily seen as one that was decoupling from the world in terms of growth. Prime Minister Narendra Modi's vision of India@100, which is built on the pillars of inclusion and prosperity, is obviously the foundation of the Budget paper. Shri. Nirmala Sitharaman began her speech by calling this the 'first Budget of AmritKaal' and a blueprint for India @ 100. The budget has seven priorities, which she called the 'SAPTARISHI' (the seven rishis, or seers, of ancient India who is extolled in the Vedas).

KEY SCHEMES AND THEIR BUDGETARY PROVISIONS

INFRASTRUCTURE: The National Housing Bank (NHB) will establish an Urban Infrastructure Development Fund (UIDF)for the utilisation of priority sector financing shortfalls, like the Rural Infrastructure Development Fund (RIDF). FM also announces 50 additional airports, water aerodromes, and landing grounds to be revived for regional air connectivity.

RAILWAYS: A record financial allocation of 2.40 lakh crore has been proposed for the Indian Railways in the Union Budget. With rising passenger demands, the Railways plans to renovate more than 1,000 coaches of high-end trains including the Rajdhani,

Shatabdi, Duronto, Humsafar, and Tejas.

AGRICULTURE: An Agriculture Accelerator Fund would be set up to encourage agri-startups by young entrepreneurs, and Digital public infrastructure to be developed for the agriculture sector. Over the next 3 years, 1 crore farmers would be facilitated to adopt natural farming via 'Bhartiya Prakritik Kheti Bio-Input Resource Centres'. Indian Institute of Millet Research will be supported as a centre of excellence."PM Programme for Restoration, Awareness, Nourishment, and Amelioration of Mother Earth" (PM-PRANAM) will be launched to incentivize States andUnion Territories to promote alternative fertilizers and balanced use of chemical fertilizers.

EDUCATION: To give kids nation wide access to high-quality literature, a national digital library for kids and teenagers will be established. For the 740 Ekalavya Model Residential Schools, which serve 3.5 lakh tribal students, the centre will hire 38,800 teachers and support personnel over the next three years.

HEALTH: 157 new nursing colleges will be established in co-location with the existing 157 medical colleges established since 2014. A mission has been announced to eliminate sickle cell anemia by 2047, which will include a universal screening of seven crore persons between the ages of 0 and 40 years in affected tribal areas.

TRIBAL WELFARE: Pradhan Mantri Primitive Vulnerable Tribal Group (PMPVTGS) mission has been launched to improve the socio-economic condition of the particularly vulnerable tribal groups.

INCOME TAX: The new tax regime would be the default, while taxpayers would still have the option of the old regime. The slabs under the new tax regime have been tweaked. The government has increased the income tax rebate limit from Rs 5 lakh to Rs 7 lakh under the new tax regime.

BANKING: The FM has also proposed certain amendments in the banking Acts, and RBI Acts to improve governance in the banking sector and enhance investors' protection and there is no

word on bank privatisation in the budget.

Micro, Small, and Medium Enterprises (MSMEs): In a big relief to Covid-hit micro, small and medium enterprises (MSMEs), the Credit Guarantee Scheme for MSMEs will be extended with an infusion of Rs 9000 crore.

DATA: The Budget proposes a National Data Governance Framework for access to anonymised data.

DEFENCE: The allocation for the procurement of advanced weapons systems, military hardware, and Equipment has been increased. Measures to promote indigenous defense production, such as tax incentives or subsidies for domestic manufacturers, and investment in research and development to develop new technologies and products for the defense sector.

ENERGY SECTOR (GREEN GROWTH)

Green hydrogen, clean energystorage, and transmission are the key drivers of the government's "GreenGrowth" priority sector. With an outlay of Rs.19,700 crore, the National Green Hydrogen Mission will facilitate the transition of the economy to low carbon intensity,reduce dependence on fossil fuel imports and make the country assume technology and market leadership. Five hundred new 'waste to wealth' plants under GOBARdhan (Galvanizing Organic Bio-Agro Resources Dhan) scheme will be established for promoting a circular economy. The government plans to introduce a 5 percent compressed biogasmandate for all entities marketing natural gas in India.

Tourism: States will be encouraged to set up a 'Unity Mall' in the State capital or the most popular tourist destination in the state for the promotion and sale of 'One District, One product' and GI products and other handicrafts.

Other Important Schemes envisaged in the Budget

The government will take up mangrove plantations along the coastline under the new **MISHTI scheme** which is aimed at preserving the Mangrove vegetation in India. The **Amrit Dharohar scheme** aims to encourage the optimal use of wetlands, and

enhance biodiversity, carbon stock, eco-tourism opportunities, and income generation for local communities. **PM Vishwa Karma Kaushal Samman-package** of assistance for traditional artisans and crafts people have been conceptualized, which will enable them to improve the quality, scale & reach of their products, integrating with the MSME value chain. A '**National Apprenticeship Promotion Scheme**' to provide stipend support to 47 lakh youth in three years, Direct Benefit Transfer under a pan-India National Apprenticeship Promotion Scheme is being proposed. **National Financial Information Registry** will be set up to serve as the central repository of financial and ancillary information. This will facilitate an efficient flow of credit, promote financial inclusion, and foster financial stability.

The economy is confronting both internal and external difficulties. Foreign issues like the 'New Cold War' and the ongoing conflict in Ukraine are making things worse for India. Another issue with the balance of payments is that large current account deficits cause reserves to shrink and the value of the rupee to fall. The reasons behind the internal problems are inherent in India's economic progress. Only recently has the rate of inflation begun to decline after being at high levels for most of 2022–2023. The organised sector, which barely employs 6% of the workers, is often favoured more. In conclusion, given the ambiguous global climate, there have been significant macroeconomic issues during 2022–2023 and these are anticipated to continue in 2023–2024. Regarding these, the only thing that can be done is to strengthen the economy and make it a resilient one.

Start-Ups: Ecosystem, Incentives, and Strategies

CA Jomon K George

Chartered Accountant, Former Chairman, Southern Region of
The Institute of Chartered Accountants of India

India, today has the third largest start-up ecosystem in the world with approx. 55000 start-ups, out of which there are 100 plus unicorns.

Projections indicate that by 2025, India may well have 100,000+ startups, employ 3.25+ million people, and produce 100+ unicorns, with a total market value of approx. $ 500 billion. **(Rs.41,00,000 Crores)**

By definition, an entity shall be considered a Startup:

- Up to a period of ten years from the date of incorporation/ registration, if it is a private limited company/ partnership firm/LLP, in India.

- Turnover of the entity for any of the financial years since inception has not exceeded Rs. 100 Crores.

- Entity is working towards innovation, development, or improvement of products or processes, or services/it is a scalable business model with a high potential of employment generation or wealth creation.

Note: ***An entity formed by splitting up or reconstruction of an existing business shall not be considered a 'Startup'.***

The Union Government has rolled out a good number of incentives and schemes for start-ups.

Start-Ups come under the Department of Promotion of Industry & Internal Trade (Formerly DIPP) under the Ministry of Commerce& Industry.

They enjoy the following benefits:

Income Tax

- Deduction of 100% of the profits under section 80 IAC of The

24

Income Tax Act for three consecutive Assessment Years (AY) out of ten AYs since inception.

- ESOPs/Sweat Equity is taxed only on/after the Sale of Shares/ Leaving Employment/4 AYs. (Section -192 (1C)
- Angel Tax is not attracted on Securities Premium in the hands of the Start-Up if the declaration is filed in Form 56 and approval is obtained.

Company Law

- Start-Up company is exempted from preparing Cash Flow Statements, annually.
- Not required to hold a minimum of four meetings of the board of directors in a year

Foreign Exchange Management Act (FEMA)

- Start-Up company can borrow up to USD 3 Million per financial year for a minimum maturity of 3 years.
- Foreign Venture Capital investors are allowed to invest in start-ups irrespective of any sector without the approval of the RBI

Certain Other Benefits

- 80% Rebate for the Cost of filing patents.
- 10,000 crore rupees fund is set up by the government to provide funds to the startups as venture capital.
- Exempted from the "prior experience/turnover" criteria applicable for normal companies answering government tenders.

Here are a few tips which may be useful for those who aspire to build up well-structured and compliant entities:

1.   Business Plan/Pitch Deck

Even if your proposal is relatively small, you must prepare a business plan. It should cover the possibilities of the business, the expected challenges/problems, the Cost of the Project, Means of Finance, Staff requirements, Revenue model, Expenses, Likely Profit, etc.

If there are partners, then all of you should be involved in preparing and understanding the business plan. The new term is **"Pitch Deck"**. You may consult a technical/financial expert in preparing the business plan.

2. Constitution & Preliminary Understandings

Goes without saying that mutual trust and transparency are the key factors in any association

The entity can be a Sole-Proprietorship, Partnership Firm, LLP, Private Limited Company, etc. A clear decision must be made on the constitution.

One should also define and determine the capital contribution, profit-sharing ratio, and responsibilities of operations, finance, business development, and marketing. If this is not done, the situation of '*Everybody thought Somebody would do it but finally,nobody did it'* can emerge. Also, decide on the mode of operation of the bank accounts.

3. Meetings and Minutes

It is strongly advisable to have formal meetings in the initial stages of the project. All the decisions and resolutions must be properly minuted, signed by all, and kept for internal records

4. Internal Controls and Financial Discipline

There should be robust controls in all areas of operations.

Account for all the transactions … Avoid excessive spending … practice prompt billing … Avoid undue credit to customers … All this should become the culture of the organization.

It is not at all advisable to borrow funds at higher rates of interest.

There should be a practice of extracting the monthly trial balance, profit and loss statement, balance sheet, cashflow, and partners' accounts and discussing them in the promoter's meeting.

5. Compliance with Applicable Statutes

The regulatory framework and compliance requirements are

quite complex in our country.

Every organization should try to work within the framework of Company Law, Income tax, GST, Labourlaws, etc.

Permanent Account Number (PAN and Tax Deduction Account Number (TAN10 should be taken.

Once applicable, GST registration should also be taken.

Make sure that there's a system to file the returns of GST, Provident Fund, ESI, and TDS. The internal awareness of these requirements is very crucial &essential.

■

The Saga of the Indian Stock Market

Dr. Tomy Mathew
Former Head, Dept. of commerce and Controller
of Examinations, CMS College Kottayam

Introduction

The stock exchange or market is a place where stocks, shares, and other long-term commitments or investments are bought and sold. To trade the securities, the company should be listed on the stock exchange. There are two major stock exchanges in India viz. the Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE). As of December 31, 2022, around 5,300 companies have listed their shares on the Bombay Stock Exchange with a combined market capitalization of around Rs. 2,82,13,564 crores and around 2,100 companies have been listed on the National Stock Exchange with a total market capitalization of Rs. 2,75,67,268 crores.

Stock Exchanges are noted as "an essential concomitant of the Capitalistic System of the economy. It is indispensable for the proper functioning of corporate enterprise. It brings together large amounts of capital necessary for the economic progress of a country. It is a citadel of capital and a pivot of the money market. It provides necessary mobility to capital and directs the flow of capital into profitable and successful enterprises. It is the barometer of general economic progress in a country and exerts a powerful and significant influence as a depressant or stimulant of business activity."

History of the Indian Stock Market

The Indian stock market traces its history back to the late 18th century when the trading floor was under the shade of a sprawling banyan tree opposite the Town Hall in Mumbai. A few people would meet under this tree to informally trade in cotton. This was because Mumbai was a busy trading port, and essential commodities were traded here often.

The Companies Act was introduced in 1850, following which investors started showing an interest in corporate securities. The concept of limited liability also put an appearance around this time. By 1875, an organization known as 'The Native Share and Stock Brokers Association' came into being. This was the predecessor of the BSE.

Regional Stock Exchanges

In 1894, the Ahmedabad Stock Exchange came primarily to enable dealing in the shares of textile mills in the city followed by the establishment of various regional stock exchanges. The Calcutta Stock Exchange was formed in 1908 and Madras Stock Exchange in 1920. Then stock exchanges were established in almost states such as Delhi, Hyderabad, Bangalore, Indore, Cochin, Kanpur, Pune, Ludhiana, Guwahati, Mangalore, Magadh, Jaipur, Bhubaneswar, Rajkot, Vadodara and Coimbatore and The Over the Counter Exchange of India (OTCEI). But many of the exchanges stopped trading with the introduction of electronic trading. Currently, most of the stock trading takes place in BSE and NSE.

Pricing of shares on the stock exchange

Stocks are priced the same way any commodity is priced globally i.e. governed by the principles of supply and demand. Market participants place to buy and sell orders which are also known as 'bid' and 'ask' respectively. Stock prices are determined by matching these buy and sell orders. The price of a stock at any point is the price at which a maximum number of shares can be transacted basis of the bids and asks at that time. After the price is arrived at, the open bid and ask positions are closed and the underlying transactions are completed. Thereafter, this price is displayed as the price of the stock for that moment. All this happens on a real-time basis with the help of electronic platforms

Regulatory framework and controls facilitating fair market conduct

The Securities and Exchange Board of India (SEBI)is vested with the responsibility of protecting the interests of investors in

securities and promoting the development of the securities market. SEBI safeguards the integrity of the markets by making regulations that help in detecting market frauds on a proactive basis, inspecting abusive or manipulative dealings in the securities market, and punishing the wrongdoers by taking disciplinary action. SEBI has been given legislative, executive, and quasi-judicial powers under the SEBI Act, 1992 to help it in fulfilling its duties.

Stock Market Index

A stock market index is a statistical tool that reflects the changes in the financial markets. The indices are indicators that reflect the performance of a certain segment of the market or the market as a whole.

A stock market index is created by selecting certain stocks of similar companies or those that meet a set of predetermined criteria. These shares are already listed and traded on the exchange. Share market indices can be created based on a variety of selection criteria, such as industry, segment, or market capitalization, among others.

Each share market index measures the price movement and the performance of the shares that constitute that index. This essentially means that the performance of any stock market index is directly proportional to the performance of the underlying stocks that make up the index. In simpler terms, if the prices of the stocks in an index go up, that index, as a whole, also goes up.

The performance of market indices acts as a nearly accurate indicator of the state of the markets and reflects the general sentiments of investors. These indices also provide investors with a wealth of information that helps them create and implement investment strategies.

Popular Stock Market Indices in India

India's stock markets have two benchmark indices - BSE Sensex and NSE Nifty.

Sensex is a blend of the words 'sensitive' and 'index'. It was introduced in 1986and is the oldest in India. The BSE Sensex

consists of the top 30 largest and most frequently traded stocks listed on the Bombay Stock Exchange (BSE).

Also known as the NSE Nifty, this share market index consists of the top 50 largest and most frequently traded stocks within the NSE. First created in 1996, NSE NIFTY is owned and maintained by India Index Services & Products Limited (IISL), which is a joint-venture organization between an Indian credit rating agency CRISIL and the National Stock Exchange. The CNX portion in the CNX NIFTY stands for CRISIL and NSE.

Stock Holding Pattern in the Stock Market

The stock holding pattern consists of retail investors, High Networth Individuals (HNIs), Domestic Institutional Investors (DIIs), and foreign Institutional investors (FIIs) or Foreign Portfolio Investors (FPIs).

Retail investors are individuals investing in the capital markets. Their goal is to invest their savings to get better returns. Securities Exchange Board of India (SEBI) defines retail investors as individuals whose application size in initial public offerings (IPO) is less than Rs 2 lakhs. Retail investors only own a 6% stake in the Indian markets. According to two depositories, NSDL and CDSL, the total number of Demat accounts is 9.28 crore as on April 30, 2022.

High Networth Individuals (HNIs): Investors' with over two crores of investible assets are generally considered as HNIs. Net worth is the amount by which your assets exceed liabilities. Individuals with investible assets of more than Rs.25 lakhs to Rs.2 crores are considered emerging HNIs'. The number of HNIs in India is predicted to touch 950,000 by 2027 according to a wealth report. Currently, the HNIs in India have crossed 330,000 as per 2020 data.

Domestic institutional investors (DII): These institutional investors generally make investments in the country they are based in. There are four main types of DIIs in the Indian stock markets.DIIs can either be: 1. Indian asset management companies (AMC), or .2. Indian insurance companies. 3. Pension

funds, 4. Banks. Scheduled commercial banks also invest a small portion of the deposits they receive in the stock market.

- Foreign Institutional investors (FIIs) or Foreign Portfolio Investors (FPI): These institutions are established outside India and make investments in India. FIIs are registered foreign institutions likePension funds and mutual funds, Sovereign wealth funds, and Hedge funds. Indian government appreciates foreign investment in Indian industries. FIIs own a 24% stake in the Indian markets. According to the DPIIT, FDI equity inflow in India stood at US$ 572.80 billion between April 2000-December 2021.

Market capitalisation

Market Capitalisation indicates the market value of all listed shares. The market capitalization of a company is found by multiplying the market value of a share by the number of shares outstanding. The market capitalization of all listed companies taken together is the market capitalizationofthe Indian corporate sector.

Indian Market Capitalization accounted for 3,308.013 USD bn in Jan 2023 (Rs. 271 lakhs crores approximately) whereas the Indian GDP is 3.8 trillion with a GDP market capitalization ratio of India Market Capitalization accounted for 103.8 % of its Nominal GDP in Dec 2022.

Depositories and Demat Accounts

In India, a demat account is mandatory to buy and sell shares of companies on stock exchanges. These demat accounts are offered only by two depositories in the country, namely the Central Depository Services Limited (CDSL) and National Securities Depository Limited (NSDL)

At present, the trade in the stock market is only in demat form. Physical shares are not traded in the Indian stock exchanges. To be traded in the stock exchanges, the securities are to be in the demat form maintained by depositories. As of now, there are two depositories in India, the National Stock Depository Ltd.,

(NSDL) and the Central Depository Services Ltd., (CDSL). The investor or trader should have an account in the depository. The depository accounts are operated by Depository Participants spread over the country.Stockbrokers, investment companies, and banks operate as depository participants. Over 900 depository participants are operating in India.

Conclusion

With over nine crore investors and around 8,000 listed companies, the Indian stock market is one of the largest stock markets in the world. The growth of the stock market is generally considered an indicator of the economic development of the country. Despite all the positive aspects, occasional scams and frauds are happening in the stock market. However, the government takes appropriate actions and brings in regulations to make the system more efficient.

■

Financial Inclusion in India: Achievements Made Through Efforts on Multiple Fronts

Prof. Tojo Jose, Alumni, CSIP

For every economy, over the last few decades, financial inclusion or providing basic financial services to the poor and marginalised segments has emerged as a major area of development policy in most developing countries. This is partly because the policymakers recognise that there is strong bondage between the financial empowerment of the people and economic development.

"Generating sustainable economic growth through increased financial inclusion has, of late, become the central mantra of the regulators and policymakers, not only in India but across the globe." – observes former Deputy Governor of the RBI, Dr. KC Chakravarthy who made pioneering works in financial inclusion.

The renewed energy is visible as governments and financial sector regulators, including central banks, are designing various financial inclusion programmes on different fronts. They expect that bringing and activating the poor and the marginalised under the network of the formal financial sector will connect them with the mainstream economic development process.

Better access to financial services for both individuals and firms will help to reduce income inequality and to accelerate economic growth. According to the World Bank, "Financial inclusion has been broadly recognised as critical in reducing poverty and achieving inclusive economic growth. Financial inclusion is not an end in itself, but a means to an end—there is growing evidence that it has substantial benefits for individuals." (World Bank, Global Findex Database 2014).

What is financial inclusion?

Financial inclusion is the process of providing financial services and products to the unserved and the under served. It indicates the proportion of the total population, connected to

the formal financial system in an economy. Financial inclusion is now considered essential for inclusive development.

"Financial inclusion may be defined as the process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups such as weaker sections and low-income groups at an affordable cost." (The Committee on Financial Inclusion, Chairman: C Rangarajan).

In India, the UN's comprehensive approach to financial inclusion was adopted by the government. Here, financial inclusion is not limited to bank accounts. Rather it includes other financial products and services like payments, credit, insurance etc. The three elements that are present in the present efforts towards financial inclusion in India are:

(a) broadening of financial services to those who do not have access to the financial sector;

(b) deepening of financial services for people who have minimal financial services; and

(c) financial literacy and consumer protection.

There is a huge gap in access to financial services in the country, with a major proportion of the villages not having access to bank branches and a large proportion of families remaining socially or economically excluded. The population size and its rural orientation coupled with a lack of proper awareness make financial inclusion important at the same time difficult in India. This necessitates the delivery of financial inclusion as a big project with coordinated efforts by the government, regulators like RBI, financial institutions, especially commercial banks, technology players like NPCIL, private sector entities and society as well.

Financial inclusion measures are now integrated into the national development strategy. For example, India's JDY and the DBT are classic examples of government action to enhance welfare by utilising the medium of financial inclusion.

To realise financial inclusion, first financial exclusion levels are to be measured – the degree of bank penetration in terms of bank accounts, and accessibility to other financial products and services like pension and insurance. Similarly, hurdles for financial

inclusion are to be identified, targets for financial inclusion are to be set, multi-step multi-institutional action plans are to be designed, and accessory supports like financial literacy and digital literacy efforts are to be made to include the excluded.

In the same manner, financial infrastructure is to be modified and networks (bank branches etc.) are to be built to enhance the reach towards the poor. Similarly, technological advancements in the field of payments etc. are to be adapted to realise the financial inclusion target efficiently and cost-effectively.

Financial Inclusion Initiatives

Financial inclusion measures launched in India cover a large number of measures, including the provision of bank accounts, use of technology, appointment of BCs, expansion of branch networks etc. Several institutions supported by the government and the RBI are engaged in financial inclusion drives.

The important financial inclusion efforts launched in India are the Basic Savings Bank Deposit Account (BSBDA), and the Financial Inclusion Plan (FIP) for the expansion of branch and branchless banking. Pradhan Mantri Jan Dhan Yojana, Adoption of Business Correspondents (BCs), promotion of technology for banking and payment like UPI, NEFT, IMPS, AEPS, RuPay debit cards, Financial Literacy Programme, Kisan Credit Cards (KCC), Bank -SHG linkage programme, Aadhaar based payment infrastructure etc.

Besides these initiatives, several conventional schemes like the promotion of microfinance, social sector programmes etc, added strength to the financial inclusion programmes. A major feature of the financial inclusion measures in India is that they are accompanied by financial literacy programmes. Overall, the diversity of the programmes on several fronts helped the country to achieve the objectives of financial inclusion quickly time. Most impressive is that the weaker sections of the people are now able to handle their bank accounts and payments without depending on others. Even a higher proportion of the elderly and people with low financial skills are now able to engage in digital payments without much difficulty.

Central bank digital currency (CBDC)

Subin S., Faculty Member, CSIP

Central bank digital currency (CBDC) is a digital form of fiat currency that is issued and backed by a central bank. Unlike cryptocurrencies such as Bitcoin, which are decentralized and not backed by any government or central authority, CBDCs are issued and managed by a central authority.

CBDCs are designed to be used as a form of payment and can be stored in digital wallets or other electronic devices. They can be transferred between individuals or institutions using digital payment systems, just like traditional fiat currencies. However, because they are digital, CBDCs can be transferred instantly and securely, with no need for intermediaries such as banks or payment processors.There are several different types of CBDCs, each with its unique features and characteristics. For example, a retail CBDC is designed for use by individuals and households and can be used to make everyday purchases. A wholesale CBDC, on the other hand, is designed for use by financial institutions and can be used to facilitate large-value transactions between banks or other financial institutions.

CBDCs have several potential benefits. For example, they can improve the efficiency of payment systems by reducing the need for intermediaries, such as banks or payment processors. They can also provide greater financial inclusion by making it easier for individuals who do not have access to traditional banking services to participate in the financial system.CBDCs can also help central banks to monitor and regulate the economy more effectively. Because CBDC transactions are recorded on a blockchain or other distributed ledger, they can be easily tracked and monitored. This can help central banks to identify trends and respond to changes in the economy more quickly and effectively.

However, there are also some potential drawbacks to CBDCs. For example, they could pose a risk to financial stability if they are not implemented carefully. They could also lead to greater

financial surveillance and privacy concerns if they are not designed with sufficient privacy protections.Overall, CBDCs represents an important development in the evolution of digital payments and the global financial system. While there are still many questions to be answered about how CBDCs will be implemented and regulated, they have the potential to transform the way we think about money and financial transactions in the digital age.One potential benefit of CBDCs is that they could help to reduce the cost and complexity of cross-border payments. Because CBDCs are digital, they can be easily transferred across borders without the need for intermediaries such as banks or payment processors. This could make it easier and less expensive for individuals and businesses to conduct international transactions.

Another potential benefit of CBDCs is that they could help to reduce the risk of financial fraud and money laundering. Because CBDC transactions are recorded on a blockchain or other distributed ledger, they are transparent and traceable. This could make it more difficult for criminals to engage in illegal activities such as money laundering or terrorism financing.CBDCs could also help to reduce the risk of bank runs and other financial crises. Because CBDCs are backed by a central bank, they are considered to be a safe and reliable form of money. This could help to reduce the risk of bank runs and other financial crises, as individuals and institutions would have greater confidence in the stability of the financial system.

However, there are also some potential drawbacks to CBDCs. For example, they could pose a risk to financial privacy if they are not designed with sufficient privacy protections. Because CBDC transactions are recorded on a blockchain or other distributed ledger, they could potentially be accessed by government authorities or other third parties. CBDCs could also lead to greater financial surveillance if they are not implemented carefully. Because CBDC transactions are easily trackable, they could be used to monitor the financial activities of individuals and institutions. This could potentially lead to greater government

control over financial transactions and could raise concerns about privacy and civil liberties.Overall, CBDCs represents an important development in the evolution of digital payments and the global financial system. While there are still many questions to be answered about how CBDCs will be implemented and regulated, they have the potential to transform the way we think about money and financial transactions in the digital age.Another potential benefit of CBDCs is that they could help to increase financial inclusion, particularly in developing countries where access to traditional banking services is limited. Because CBDCs can be stored and transferred using digital wallets or other electronic devices, individuals who do not have access to traditional bank accounts could still participate in the financial system. This could help to reduce poverty and increase economic growth in these countries.

CBDCs could also help to reduce the reliance on cash, which can be expensive and difficult to manage. Cash transactions can be costly for governments and businesses to process, and they can also be more vulnerable to theft and fraud. CBDCs could provide a more secure and efficient alternative to cash, making it easier and less expensive for governments and businesses to manage their financial transactions.CBDCs could also help to reduce the risk of financial instability caused by a sudden loss of confidence in the banking system. In times of financial crisis, individuals and institutions may rush to withdraw their funds from banks, leading to a bank run and potentially causing a financial collapse. With CBDCs, individuals and institutions would have an alternative, more stable form of money that is backed by the central bank. This could help to reduce the risk of bank runs and other financial crises.

However, implementing CBDCs could also pose significant challenges. For example, CBDCs would need to be designed and implemented in a way that ensures they are secure, efficient, and accessible to all members of society. CBDCs could also pose a threat to the business models of commercial banks, which may need to adapt to the new digital payment environment.In

addition, CBDCs could also have implications for monetary policy and financial regulation. CBDCs could potentially enable central banks to implement more effective monetary policy by directly controlling the money supply, but they could also lead to greater financial surveillance and government control over financial transactions.

Overall, CBDCs represents an important development in the evolution of digital payments and the global financial system. While there are many potential benefits and challenges associated with CBDCs, they have the potential to transform the way we think about money and financial transactions in the digital age. It remains to be seen how CBDCs will be implemented and regulated, but they are likely to have a significant impact on the global financial landscape in the coming years. One potential challenge associated with the implementation of CBDCs is the potential impact on the banking sector. CBDCs could potentially undermine the role of commercial banks by providing a direct alternative to bank deposits. If individuals and institutions begin to rely on CBDCs rather than bank deposits, this could potentially reduce the amount of funding available to banks and lead to a decline in their profitability. Another potential challenge is the potential impact on financial stability. If CBDCs are not designed and implemented carefully, they could potentially exacerbate existing financial vulnerabilities or create new ones. For example, if individuals and institutions begin to withdraw funds from commercial banks in favour of CBDCs, this could potentially lead to a liquidity crunch or a bank run.There are also potential technical challenges associated with the implementation of CBDCs. For example, CBDCs would need to be designed in a way that ensures they are secure, scalable, and interoperable with existing payment systems. This could require significant investment in new technologies and infrastructure. Furthermore, there are potential legal and regulatory challenges associated with the implementation of CBDCs. For example, the regulatory framework for CBDCs would need to be established, and issues such as data

privacy, cybersecurity, and consumer protection would need to be addressed.

In addition, there are potential geopolitical implications associated with the implementation of CBDCs. If CBDCs become widely adopted, they could potentially shift the balance of economic power away from the US dollar and other traditional reserve currencies. This could have significant implications for global economic governance and international relations. Overall, while CBDCs have the potential to offer a range of benefits, they also pose significant challenges and risks that will need to be carefully managed. The implementation of CBDCs will require collaboration and coordination among central banks, governments, financial institutions, and technology providers. As such, the development of CBDCs is likely to be a complex and evolving process that will require ongoing attention and adaptation. ∎

India and its Small Neighbours: A Discussion on Recent Economic Crisis

Dr. Shiby M. Thomas
Head, PG & Research Department of Economics,
St. Joseph's College Devagiri (Autonomous), Kozhikode

The Economic condition of different countries of the world is a topic of heated debate, especially after the breaking down of the Covid pandemic and the Russia-Ukraine Conflict. The recent economic breakdown of our neighbours like Sri Lanka, Pakistan, Nepal, and Bangladesh is a cause of concern not only for India but also for the whole world. The essay contains a comparative discussion of the current economic situation of India and its small neighbouring countries, while the large neighbour China is leftout of the discussion here.

An overview of the crisis

The political turmoil along with the financial mismanagement created a crisis in the post-pandemic era in our neighbourhood. The inflation in these countries continues to remain at double-digit with Sri Lank being the worst hit with more than fifty percent. All these countries are in a debt trap and the foreign exchange reserves are rapidly declining. International agencies are not willing to provide loans because of their default in loan repayment. Faulty agricultural policies decrease agricultural production. The trade gap is an alarming situation. Shortage of fuel, electricity and food supply went to disastrous proportions. In some of the countries, people were in queues to get essential commodities similar to the situation at the disintegration of the USSR. In SriLanka people were in the streets and siege the residence of the president demanding their resignation. The protesters roamed around even in the bedrooms of the presidential palace. In other countries also protest was there but not on such a large scale as that of Sri Lanka.

The crisis in Sri Lanka

Sri Lanka is a small island nation in South East Asia. It has the 120th position in the world in terms of land area and has a population of more than 2 crores. The civil war during the previous decades ruined the economy too much. After the civil war, the economy has been trying to recover especially through its burgeoning service sector contributed by the expanding tourism industry.But some recent happenings landed the country in a situation of the worst economic crisis the country has ever faced in the last 73 years. The crisis has been caused by several reasons, according to experts. The 2019 Easter Bombings, Covid 19 pandemic, the foreign exchange crisis, money printing by the central bank, the intervention of China and its debt trap diplomacy are some of them. Agriculture and food production suffered due to the anti-chemical fertilizer bill passed by govt without any farsightedness. The Russia-Ukraine war badly affected the economy considerably as the country must depend on imports for essential commodities and fuel. In June 2022, the then Prime Minister said in Parliament that the economy had collapsed leaving it unable to pay for the essentials.

But now the country is slowly recovering from the crisis. The inflation dips and the tourist sector again gain strength from the arrival of tourists. It may take a long time for the country to attain the condition of full recovery from the economic ailments that affected the nation.

The Crisis in Pakistan and Nepal

Pakistan also faced a similar problem in the year 2022. The political situation was not supportive of the smooth sailing of the economy. The debt burden was very far beyond thereasonable limits of the percentage of GDP. The ADB projected onlya 4% growth rate of GDP this year. The inflation rate was 21.3% in June 2022. There have been shortages of fuel and other essential commodities. Moreover, the country has been badly hit by the elements of terrorism and political violence.

Covid pandemic and its repercussions badly affected the tourism industry of Nepal, which has beenits goldengoose. The foreign remittance decreases. This paved the signs of a similar crisis in Nepal as in other nations. In Nepal democracy is in its infancy which further contributed to the economic woes of this tiny Himalayan Nation. In neighbouring countries like Bangladesh,Myanmar,and Bhutan also,the economic conditions are fragile, the reasons are common withthat of other South Asian Countries and some of them are country specific.

India and the recent economic crisis

Being the largest nation in South Asia and the largest democracy in the world, India's economic position is in no way comparable to other neighbouring small countries. With its vast economic resources and manpower, India can stand alone among this group of nations. The economic base provided by the five-year plans during the period after independence provided strong pillars for India's economic growth. The bank nationalisation and various poverty eradication programmes created the ground for future holistic economic development.

India overcame the balance payment crisis in the latter part of the 1990s by adopting the New Economic Policies in 1991. The reform policies in various sectors created a dynamic boost to investment, economic efficiency, output growth, skill formation and other economic variables that contributed to sustained economic growth.

The resilience of the Indian Economy

Many agencies have projected that the Indian economy maybe one of the fastest-growing economies in the world. India has a lower debt position compared to the rest of the world. The share of the working population in India is high compared to other countries. Access to the necessities increased in India.More than 80% of people now turn to digital banking. The central bank has more autonomy compared to other South Asian nations in terms of discretionary monetary policy. The political stability coupled with supportive governments at the centre and states makes India

a haven for investors both domestic and foreign.

Negative factors are many, but the historical and inherent adaptability of the Indian economy in difficult situations make the Indian Economy at a high stature even though our small neighbours are struggling especially after the pandemic. India as a strong neighbour is providing the necessary support to these countries to overcome the difficulties.

■

Effects of Russian Ukraine War on India

Dr. Sijo K. Manuel

Dept. of Political Science, St. Thomas College, Palai

In all areas of collaboration, India and Ukraine have a close bilateral relationship. One of the first nations to recognise Ukraine was India. In December 1991, the Indian government recognised the Ukrainian Republic as a sovereign nation, and in January 1992, diplomatic ties were established. In May 1992, the Indian Embassy in Kiev first opened its doors. In February 1993, the first in Asia, Ukraine established its Mission in Delhi.

The two nations' bilateral commerce increased dramatically over the past 25 years, reaching over US\$ 2.8 billion in 2018–19. India is Ukraine's top export market in the Asia-Pacific region and its fifth-largest export market overall. Agriculture, metallurgy, plastics, and polymers are the main items of export from Ukraine to India whereas pharmaceuticals, machinery, chemicals, food products, etc. are the major Indian exports to Ukraine.

In Ukraine, there is a significant popular interest in Indian culture, including dances, yoga, philosophy, Ayurveda, and spirituality. More than 30 Ukrainian cultural organizations/associations operate all around the nation and are dedicated to promoting Indian art forms, particularly Indian dance. The majority of groups have picked up Indian dances on their own and are spreading awareness of them through festivals and teaching dance.

The conflict between Russia and Ukraine

The bilateral relations between the successor states have seen periods of ties, tensions, and outright hostility since the fall of the Soviet Union in 1991. Early in the 1990s, Ukraine's foreign policy was primarily focused on securing its sovereignty and independence, and it was balanced in its collaboration with the European Union (EU), Russia, and other strong policies. After the 2014 Ukrainian Revolution, which was followed by Russia's

annexation of Crimea from Ukraine, and the Donbas War, in which Russia backed the separatist rebels of the Donetsk People's Republic and the Luhansk People's Republic, relations between the two nations deteriorated. The conflicts had killed more than 13,000 people by early 2020 and brought Western sanctions on Russia. Numerous bilateral agreements have been terminated and economic ties severed.

There are various reasons behind the conflict between Russia and Ukraine. One among them is that Russia has long resisted Ukraine's move toward European institutions and Russia insists that Ukraine never joins NATO, a demand rejected by the Western alliance. Because NATO is a military alliance made up of 30 countries including the UK and the US. Another reason is that Russia seized part of southern Ukraine in 2014 and backed separatists who started a conflict in large areas of the east. Russia warned Ukraine with military measures for a long if the West did not meet its demands. The non-acceptance of Russia's demand by the West has now created a pretext to invade Ukraine. If Ukraine joins hands with the USA and the Allies, it's a threat to Russia.

Russia's Stand

Russia is demanding a swift, point-by-point response to its demands, the main demand of which is to stop NATO's expansion any further to the east. For Russia, it's mandatory to ensure that Ukraine never, ever becomes a member of NATO. Moscow has accused the NATO countries of 'pumping' Ukraine with weapons and the US of stoking tensions. Russia also wants NATO to abandon military activity in Eastern Europe, which would mean pulling out its combat units from Poland and the Baltic republics of Estonia, Latvia, and Lithuania, and not deploying missiles in countries such as Poland and Romania. In short, it wants NATO to return to its pre-1997 borders.

Russia has also proposed a treaty with the US barring nuclear weapons from being deployed beyond their national territories. In addition, these moves can be seen indirectly as a move by

Russia to revive the erstwhile USSR. After the Second World War, Russia re-established its control over the Rimland in Eastern Europe and Central Asia, which it hoped would protect its heartland. But the disintegration of the Soviet Union threw its security calculations into disarray, deepening its historical insecurity. Russia is also frustrated that the 2015 Minsk peace deal for eastern Ukraine is far from being fulfilled. There are still no arrangements for independently monitored elections in the separatist regions. Russia denies accusations that it is part of the lingering conflict.

Ukraine's stand

Ukraine is very strong in its stand to join NATO which it considers a safety measure for its people from foreign invasion. Since the USA stands as a strong enemy of Russia, it fears the consequence of being attacked by the USA at any time. Ukraine had banned its people of the age group of 18 to 60 from cross-border travel and had supplied 10000 guns to the public to defend themselves. NATO kept a vigilant observation of the affairs closely and had agreed to supply weapons to the war site for Ukraine.

Effects on India

Since the invasion, a once-in-a-century occurrence, Russians have become the most hated nation in the world. India has opted to remain neutral in the dispute between the United States and Russia because it would be damaging to the country to take a side.

Some purchases have been delayed as a result of international restrictions. Russia supplies a significant share of India's total energy consumption, which is 80% dependent on the global market. India pays Russia through the State Bank of India for security concerns and to abide by US and EU sanctions (SBI). SBI, meanwhile, has already made it clear that it would not handle payments for Russia. This development will provide considerable difficulties for Indian oil producers in the future. Also noteworthy is the threat of the US Countering America's Adversaries through Sanctions Act (CAATSA) sanctions against India, which would

impose sanctions on any country that purchases major defence hardware from Russia, including the S-400 missile defence system, which is currently in operation.

A major increase in inflation would be experienced in India as a result of increased crude oil prices. Every time the price of crude oil rises, the price of edible oil follows suit, which has a detrimental effect on the economy as a whole. To control inflation, the Reverse Bank of India anticipates raising the interest rate by 90 to 100 basis points shortly. The cost of borrowing will go up, which will have a detrimental impact on the economy's expansion. The global electronic industry has already been significantly impacted by the chips crisis, which is already felt all around the world. Sanctions on Russia will only make the issue worse because of how heavily it is involved in this sector. The cost of electronic goods will rise if the global economy keeps contracting and global supply networks are further strained. Indian homes will be substantially impacted by this.

Metals, which make up a major part of our daily, have also been major impacted by this war as most of the metals are either produced or refined in Russia or Ukraine, which is also witnessing a great price hike globally. That has resulted in a significant drop in operating profits for the auto industry, as well as an expected rise in prices in the coming quarters. Adding insult to injury is the fact that travel costs are expected to rise shortly, making the situation even more difficult. If the price of crude oil continues to rise, airlines are preparing to raise ticket prices because it is hurting operating costs. Pharmaceutical companies will be forced to raise prices as a result of the Russian invasion in the days ahead. Considering that the pandemic is still raging, this could lead to the collapse of the Indian family unit.

With the multiple restrictions imposed on Russia at the moment and the fact that Russia is a close partner of India, India must exercise caution. Although India may be internally playing it safe, sanctions will significantly affect both the economy and India's national security in the long run. Notwithstanding all of its difficulties, India stands to gain immensely from the current

situation. Everyone on earth is responsible for the killings of Ukrainians.

India's Strategy so far

India's balanced approach: India has good reason to be pleased that the public conversation in the West now more accurately reflects its viewpoint on Ukraine. The Indian responses to the problem have been under constant fire from the Western media and think groups in recent months for being lacking in moral clarity and strategic coherence in the face of Russia's unwarranted aggression.

India didn't criticize Russian nor endorse Russian aggression: Delhi has resisted outright condemning Russia's assault against Ukraine for the past nine months and has urged negotiations between the warring parties. At the same time, India refrained from supporting Russian aggression, emphasized the need to uphold the UN Charter, emphasized the inviolability of territorial sovereignty, cautioned against the use of nuclear weapons, and attempted to raise awareness of the negative economic effects of the conflict on the "Global South."

America showed sensitivity to India's position: There was some awareness of Delhi's perspective during the Biden administration, as well as India's long-standing equity in its interactions with Russia and the limitations it faced. Official Washington never allowed the intensity of the European Ukrainian crisis to override America's longer-term desire to work with India to maintain stability in the Indo-Pacific. While this cannot be true of Europe, the continent was nonetheless directly embroiled in the most serious battle to occur since the Second World War. A broken peace has caused real anguish in Europe.

India's role in grain shipment and nuclear power station: According to recent reports in US media, India provided diplomatic support during a few pivotal moments of the nine-month conflict, assisting in resolving disagreements over a grain shipment agreement from Ukraine and lowering the risks of a war aimed at the nuclear power plant in eastern Ukraine at Zaporizhzhia. ■

The Patent System in India

Prof. (Dr.) Ison V. Vanchipurackal
Principal, Kuriakose Elias College, Mannanam

Intellectual property refers to the intellectual competence possessed by someone. Intellectual property rights are statutory rights that allow an inventor or the creator of a property to exclude others from using the same commercially for a specified period. The property right allows the creator to have benefited from work from a commercial point of view. Intellectual property can be a patent, a trademark, an industrial design, a copyright, etc. In India, the general laws governing intellectual property rights mainlyinclude the patent act-1970, patents rules 2005, trademark act-1999, copyright act-1957, design act-2000, etc. In this article, we discuss briefly the patent filing procedure in our country.

A patent is a contract between an inventor and a country that excludes others from marketing, selling, or using the invention without prior permission from the inventor. If an investor does not get a patent right over an invention, it can be explored by anybody commercially. By definition, an invention is a novel and innovative product involving an inventive step, capable of industrial application. The novelty of the invention refers to the fact that it is not known/not disclosed to the public at the time a patent application was made. If an inventor considers the invention novel and is confident about its inventiveness, a patent application can be made. A thorough patent search is required before a patent application is filed. An invention need not always be a new product; it can be an improvement to an existing product, provided there is an innovation. Inventions not involving a manufacturing step are not considered for patenting.

There exists no global patenting system; a separate patent must be obtained in each country. There exists an international treaty called the patent co-operation treaty (PCT) which provides the facility to applicants to file a single patent application and

designate the countries in which the property rights are to be protected. India is a member of the patent cooperation treaty. PCT can provide an international filing date. Indian patents protect inventions filed in India only. In India, the patent head office is in Kolkata. There are regional branch offices in Chennai, Mumbai, and New Delhi. The jurisdiction of each office is different. An application for granting a patent can be filed by the first inventor or a legal representative of the first inventor. When an application is filed, the date of application is recorded by the patent office which is called the priority date. The priority date in one county is respected in other countries, provided a similar application is filed in the desired countries within twelve months from the date of application.

The patent application must contain some necessary documents which are included in forms 1, 2, 3, and 5. Form 1 is the application for granting a patent. It requires the title of the invention and the details of the inventors. Form 2 contains the patent specification, which discloses the details of the invention. The patent specification can be of two kinds; provisional and complete. Provisional specifications are submitted when some experimentation is required to perfect the invention. The specification should contain an abstract, field of the invention, description of the prior art or the background of the invention specifying the drawbacks in the state of art, a detailed description of the invention with drawings labeled, and claims of the invention. The provisional application ensures an early priority date, and it need not contain claims and complete details of the invention. The priority date is the date of provisional application submission. But a complete specification has to be filed in twelve months. Form 3 contains a statement and undertaking of the inventor that it is not filed outside the country and form 5 contains the declaration of the inventorship. A power of attorney in form 26 is to be submitted in case a patent agent is assigned in the process.

At the time of the complete specification submission or within forty-eight months from the date of its submission, a

request for examining the patent application has to be made in form 18. After the examination of the patent application by a patent examiner, a first examination report, containing objections raised by the examiner, narrowing the scope of the invention or challenging its inventiveness, if any, will be communicated to the applicant. The applicant has to respond to the report in twelve months. If the applicant fails to do so, the application is considered withdrawn. Otherwise, if the applicant is successful in providing proper justification for the claims or suitable amendments are done, the application is published in the patent gazette issued by the patent office. The published article is now open for objections from the public and if there is no objection the patent will be granted. A patent is granted for a period of twenty years from the priority date. But, it has to be maintained by paying an annual renewal fee.

Patents become worth only when their commercial benefit is demonstrated to the stakeholders so that the rewards become substantial. They are of no practical use unless not marketed. A complete commercialization strategy considering the technical, commercial, and legal aspects of the invention decides the success ratio of the patent. Those who do academic research, on fabricating or inventing a product having some commercial value, should delay its publication in research journals until a patent application is filed. Once the patent application is filed, it can be communicated for publication.

75 Years of India's Science and Technology Journey

Dr. G.D. Gem Mathew

(Former Associate Professor, Science Writer and
Associate Editor, *Sastrapadham* Science Magazine)

India, being the cradle of one of the oldest civilisations of the world, has had an ancient scientific legacy spanning fields such as astronomy, mathematics,medicine, surgery, and metallurgy. After years of being under foreign rule, it was this embedded scientific spirit and technological acumen of India's scientists, technologists, science administrators and policymakers that helped the country catapult itself to becoming a world scientific power to reckon with soon after it gained independence in 1947.

At the time of Independence, India inherited a shattered economy with no worthwhile infrastructure for the development of science and technology, no sound industrial base, abysmally low agricultural production, and almost non-existent health services. The literacy rate was around 12% and the average life expectancy was about 32 years. Famines were chronic. Imported food grains fed the people. The country led to a "ship-to-mouth" existence.

However, today as we celebrate *Azadi ka Amrit Mahotsav* - 75 years of the country's independence, we look back with pride at the innumerable occasions when India's scientists innovated, devised ingenious processes, and came up with practical solutions for the industry on one side and the country's rural and remote areas on the other side of the spectrum. India now gears up to provide and deploy high-tech solutions in several key areas such as education, healthcare, and transport to all citizens, reaching even the most marginalised communities.

From a newly independent country learning to govern itself to a nation with the capability of developing and launching rockets, India has come a long way. Indian science and technology

have had a major role in this feat.

Science and Technology (S&T) in Independent India

Travelling back in time along the eventful lane of India's S&T ecosystem, several milestones that directed our nation to the significant global position that we are in today flash into the mind. The stalwarts who stand out include Pandit Jawaharlal Nehru, the first PM of India, who said "Scientific institutions are the temples of modern India and play a key role in the gigantic task of national development and nation building". He initiated several reforms in higher education and science and technology and was particularly instrumental in setting up the Indian Institutes of Technology (IITs). The first one was inaugurated on 18 August 1951 at Kharagpur by India's then Minister of Education, Maulana Abul Kalam Azad.

India propelled herself into the domain of space right from the 1960s and through diplomatic ties with the Soviet Union planted the seed of the Indian Space Research Organisation, simultaneously advancing nuclear capability which was jubilantly demonstrated through the first nuclear test explosion on 18 May 1974 at Pokhran.

All along the past 75 years, India held on to S&T as the magic wand that transformed an economically beleaguered country, handed over to Indians from the shackles of the British to the world leader that we are today. India's S&T journey has been no less than a rollercoaster ride, and the real drivers of India's S&T ecosystem have been the four well-paced National Science Policies.

Science Policies Propelling India's S&T Growth

The *Scientific Policy Resolution (SPR) of 1958* looked upon 'science as a key to national prosperity'.It emphasized the Government's responsibility to foster, promote and sustain, by all appropriate means, the cultivation of science and scientific research in all its aspects pure, applied and educational. The policy also envisaged the need to train adequate science and technology

personnel. The SPR captured the vision of India as a welfare state and largely emphasised basic research in almost every field of science. It was instrumental in building and nourishing the science ecosystem in India through science education and research. It provided the required directions to set up organisations like the Defence Research and Development Organization (DRDO-1958), the Department of Electronics (DOE-1971), the Department of Science & Technology (DST-1971), the Department of Space (DOS-1972), and the Department of Environment (DOE-1980). It fostered the creation of the basic infrastructure needed to build the foundation of India's scientific research, critical human capital and R&D capacities.

By the 1980s, India could boast of some strong science and agriculture-based qualified professionals and strategic technological platforms. India's agronomy got a major thrust during the green revolution (food grains, especially wheat and rice) of the sixties, the white revolution (milk and dairy products) of the seventies, the yellow revolution (edible oil seeds) of the eighties, and the golden revolution (honey and horticulture) of the nineties when India started becoming self-sufficient in agricultural produce, particularly food grains.

The **Technology Policy Statement (TPS) of 1983** aimed 'to develop indigenous technology and ensure efficient adoption of imported technologies appropriate to national priorities and availability of resources. It mainly focused on achieving technological competence and self-reliance by nurturing indigenous technologies and reducing the dependence on imports in critical areas. The policy also aimed at strengthening the technology base, especially in trending sectors of that time including information technology, electronics, and biotechnology. Increased R&D investments and collaboration among governmental organisations, educational institutions and industries were guided by this policy. Technology Development Fund (TDB) was established to provide financial assistance to Indian industries. Technology Information Forecasting and Assessment Council (TIFAC) was established for continuous and

systematic forecasting and assessment studies of emerging technologies. In the following two decades, India took massive strides towards progress by opening the economy through liberalisation, privatisation, and globalisation.

The *Science and Technology Policy (STP) of 2003* aimed 'to build a new and resurgent India ensuring that S & T truly uplift the Indian people and indeed all humanity', by upgrading the research and academic infrastructures, building a connection with the economy and society at large. It focused on the investment required for research and development (a target of 2% of GDP), a collaboration between industry and research institutions, and the establishment of intellectual rights regimes to protect and incentivise inventors. With the rapid advancement of communication technologies, new issues related to cyber security and ethics, such as privacy consideration and inequity came to light. Mechanisms to address such unforeseen issues were also considered in this policy. This helped India grow her S&T investments. R&D spending touched a significant percentage of GDP (0.7%), though way behind the targeted 2%. Research outputs such as publications, numbers of PhD students, and patent filing from the research and innovation also increased significantly. Sixteen new IITs (2004 onwards) were established taking their total number to 23. In addition, new institutes like the Indian Institutes of Science Education and Research (IISERs - 2006 onwards) came into being. Thus, Science, Technology, and Innovation (STI) became the major drivers of national development, and the socioeconomic benefits of S&T were firmly established.

The *Science, Technology, and Innovation Policy (STIP) of 2013* laid emphasis on creating a robust environment for enhanced private sector participation in R&D and enthused new vigour to establish a PPP framework. It encouraged participation in S&T-based high-risk innovations due to which India increased her participation in global mega-science projects, including the Laser Interferometer Gravitational-Wave Observatory (LIGO), the Large Hadron Collider (LHC - CERN), the International Thermonuclear

Experimental Reactor (ITER) and the Square Kilometre Array (SKA).

The Indian 'Decade of Innovation', launched in 2010 made 'Innovation' a buzzword. Post-2014, the Government of India streamlined its efforts with new vigour by launching several flagship initiatives to support and stimulate R&D culture among students and young researchers including Make in India, Atal Innovation Mission (AIM), Start-Up India, Stand-Up India, Fund of Funds for Start-ups (FFS), Pradhan Mantri MUDRA Yojana (PMMY), E-Business portal, the introduction of the Patent Box Regime, Regulatory Sandbox and tax sops including removal of Angel tax, etc. Such proactive steps and innovation strategies have enabled India to develop a robust manufacturing and service sector while simultaneously ensuring a sound R&D ecosystem with skilled manpower giving rich dividends in terms of global rankings, particularly in the Global Innovation Index where India stands 48th and is the third most innovative lower-middle-income economy in the world.

Recent Major Developments in Science, Technology, and Innovation (STI)

During the past 6-7 years, India has added several feathers to her cap. A particular note may be made of India's Gross Expenditure on R&D (GERD) which nearly tripled during the period from 2007-08 to 2017-18 and per capita, R&D expenditure increased 1.5 times. Another commendable improvement is in the participation of women in extramural R&D projects which increased from 13% in 2000-01 to 24% in 2016-17. India is ranked 3rd in terms of the number of PhDs awarded in Science and Engineering (S&E) after the USA and China,and 3rd in global scientific publications as per the National Science Foundation (NSF), USA. According to the World Intellectual Property Organisation (WIPO), India's Patent Office stands 7th among the top 10 Patent Filing Offices in the world and 9th for Resident Patent Filing.

Some of India's biggest milestones have been in space exploration pioneered by Dr Vikram A. Sarabhai who would say,

"It is not the question of whether India can afford to invest in space research but whether she can afford not to invest in it". Despite technology denials at various points in time, the Indian space programme has notched up enviable successes placing it among the top space programmes in the world. India's achievements in space have skyrocketed from the successful launch of India's first satellite *Aryabhata* in 1975 to the Mars Orbiter Mission (MOM) or *Mangalyaan* in 2013 followed by the *Chandrayaan* programme and the most awaited manned *Gaganyaan* mission. These achievements speak volumes about exceptional scientistslike Dr APJ Abdul Kalam who have left an indelible mark in the sands of time.

In the nuclear arena, India exploded the country's first nuclear test *Operation Smiling Buddha* in 1974 and there has been no looking back ever since in exploring nuclear energy for peaceful purposes. Besides power generation, India's nuclear research programme includes the use of radioisotopes in agriculture, medicine, and industry.

In drug manufacturing, India through her generic lifesaving drugs has become 'the pharmacy of the world' in supplying affordable medicines. India is now the largest provider of generic drugs globally, accounting for 20% of global exports in terms of volume. Over 80% of antiretroviral drugs used globally to combat AIDS come from Indian pharmaceutical firms.

India has made her presence felt from the South pole to the North pole, starting with the Indian Antarctic Programme launched in 1981 and several subsequent missions to *Dakshin Gangotri*, *Maitri and Bharati*. India's permanent Arctic research station *Himadri* was set up in 2008 at Ny Alesund, Spitsbergen Island (also known as Svalbard), Norway, and India's first multi-sensor underwater moored observatory in the Arctic region *IndARC* was deployed in 2014 at Knogsfjorden fjord, Svalbard, which is halfway between Norway and the North Pole. Its research goal is to study the Arctic climate process and its influence on the Indian monsoon system.

Today, India is actively engaged in emerging technologies

such as Nanotechnology, Artificial Intelligence, Robotics, Augmented and Virtual Reality, the Internet of Things and so on.

Conclusion

India's journey from 1947 to today is remarkable. No society, as large as India and as diverse as India in known history, has transformed itself in just two human generations (60 years). What made the remarkable transformation possible was the application of science and technology in building the nation which resulted in self-sufficiencyin food production and better healthcare for morethan 1 billion people. It also gave birth to a whole generation of self-confident Indians who took up adventurous career paths in India and abroad, paving the way for the country's contribution to academics, basic science, information technology, the pharmaceutical industry, space research and other sectors worldwide.

As the COVID-19 pandemic forced the world to realign in terms of various sectors, the Indian scientific ecosystem is gearing up to receive yet another path breaking national Science, Technology, and Innovation Policy (STIP) shortly. The draft of the new Science, Technology, and Innovation Policy aims to bring about profound changes through short-term, medium-term, and long-term mission mode projects by building a nurtured ecosystem that promotes research and innovation on the part of both individuals and organizations. It aims to foster, develop, and nurture a robust system for evidence and stakeholder-driven STI planning, information, evaluation, and policy research in India. The objective of the policy is to identify and address the strengths and weaknesses of the Indian STI ecosystem to catalyse the socioeconomic development of the country and make the Indian STI ecosystem globally competitive.

The clarion call by our Hon'ble Prime Minister to build an *Atmanirbhar Bharat* further emphasises how essential technology indigenisation is for us to be truly free and independent. Self-reliance in S&T is indeed the way forward for India to ensure a hassle-free journey ahead.

ChatGPT: A Double-edged Sword

Shahin Basheer, Mentor, CSIP

ChatGPT is an AI-powered chatbot that uses a state-of-the-art natural language processing (NLP) technology called GPT (Generative Pre-trained Transformer) to engage in conversations with humans. This technology has been trained on a vast corpus of text data to learn the nuances of human language, enabling it to understand the meaning of words and sentences, generate responses, and even learn from previous interactions to improve future responses.

PT is a type of neural network that is specifically designed for natural language processing tasks. It consists of multiple layers of inter-connected nodes that perform complex operations on text data to extract meaning and generate responses. The network is pre-trained on a massive dataset of text, such as the entirety of Wikipedia or the Common Crawl web corpus, to develop a deep understanding of language. Once trained, the GPT model can be fine-tuned on specific tasks, such as chatbot conversations, by providing it with additional training data that is relevant to the task at hand. During this fine-tuning process, the model adapts its weights and biases to better understand the nuances of the language and generate more accurate and relevant responses.

ChatGPT is an example of a conversational AI, which is a type of artificial intelligence that is designed to simulate human conversation. Conversational AI can be used in a variety of applications, including customer service, personal assistants, and social chatbots. In each of these applications, the goal is to create an experience that feels natural and engaging for the user. To create a convincing conversation, ChatGPT uses a range of NLP techniques, including natural language understanding (NLU) and natural language generation (NLG). NLU involves processing the user's input to understand the meaning behind the words and

the intent behind the message. NLG involves generating a response that is relevant, accurate, and natural-sounding.

One of the key advantages of ChatGPT is its ability to learn from previous conversations. By analysing the user's input and the model's output, ChatGPT can identify patterns and improve its performance over time. This is known as machine learning, and it is a core component of artificial intelligence. ChatGPT is also designed to be highly customizable, which allows developers to create chatbots that are tailored to specific use cases. For example, a customer service chatbot might be designed to handle inquiries related to a specific product or service, while a personal assistant chatbot might be designed to help users manage their schedules and tasks.

Overall, ChatGPT represents a major advance in the field of natural language processing and artificial intelligence. By enabling computers to understand and generate human-like language, chatbots like ChatGPT are opening up new opportunities for businesses and individuals alike. As this technology continues to evolve, we can expect to see even more sophisticated and intelligent chatbots in the future.

ChatGPT is built on top of the GPT architecture, which was first introduced by Open AI in 2018. The GPT architecture is a type of transformer neural network, which has been shown to be highly effective for natural language processing tasks such as language modeling, text classification, and machine translation.The GPT architecture uses a technique called self-attention to learn the relationships between different words in a sentence. Self-attention allows the model to focus on different parts of the input text and identify the most important information for generating a response.

In the case of ChatGPT, the model is fine-tuned on a large corpus of conversational data to learn how to generate responses that are relevant, accurate, and natural-sounding. This requires the model to understand not only the individual words in a sentence but also the overall context and intent of the message.

To ensure that ChatGPT can handle a wide range of input messages, the model is trained on a diverse set of conversational data. This includes text from social media, customer service chats, and other sources that reflect the wide variety of ways in which people use language to communicate.

Once the model is trained, it can be integrated into a chatbot framework that handles user interactions, manages the conversation flow, and presents the responses generated by ChatGPT. The chatbot framework can also incorporate other AI technologies, such as speech recognition and natural language understanding, to create a seamless and intuitive user experience.

ChatGPT is not limited to text-based conversations. It can also be used to generate spoken responses using text-to-speech technology. This makes it possible to create chatbots that can communicate with users through both text and voice, providing a more natural and convenient experience for users. One of the challenges of creating chatbots like ChatGPT is ensuring that they are able to handle user inputs in a way that is both accurate and respectful. This requires careful consideration of issues such as bias, sensitivity, and cultural context. To address these concerns, developers can incorporate ethical principles into their chatbot design and development process.

Overall, ChatGPT is an exciting technology that has the potential to revolutionize the way that we interact with computers. By creating chatbots that are intelligent, flexible, and adaptable, we can provide users with a more natural and engaging experience that meets their needs and expectations. As technology continues to advance, we can expect to see even more sophisticated chatbots that are capable of handling increasingly complex and nuanced conversations. One of the key benefits of ChatGPT is its ability to continuously improve its performance through machine learning. As users interact with the chatbot and provide feedback on its responses, the model can use this information to refine its understanding of language and generate more accurate and relevant responses in the future. This process

of continuous learning is known as deep learning, and it is a core component of artificial intelligence. By leveraging the power of deep learning, chatbots like ChatGPT can adapt to changing user needs and preferences over time, providing a more personalized and effective experience.

Another important feature of ChatGPT is its ability to handle multiple languages. The model can be trained on text data in a wide range of languages, making it possible to create chatbots that can communicate with users around the world. This is particularly valuable for businesses that operate in multiple countries and need to provide customer support in different languages. To ensure that the chatbot is able to handle multiple languages effectively, developers need to train the model on a diverse set of language data and use techniques such as machine translation to enable the chatbot to generate responses in the user's preferred language.

ChatGPT can also be integrated with other AI technologies to create more powerful chatbots. For example, developers can incorporate computer vision technology to enable the chatbot to recognize and interpret images or video. This can be particularly useful in applications such as e-commerce, where users may need help finding products or making purchasing decisions.

Finally, one of the key benefits of ChatGPT is its versatility. The chatbot can be customized to meet a wide range of needs, from customer service to personal assistance to social chatbots. By providing a flexible and adaptable platform, developers can create chatbots that are tailored to specific use cases and user needs.

As an artificial intelligence language model, ChatGPT faces several challenges, including:

1. Bias: AI models like ChatGPT are trained on vast amounts of data, which can contain biases that can be reflected in the output generated by the model. Bias can occur when the data used to train the model is not representative of the population or when the data contains patterns that reflect

historical biases and discrimination. Bias in AI can lead to unfair or discriminatory outcomes.

2. Generalization: While ChatGPT can generate coherent responses to a wide range of questions, it can still struggle with generalization. For example, ChatGPT may not be able to generate responses to questions outside of its training data or may struggle to understand nuanced or complex language.

3. Privacy: ChatGPT is trained on large amounts of data, which can include personal information. There is a risk that this personal information could be exposed or misused, which could result in privacy violations.

4. Continual Learning: ChatGPT is a machine learning model that can improve with additional training data. However, there is a risk that additional data could introduce new biases or cause the model to forget previous knowledge. Continual learning presents challenges for ensuring that the model remains accurate, unbiased, and ethical.

5. Security: ChatGPT, like any other computer system, is vulnerable to cyberattacks, including hacks and malware. If ChatGPT were to be compromised, it could result in the exposure of sensitive information or the generation of harmful or misleading responses.

6. Interpretability: ChatGPT generates responses based on complex mathematical algorithms, which can make it difficult to understand how it arrives at its answers. The lack of interpretability in AI models like ChatGPT can make it difficult to audit or understand how decisions are made, which can be problematic for transparency and accountability.

Addressing these challenges will require ongoing research and development in AI ethics, data privacy, cybersecurity, and transparency. As AI continues to evolve, it will be important to ensure that these technologies are developed and used in a responsible and ethical manner.

Climate Change – Is There a Possibility for Error Correction?

Prof. Jomy Augustine

Former Head, Department of Botany, St. Thomas College Pala

The long-term pattern of weather in a particular geographical area is popularly termed climate. This weather pattern is tracked for around 30 years to designate the characteristics of the climate. All climates are the product of many geological factors, such as latitude, elevation, topography, distance from the ocean, and location on a continent. Average temperature and precipitation are the major features of climate.

The climate system is maintained by the major components of the earth like the atmosphere, the hydrosphere, the cryosphere, the land surface, and the biosphere. The composition and movements of gases surrounding the earth constitute the atmosphere. Many natural and recent man-made causes such as pollution make changes in the highly variable structure of the atmosphere. Variations in the temperature and salinity of the oceans and other major water bodies are the changes in the structure of the hydrosphere. It is a much slower process compared to that of the atmosphere.

The cryosphere is those portions of Earth's surface where water is in solid form. All forms of solid water including sea ice, lake ice, river ice, snow cover, glaciers, ice caps, ice sheets, and frozen ground come under the cryosphere. The thermal conductivity of these solid water influences the climate more broadly by maintaining the earth's temperature.

The form and features of the land surface constitute topography. It refers to mountains, valleys, rivers, or craters on the surface. The topographic features of the land surface influence the kind of sunshine, the temperature, the flow of water and air, etc.

The total of life forms including plants, animals, and micro organisms constitute the biosphere. Individually and collectively,

they regulate the greenhouse gases like carbon dioxide in the atmosphere and hydrosphere. Animals absorb oxygen and release carbon dioxide through respiration whereas plants and photosynthetic microorganisms absorb carbon dioxide and release oxygen through photosynthesis.

From the permanent ice caps of the polar regions to the warm tropics of the earth there is a large number of variations in all the above-said components of the earth. These variations influence and create innumerable types of climatic situations throughout the earth. Also in the tropics, altitude plays a very good role. Climbing a lofty mountain or reaching a plateau is similar to the movement toward the poles.

No climate is uniform; rather each climate has numerous minor variations. These variations are microclimates. Interaction between the microclimates and genetic variations of organisms – mutations result in the existence of that mutation in the population if the mutation is suitable for the microclimate or rejection of that mutation. This repeated process for some generations is called evolution which originates new species to the earth. This new species is specific to that microclimate and without that microclimate, this species cannot survive. There are some species of plants and animals specifically linked to each microclimate. The process of evolution usually takes a time duration of about 35,000 years/generations for the origin of a species.

Climates and microclimates are not static. They are dynamic and undergoing changes. Some paleoclimatology evidence shows that the Sahara Desert was once covered by plants and lakes. The species linked to the climate and microclimates also change to fit the new/changed climate regime. Around 32,000 years are required for natural climate change and are a slow geographical process. It is a cumulative result of slow variations in the components of the earth like the atmosphere, the hydrosphere, the cryosphere, the land surface, and the biosphere. The movement of tectonic plates, volcanic activity, lava flow, and the

tilt of the Earth's axis also have similar effects on climate. So various populations of species can split, move among different climatic and microclimatic regimes, isolate, accumulate changes, and evolve into independent species. The existence of many climatic regimes and numerous microclimates and the natural changes in them that occurred in the past are the major reasons for the evolution of the enormous biodiversity on the earth.

Climate change in the present age is different from any natural climate change that happened in the past. The current climate change is due to the rise in the average global temperature, also called global warming. Global warming is not a new phenomenon in the history of the earth. Many times, the earth had undergone a rise and fall in average global temperature. One such phenomenon was the Pleistocene Glaciations. But, in most of these past events, the cooling and warming processes were very slow.

The sole source of energy to the earth is the unidirectional flow of solar energy. The absorbance of solar energy by the earth's surface is determined by the colour of the surface. The dark-coloured oceans and forests absorb most of the solar energy falling on them while the lighter-coloured ice and snow-covered surfaces reflect most of the light falling on them. When the rise in global temperature causes the ice and snow cover to melt more dark-coloured surfaces are exposed and more solar energy is absorbed causing even more global warming. For the most part, the solar energy coming to Earth as sunlight equals the energy leaving as infrared (IR) radiation. If it does not balance, Earth heats up or cools down. For the last two centuries, the energy budget of the earth has not been balanced.

The atmosphere allows sunlight to come to the earth's surface. The earth radiates out most of the energy in the form of Infrared radiation. The IR is caught by some molecules present in the atmosphere. This increases the temperature of the atmosphere. The gas molecules that prevent IR from being radiated to space are called greenhouse gases. Carbon dioxide,

methane, nitrous oxide, hydrochlorofluorocarbons (HCFCs), hydrofluorocarbons (HFCs), and ozone are the major components of greenhouse gases. These gases are already present in the atmosphere to keep the planet warm (around 33^0 Celsius). If these greenhouse gases are not there in the atmosphere, the mean global temperature would be a chilling -18^0 Celsius. So, these greenhouse gases are to be present in the atmosphere at an optimum level. The usual presence of carbon dioxide in the air is 0.03% and is almost constant for the last 3 million years. The constancy had been kept by two mechanisms. Contribution of carbon dioxide to the atmosphere by natural sources like outgassing from the ocean, decomposing vegetation and other biomass, volcanic eruptions, naturally occurring wildfires, and respiration. The second mechanism that removes carbon dioxide from the atmosphere is photosynthesis by plants. Photosynthesis converts the energy-trapping carbon dioxide to an inert carbon compound called starch. If the amount of carbon dioxide in the air is increased more IR is absorbed and hence the global temperature is increased. This is global warming. Since 1800 the global temperature is increased by 1.1^0 Celsius. The increase in carbon dioxide in the atmosphere is caused by two processes: The burning of fossil fuels like petroleum products and coal is the primary cause. The second one is the massive removal of natural forests – the carbon sink, by large-scale deforestation. 87 percent of all human-produced carbon dioxide emissions come from the burning of fossil fuels like coal, natural gas, and oil. The rest results from the clearing of natural forests and other land use changes (9%), as well as some industrial processes such as cement manufacturing (4%).

What must we face?

The impacts of global warming and climate change are diverse:

Hotter atmosphere – as greenhouse gases are more in the atmosphere, IR radiations are absorbed and re-emitted to the earth, and the temperature rises globally. The decade 2011-2020

is the hottest in the history of the earth. A hotter atmosphere makes wildfires vaster, more frequent, and easier. It also causes more extreme weather events, such as more intense hurricanes, floods, heat waves, and droughts, and leads to sea level rise and coastal erosion by accelerating the melting of glaciers.

More precipitation and severe storms – as more liquid and gaseous water are available due to the melting of the polar ice cap the rain pattern changes leading to extreme rainfall, severe storms, and destructive flood.

Severe drought – as more rainfall in some places, lesser rainfall in other already water-stressed regions. This results in the spread of deserts decreased cultivable land and failure of agriculture in broader areas. It also leads people to face the threat of not having enough water.

Threat to ocean ecosystem – as the temperature rises the volume of seawater increases added with more water from the melting of polar ice caps sea level rise. The presence of more carbon dioxide in the air makes seawater absorb more and become more acidic. This collapse of the marine ecosystem leads to a sharp decrease in marine wealth.

Extinction of species – many endemic species adapted to unique ecosystems face reduced or loss of fertility leading to extinction. Currently, the world is losing biodiversity at a rate 1,000 times greater than at any other time in recorded human history. At least one million species of plants and animals are at risk of becoming extinct within the next few decades.

Food shortage – food production will be sharply decreased as rain pattern changes, increased drought, and reduction in the cultivable areas.

Health risks - Changing weather patterns expand diseases, and extreme weather events increase the deaths of humans and livestock. Every year, environmental events take the lives of around 13 million people.

Poverty and displacement – less food production leads to high prices for food making them not available for the poor. The

mass movement of people from climate worse areas in search of food andhabitation will be increased. In the last decade (2010–2019), weather-related events displaced an average of 23.1 million people each year, leaving much more vulnerable to poverty.

What can we do?

Mitigation is a human intervention to reduce the sources or enhance the sinks of greenhouse gases. Mitigation measures are many. Our willingness is the prerequisite and is the most wanted one. Climate change mitigation demands a collective action problem at the global scale because most greenhouse gases (GHGs) accumulate over time and mix globally, and emissions by any agent affect other agents. But each effort, even though small, is significant globally. United Nations Secretary-General António Guterres called for game-changing climate action, to urgently cut greenhouse gas emissions and achieve climate justice. "No more excuses. No more greenwashing. No more bottomless greed of the fossil fuel industry and its enablers," he said in his remarks to the United Nations General Assembly, adding that "climate action is the 21st century's greatest opportunity to drive forward all the Sustainable Development Goals."

The **Paris Agreement** is a legally binding international treaty aiming to limit global warming to well below 2° C, preferably to 1.5° C, compared to pre-industrial levels. It was adopted by 196 Parties in 2015 at COP21 in Paris and entered into force in 2016. The Paris Agreement is a landmark achievement in international cooperation on climate change because it is a binding agreement for all Parties to scale up efforts to combat climate change. It also provides opportunities for developed nations to assist developing nations in their climate mitigation and adaptation efforts, while creating a framework for transparent monitoring and reporting of results.

Net Zero Greenhouse Gas Emissions by 2050

It is international scientific consensus that to prevent the worst climate damages, global net human-caused emissions of carbon dioxide (CO_2) need to fall by about 45 percent from 2010

levels by 2030, reaching net zero around 2050. It is to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century. To reach net zero, we need to both reduce our emissions going into the atmosphere and find ways to remove our past, present and future emissions.

Shall we suffer and adapt?

The heat-trapping greenhouse gases like carbon dioxide linger in the atmosphere for many thousands of years, and the planet (especially the ocean) takes a while to respond to warming. So even if we stopped emitting all greenhouse gases today, as a mitigation mechanism, global warming, climate change, and related repercussions will continue to affect future generations. Hence, we must prepare ourselves to live coping with at least some of the impacts of climate change.

It refers to changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change. The world is already experiencing changes in average temperature, shifts in the seasons, and an increasing frequency of extreme weather events, like hurricanes, unexpected floods in unexpected places, extensive wildfires, etc. Adaptation can range from building flood defenses, setting up early warning systems for cyclones, and switching to drought-resistant crops, to redesigning communication systems, business operations, and government policies. Some adaptations can be achieved by the human population, but what can be possible for other organisms whose biological activities are still dependent on the fragile ecosystem that is easily affected by climate change?

■

Himalayas:
A Tectonic and Ecological Hotspot

Prof. Jose K. Philip
Geography Trainer & Mentor

Himalayas are the young, mighty fold mountain ranges that form the northern boundary of the Indian Subcontinent. These highest mountains of the world have risen because of the severe compressional forces that occurred when the Austral- Indian plate collided with the Eurasian plate some 60 million years ago. The Himalayan Mountain ranges comprise several parallel mountain ranges like the Great Himalayas, Middle Himalayas, and Shiwaliks. The process of northward drift of the Indian Plate has not yet stopped and hence the Himalayan region remains tectonically active. Moreover, human settlements and human activity have converted this geologically weak zone into an ecologically fragile region as well.

The Himalayan region has been prone to natural disasters like earthquakes, heavy rains, flash floods, and landslides. The active plate margins under the Himalayas create pressure on the rocks and hence cause most of the earthquakes occurring in India. Several major earthquakes were recorded in the Himalayan region over the past 150 years like the Assam earthquake of 1950, the Uttarkashi earthquake of 1991, the Nepal earthquake of 2015, etc. In the wake of Turkey's earthquake in 2023, scientists are predicting a major earthquake in the Himalayan zone in near future.

The Himalayas are very steep on the Indian side and hence the monsoon clouds drifting northwards pile up in the Himalayan region. These clouds cause short, intense, and unexpected rainfalls called Cloudbursts and result in flash floods and landslides. Climate change has increased the frequency and intensity of Cloudbursts in the Himalayas.

Large floods in the Himalayan region are caused by intense rainfall events, cloud bursts, and outbursts of lakes dammed by

debris. The floods of Leh in 2010, the Kedarnath floods of 2013, and the Rishiganga floods of 2021 are recent instances of floods in the Himalayas.

The Himalayan regions are highly prone to landslides which lead to loss of life and property. Several natural as well as man-made factors are responsible for such landslides. The Himalayan regions encounter abrupt Tectonic activities that are responsible for the loosening of the soil and eventually cause landslides. Heavy rainfall on the steep slopes causes surface run-off and soil erosion. All these factors combine with climate change and global warming to cause landslides in the Himalayas. Moreover, man-made causes like human settlement, deforestation, mining, shifting cultivation, and developmental activities like roads, tunnels, and dams also contribute to landslides in the Himalayas. States like Himachal Pradesh and Uttarakhand arehighly prone to landslides.

A recent instance of a landslide happened in the hilly town of Joshimath in the Chamoli district of Uttarakhand. Joshimath is a strategic military Cantonment and a key transit point for tourists and pilgrims. It is located on Rishikesh- Badrinath National Highway (NH 7). Here, due to land subsidence, roads, and dwellings have developed cracks and have become unusable. The whole town is located on the debris of old landslides. Hence afforestation and other soil-conserving strategies like stopping developmental activities, improving drainage, etc. alone can prevent Joshimath from becoming a ghost town.

The Himalayas are one of the most vulnerable regions to climate change. Extreme weather conditions are common in the Himalayas, and they produce climate disasters throughout the region. In the recent past, changes in climatic conditions have been accelerated by population growth and deforestation. Climate change has resulted in increasing instances of forest fires, avalanches, shrinking of ice caps, etc in the Himalayan region. Several of the natural springshere have drained up in the recent past due to deforestation. The increased surface run-off of rainwater has added to the severity of floods and landslides.

Infrastructure projects like roads and dams are a threat to Himalayan ecology. These projects destabilize slopes and add to the effects of glacial floods and avalanches. The strategic importance of the Himalayas hasinvited some of these development projects, for example, the Char Dham Highway project. However, we must restrain ourselves from such unmindful projects to conserve the Himalayan ranges and their very existence.

■

Disaster Management Framework in India

Jubin James
Chief Academic Coordinator, CSIP

On the cold evening of February 2023, the countryside as well as buzzing urban centers of Kahramanmaras in Turkey felt trembles resulting in the death of about 45000 people. About twenty-two years ago India too felt the wrath of nature in Gujarat in the form of an earthquake which was followed by a Tsunami in 2004 and innumerable landslides and floods later on. To resist, mitigate, adapt, and rehabilitate,the Indian government in association with different civil society groups, local governments as well as the public has made a Disaster management framework.

Disaster Management Act 2005

Disaster Management Act 2005 was one of the first legal efforts by the Government of India to tackle disasters and to create, empower and legalize the working of different agencies related to disaster management. It defines Disaster Management as an integrated process of planning, organizing, coordinating, and implementing measures that are necessary for the prevention of the threat of any disaster, reduction of risk of any disaster or its consequences, readiness to deal with any disaster, promptness in dealing with a disaster, assessing the severity of the effects of any disaster, and finally ensuring rescue, relief, rehabilitation, and reconstruction. This act has also established different bodies to coordinate disaster management all over India.

National Disaster Management Authority

National Disaster Management Authority (NDMA) was established for laying down the policies, plans, and guidelines

for disaster management and to ensure a timely and effective response to disaster and also for laying down guidelines to be followed by the State Authorities in drawing up the State Plans. NDMA is headed by the Prime Minister of India as chairperson and it shows the crucial significance of this authority in India. NDMA may have no more than nine members including a Vice-Chairperson and the tenure of the members of the NDMA shall be five years.

National Executive Committee (NEC)

From 1995 to 2020, India experienced 1,058 floods, cyclones, droughts, cold waves and heatwaves. Floods accounted for 33% of these disasters, followed by heatwaves (24%), droughts (22%), cold waves (16%) and cyclones (5%), according to the report by NIDM.

The NEC is responsible for the preparation of the National Disaster Management Plan for the whole country and to ensure that it is reviewed and updated annually. The Home secretary to the government of India acts as the ex officio chairperson of the committee. The NEC is composed of Secretary level officers of the Government of India in different Ministries. The Chief of the Integrated Defense Staff of the Chiefs of Staff Committee is an ex officio member of the NEC.

The National Disaster Response Force (NDRF)

The National Disaster Response Force (NDRF) is an Indian specialized force constituted for a special response to a threatening disaster situation or disaster under the Disaster Management Act, 2005. National Disaster Response Force (NDRF) is under the National Disaster Management Authority. The head of the NDRF is designated as Director General and are IPS officers on deputation from Indian police organizations. It is a force of 16 battalions, organized on para-military lines, and manned by persons on deputation from the para-military forces of India.

National Disaster Response Fund

The National Disaster Response Fund is a fund managed by the Central Government and is used for meeting the expenses incurred during emergency relief, disaster response, and rehabilitation in the event of a disaster. The NDRF is placed in the Public Account of GOI under reserve funds not bearing interest. Since it is placed in public accounts, the government does not require parliamentary approval to take money out of this fund. The NDRF is audited by the Comptroller and Auditor General (CAG). Natural calamities such as earthquakes, cyclones, drought, fire, tsunamis, floods, landslides, hailstorms, avalanches, pest attacks, and cloud bursts are deemed to be severe by the Indian Government and for which the state government requires funds in excess of the balance available with its SDRF are covered under NDRF.

Role of State Government:

The basic responsibility to ensure rescue, relief, and rehabilitation measures in the event of natural disasters rests with the state government. State government plays a major role in executing as well as funding disaster relief operations in a state. State Disaster Management Authority is responsible for the Preparation of Minimum Standards of Relief, State Disaster Management Policy, and Mitigation plans vis a vis various hazards and Coordinates and monitors the implementation of National Policy, National Plan, and State Plan. Each state has a corpus of funds, called the State Disaster Response Fund, administered by a state-level committee headed by the Chief Secretary of the State Government.

Role of District Administration:

The District Magistrate/Collector has the responsibility for the overall management of disasters in the district. He has the authority to mobilise the response machinery and has been given financial powers to draw money under the provisions of the General Financial Rules/Treasury Codes.

Role of Local Self-Governments:

For the people, LSGs are the nearest units of administration and are among the first responders to any crisis besides being closely knit with the communities. These units can thus play an important role in crisis management under the overall leadership of the District Administration.

Role of Public/NGO/Civil Society/Media:

The local community is usually the first responder in case of a disaster. The local community also carries traditional knowledge and relevant counter measures regarding disaster management.

Mobilization of community action supported by local NGOs, along with government machinery is a must for quick, efficient, and effective response. Local NGOs and civil society must work on developing a deep culture of safety and prevention in society. NGOs, civil society, and media also play an active role as pressure groups in a democracy so that any laxity on part of the government can be traced and fixed.

International Initiatives

India plays an active role in global initiatives on disaster management. India is a signatory to the Sendai Framework for Disaster Risk Reduction. With multi-dimensional initiatives and expertise, India is taking a leading role in strengthening regional cooperation among different countries for reducing disasters.

India is one of the participating countries and works closely with the United Nations International Strategy for Disaster Reduction (UNISDR). India also organizes different exercises such asthe South Asian Annual Disaster Management Exercise (SAADMex).

Humanitarian Aid

A team of rescuers, Doctors, and para-medicos are winning the hearts of the local people by saving the lives of young and old trapped inside the rubble in Turkey. India is reputed for her rescue missions abroad both due to crises arising out of civil/military unrest or natural calamities which includes Operation Raahat (2015) in Yemen, Maitri (2015) in Nepal, SankatMochan (2016) in South Sudan, and Ganga (2022) in Ukraine.

Notwithstanding all these efforts and initiatives, India has to focus on research and development for creating robust early warning systems. Integrating big data technology as well as Artificial Intelligence will help in better mitigation and adaptation.

■

Higher Education: In Need of the Inevitable Finishing Touch

Dr. K. M. Naseer,

Principal, Farook College (Autonomous) Calicut

"All organisations are organic and imperishable. They are all created by people and they need to be constantly recreated if they are to survive." (Out of Our Minds by Ken Robinson)

India is home to 1,000 universities and 44,000 colleges with more than 40 million higher education students. India is set to witness a major transformation in the higher education space. Higher education has come to the necessity of carefully evaluating the educational processes that transfer knowledge to the next generation. Ever since the founding of the Calcutta Madrasa by the East India Company in 1781 under the direction of Warren Hastings and the Sanskrit College by Jonathan Duncan in 1791, India has had a tradition of education for two hundred and forty-two years, leading up to National Education Policy 2020. The effectiveness of contemporary educational methods should be assessed in light of evolving economic, scientific, and technological conditions.

"Students are natural learners with instinct learning capacity. But capacity varies from one to another. So standardized tests should not be the dominant culture of education. It Should be diagnostic and understanding not memorizing." Instead of memorization, modern education should emphasise the creative application of learned skills. Online or offline, there are no limits to an educational system that rewards and encourages creativity in the application of learned information and goes beyond rote memorization. If the long-standing culture of our education, which assesses students' aptitude only based on particular subjects, has not undergone the required modifications, traditional education will not be able to meet the needs of the current world. On the other hand, the potential of traditional education is limitless if it goes beyond the requirements of marks

in particular disciplines and reaches the level of encouraging application and creativity. The broader perspective that education is about contemporary creativity rather than discipline and control needs to be incorporated into modern educational thoughts.

Molding a creative generation through education in India is a matter of time as well as a need for survival. Around fifty-six crore people in India are under the age of twenty-five, over twenty-three crore children are between the ages of ten and nineteen, and two-thirds of the country's population, or nearly 85 crores, are under the age of 35. These population figures turn all the different possibilities of Indian youth into severe trials by fire. At the same time, India is experiencing a very positive demographic dividend. The country's population between the ages of 15 and 64 who are capable of working is referred to as its demographic dividend. India's population is made up of about 62 percent of people between the ages of 15 and 64. This favourable demographic dividend of over 800 million people should be able to be converted into useful employment through modern education. The demographic dividend that any nation would like to have is likely to have the reverse consequence of causing tremendous unemployment in India if higher education is not upgraded to meet the needs of the modern world. If we fail to provide the necessary intellectual change and finishing touch in higher education, the positive demographic dividend could turn into a demographic nightmare.

The most significant trends in higher education are the rise of virtual learning, emphasis on concept-based learning, gamification of learning, desire for unconventional courses, and the role of artificial intelligence. Even with the inclusion of opportunity denial and inequality as barriers, the potential of online education in India is astounding. In India, the market for online education was estimated to be worth Rs 39 billion in 2018 and is projected to be worth Rs 360.3 billion by 2024. These expectations are based on cutting-edge learning technologies like blockchain, big data analytics, machine learning, and artificial intelligence (AI). With 37.4 million students in higher education,

India is considered the world's second-largest online education market after the United States. For the much-needed digital push in higher education, there is a need for rapid development of digital learning resources and the fusion of traditional teaching with new technologies.

Currently more than ever, concept-based learning must be emphasized in higher education. Teachers should also urge their pupils to "learn by doing" things. The practice of incorporating gaming aspects into the learning environment is known as "gamification of learning." The Indian educational system needs to be systematically modified to stimulate students' interests. Gamification will increase the effectiveness and fun of learning and motivate students to keep studying. Gamification will stimulate Gen Z's interest, and they will do better in a digitally driven, application-based learning environment. The demand for innovative courses like data analytics, data science, big data, etc. must be assessed and integrated into the curriculum. In non-traditional courses, creativity and critical thinking are key components. In education, artificial intelligence (AI) is becoming more apparent. To maximise the potential of future higher academics, the exciting potential of artificial intelligence must be taken into account. This will help the Gen Z generation of today become the entrepreneurs and innovators of the future. The World Economic Forum report states that critical thinking and problem-solving will be the top abilities that companies look for. In this day and age, employers are seeking self-management abilities including stress management, resilience, creativity, and active learning. India's higher education system ought to be able to provide all of these needs to a standard that is comparable to that of the rest of the world. As India's higher education system enters a new era, it should be able to evolve more dynamically to meet the needs of the coming generation.

"Current systems of education were not designed to meet the challenges we now face. They were developed to meet the needs of a former age. Reform is not enough: they need to be transformed. " Ken Robinson.

The Young Should Work Towards a Gender-Equal Society

Adv. Jyothi Radhika Vijayakumar
Civil Services Trainer

As human beings and citizens of a democratic country and society, we are supposed to live in a world characterized by equality of all human beings, with Article 14 in the Indian Constitution stating that "The State shall not deny to any person equality before the law or the equal protection of the laws within the territory of India, on grounds of religion, race, caste, sex or place of birth" and Article 15 emphasizing that "The State shall not discriminate against any citizen on grounds only of religion, race, caste, sex, place of birth or any of them."

In the background of this Constitutional principle, it is imperative at this point for today's generation to deliberate upon the state of equality in our society that is in a process of transition from tradition to modernity, still retaining its hierarchical nature in terms of caste, class, religious and gender biases. As a deep inquiry into all these biases that tend to subjugate and dehumanize human beings would be beyond the scope of this piece, we would focus on the state of gender equality in our society.

While sex denotes the biological differences among human beings gender indicate a social construct, prescribing certain psychological and social attributes for those of male and female sex as masculine and feminine. And, being transgender is a state in which there is no match between the sex assigned at birth and perception and awareness of one's gender oneself. One of the defining social systems of our society has been patriarchy which authenticates and normalizes the dominance of men over women and the subjugation and secondary status of women.

While observing the social institutions that define our society it is clear that almost of all them; like marriage, family, and religion are patriarchal. It is patrilineage, tracing one's lineage

through father's line, and patrilocality, staying at one's father's place, etc., are normalized in society. And, what happens in most homes through the process of socialization is the inculcation of gender stereotypes in girls and boys through bringing up girls as adaptable and adjusting for marriage and motherhood, while preparing boys to be strong, assertive, and courageous enough to carry the 'burden of the family on their shoulders." And, also there is the persistence of sexual division of labor at home where women are supposed and trained to do household chores and take care of the parenting and men are supposed to deal with activities outside the home.

This gender bias is reflected in textbooks and school curricula, the interaction between girls and boys among peer groups, at school, in traditions, customs, language, mass media, movies, social media, etc. And, misogyny in public spaces is normalized, along with an inadequate representation of women in centers of power and decision-making in different spheres, with women's representation in the state and central legislatures being a pointer towards the reality. All these together become fertile grounds for the practice of dowry, domestic violence, structural violence inherent in institutions, sexual harassment against women, and non-acknowledgment and inadequate utilization of women's skill set and talent.

At a deeper level, what we witness as the outcome of the institutionalization of patriarchy is the unapologetic use of violence against women, starting from the womb as female foeticide, then female infanticide, molestation, sexual harassment, acid attack, rape and murder, dowry harassment, dowry death, domestic violence, marital rape, human trafficking and so on. There is a grave unfortunate situation of economic and educational progress not resulting in the reduction of violence and atrocities against women. This is also evident in the human rights violations that transgenders and members of the LGBTQIA community face.

What the patriarchal social institutions and the patriarchal public space do is take away women's equal rights. Their

individuality and self are often sidelined in the context of the roles they have to perform as daughters, married women, and mothers. In a society which gives much premium on marriage and family, there is discrimination towards women who opt for a divorce, who remain unmarried, and who do not choose to be mothers, and trans women and women belonging to the LGBTQIA+ (Lesbian, gay, bisexual, transgender, queer, intersex, asexual, and more) community.

In this situation, in the background of the modernization of Indian society, modern education, and understanding of and awareness of human rights, it is a must that youngsters of this generation ask the necessary questions, develop their understanding of gender, challenge the existing notions, break gender stereotypes, neutralize gender roles, give primacy to diversity and inclusion in all spaces and do their best to assert the status of women and transgenders as equal human beings.

When women are not treated well, that is a blot on the consciousness of this society and would hamper the growth and development of the nation in the political, economic, social, and cultural spheres. Though there are provisions for equal opportunities, it hardly becomes a reality as there is differential possession and appropriation of political, economic, social, and cultural capital by human beings of different genders.

So, the young generation must realize that patriarchy is a system of dominance and subordination, which is unhealthy in a democracy. It dehumanizes human beings and is harmful to all genders. We bring up boys with toxic masculinity that makes them prone to aggression and violence and girls as passive, not questioning things in general. Realizing the harm it does to all is the beginning point of understanding to move away from the system.

At the same time, there should be conscious efforts to make our marriages, families, and religions less patriarchal and more egalitarian. There should be a conscious stand against dowry, domestic violence, and marital rape. There should be awareness in school, among parents and teachers. When girls are made to

feel equal, given education, and are enabled to say No, and when boys are trained to treat girls as equals and respect them from childhood itself, the attitude of domination, patronizing, and protection would change and the issue of public safety of women would be largely addressed.

It is a beautiful dream to witness a society where people of all genders are treated equally with dignity and provided with equal opportunities and the social capital to use them. And, as change agents, youngsters must realize the futility and harm in all unequal social structures, mainly patriarchy, and do their best to contribute towards an egalitarian society where gender equality would become a norm in society.

■

Changing Scenario of Education in the 21st Century – NEP 2020

Dr. Thara Thomas
Assistant Professor, Department of
Economics, Baselius College, Kottayam

The National Education Policy 2020 (NEP 2020) is formulated to revamp the education system and lay down the road map for new India. It was approved by the Indian cabinet on 29th July 2020.In 2019, the Ministry of Human Resource Development (MHRD) released a Draft of NEP, 2019, which was trailed by several ideas and consultations offered by the stakeholders and the public. The Draft NEP discusses reducing curriculum content to enhance essential learning and critical thinking. The objective is to promote holistic experiential, discussion-based, and analysis-based learning. It also talks about a revision of the curriculum for the first time. On July 29, 2020, the cabinet approved a NEP intending to introduce numerous changes to the prevailing education system in India. Appropriate and liberal, the NEP 2020 scripts a significant advance in our education system.

Highlights of New Education Policy 2020

School Education

Early Childhood Care and Education(ECCE): Foundation of Learning – NEP ensures quality early childhood care and education for all children between 3-6 years. NEP extends the Right to Education eligibility window from 6-14 years to 3-18 years. Intending to have 100 percent of children 'school-ready' by 2030, the policy pushes for the Universalization of ECCE. Investment in infrastructure such as play equipment and child-friendly buildings, as well as Continuous Professional Development (CPD) of ECCE teachers and Anganwadi workers through a six-month certification programme, including some online components are also included.

Foundational Literacy and Numeracy: NEP establishes National Mission on Foundational Literacy and Numeracy, which

is a three-month preparatory course for students. It is considered an urgent prerequisite to learning. It is based on digital content through energized textbooks. It is student-led peer learning and community tutoring is recommended as some of the means to achieve 100 percent foundational level (up to Grade 3) learning by 2025. Teacher vacancies are also recommended to be filled in a time-bound manner, with a priority on disadvantaged areas and sections of society.

Curtailing Dropout Rates: By this NEP 2020, the current 10+2 system is to be replaced by a new 5+3+3+4 curricular structure corresponding to ages 3-8, 8-11, 11-14, and 14-18 years respectively. There are two targets of NEP 2020 – one is the Universalization of education from preschool to secondary level with a 100% Gross Enrolment Ratio (GER) in school education by 2030 and the other is to bring 2 crores out of school children back into the mainstream through an open schooling system. NEP provides Universal Access to Education at all levels. Investment in resources such as infrastructure and teachers for students till Grade 12, as well as ensuring social workers and counsellors are made available to students, so they can address factors contributing to dropout rates. It promotes rigorous tracking of 100 percent of children, through a technology-based platform to ensure no one is left behind. It also emphasizes encouraging different public-private partnership school models to curtail the number of dropouts and out-of-school children.

Curriculum and Pedagogy in Schools: NEP 2020 promotes Holistic, Integrated, Enjoyable and Engaging learning. The policy encourages local languages to be the medium of instruction for at least up to Grade.

It promotes bilingual education and textbooks for learning as well as multiple languages at middle and secondary levels. It suggested multi-disciplinary approach and reduction in content by targeting core learning competencies. New-age subjects such as coding and computational thinking are introduced at a middle school level. Students can now choose subject courses in secondary school (primarily in arts, physical, and vocational

education).

Teacher and Teacher Education: The policy proposes the minimum teacher education degree requirement to change from the current two-year degree to a four-year B. Ed. undergraduate programme, by 2030. Excessive teacher transfers should not be promoted, in principle, leading to better continuity with students, also for provision for local residence. An advance new and Comprehensive National Curriculum Framework for Teacher Education 2021 will be prepared by National Council for Educational Research and Training (NCERT) and National Council for Teacher Education (NCTE) 2021

Standard-setting and Accreditation for School Education: It promotes transparency and accountability across schools by setting standards through a dedicated agency, which incorporates learning-related indicators as well as student feedback into school ratings.

Higher Education

Quality Universities and Colleges: M. Phil. courses will be discontinued and all the courses at undergraduate, postgraduate and PhD levels will now be interdisciplinary. It has advanced towards a more holistic and multi-disciplinary education setting up a Multi-disciplinary Education and Research Universities (MERUs)

Academic Bank of Credit (ABC):

NEP, 2020 proposes that an Academic Bank of Credit (ABC) shall be established which will digitally store the academic credits earned from various recognized HEIs so that the degrees from an HEI can be awarded considering credits earned. Accordingly, the UGC with the approval of the Central Government framed the Regulations for the establishment and operation of the Academic Bank of Credits (ABC) in Higher Education. ABC shall be a national-level facility to promote flexibility of curriculum framework and interdisciplinary or multidisciplinary academic mobility of students across HEIs in the country with appropriate credit transfer mechanism and shall facilitate students to choose their learning

path to attain a Degree or Diploma or PG Diploma or academic qualification, working on the principle of multiple entry – multiple exit as well as any-time, any-where, and any-level learning. It will provide significant autonomy to students by providing an extensive choice of courses for a programme of study, flexibility in curriculum, and novel and engaging course options across several higher education disciplines or institutions.

Catalysing Quality Academic Research in all Fields through a New National Research Foundation: The National Research Foundation will be established as a top body for fostering a strong research culture and building research capacity across higher education.Multidisciplinary Education and Research Universities (MERUs), at par with IITs, and IIMs, are to be set up as models of the best multidisciplinary education of global standards in the country.

Higher Education Institutions

The Higher Education Commission of India (HECI) will be set up as a single umbrella body for the entire higher education, excluding medical and legal education. Public and private higher education institutions will be governed by the same set of norms for regulation, accreditation, and academic standards. HECI will be having four independent bodies-

· National Higher Education Regulatory Council (NHERC) for regulation,

· General Education Council (GEC) for standard setting,

· Higher Education Grants Council (HEGC) for funding,

· National Accreditation Council (NAC) for accreditation.

Other Key Areas of Focus

Professional Education –

Professional Education will be an integral part of the higher education system. Stand-alone technical universities, health science universities, legal and agricultural universities, or institutions in these or other fields, will aim to become multi-disciplinary institutions.

Technology Use and Integration: Ensuring Equitable Use of Technology

The National Educational Technology Forum (NETF) is an autonomous body. It provides a platform for the free exchange of ideas on the use of technology to enhance learning, assessment, planning, and administration. It promotes the appropriate integration of technology at all levels of education.

Conclusion

The NEP 2020 offers an elaborative framework so that there can be development in the educational system of the country. Generally, it takes decades to replace the policy. The current policy is third in sequence and replaces the NEP 1986. The NEP 2020 provides a concrete path to education in the country. However, it is also not mandatory to follow. Under NEP 2020, the top universities across the world will be able to start their campuses in the country.

The essence of this policy is the introduction of multi-disciplinary, inter-disciplinary, and trans-disciplinary approaches to humanising education with an emphasis on humanities-related subjects. Besides, this policy has got an emphasis on vocational skills to meet the growing employment needs as also the focus on employability through skilling. The present policy is considering the training of teachers as an important ingredient. The flexibility is offered in the present policy in education which would take care of high dropout levels through transferable credit banks. The emphasis is given to the mother tongue/ local language at the primary level, which would surely minimize the dropout level and improvise the learning capacities of students at the primary level. Furthermore, the NEP 2020 makes ready ahead for some youthful, hopeful understudies to be furnished with a privileged skill set. Its appropriate execution will be the way to prosperity. It will be carried out till grade V. With NEP 2020, it is expected to revolutionize the education scenario in the coming future, and this will certainly push India's claim towards becoming a superpower in the future.

Add - On Course

IAS Coaching along with college studies

ONLILE / OFFLINE

Features

★ 600+ hours of classes
★ Complete coverage of syllabus
★ Periodic exam
★ Study materials

★ Mentoring
★ Daily news analysis
★ Classes held without affecting college studies

Other Courses

1. Full- Time Course for Graduates
2. Foundation Course 'Charisma' for HSS Students
3. Prelims Crash Course
4. ISP Test Series
5. ARISE for Repeaters
6. Coaching for Optional Subjects
7. KAS Coaching
8. Interview Coaching
9. Beautiful Minds for UP and HSS Students

The Sure Path To Your Glittering Success!!

Where professionalism *is* trained.

SJCET PALAI

ST. JOSEPH'S
COLLEGE OF ENGINEERING AND TECHNOLOGY,
- P A L A I -

COLLEGE CODE:
SJC

B.Tech • M.Tech • Ph.D • MBA • MCA

PROGRAMMES OFFERED:

B.Tech Programmes
1. Artificial Intelligence and Data Science (AD)
2. Civil Engineering (CE)
3. Computer Science & Engineering (CS)
4. Computer Science & Engg. (Cyber Security) (CY)
5. Electronics & Communication Engineering (EC)
6. Electronics & Computer Engineering (ES)
7. Electrical & Electronics Engineering (EE)
8. Mechanical Engineering (ME)

Ph.D (Full-time & Part-time)
1. Computer Science & Engineering   2. Electronics & Communication Engineering   3. Mechanical Engineering
4. Management Studies   5. Computer Applications

Post Graduate Programmes
1. Master of Business Administration **(MBA)**
2. Master of Computer Applications **(MCA)**
3. *M.Tech in:*
   1. Advanced Manufacturing & Production Management
   2. Computer Science & Engineering
   3. Structural Engineering & Construction Management
   4. VLSI & Embedded Systems

585+ Placement offers *for 2022 passout batch*

NCC
Self- Financing Engineering College with NCC (Army) Unit

B.Tech & M.Tech Enquiries : +91 8078 700 700   +91 8078 700 701
NRI Seats: +91 8078 701 701 • **MBA:** +91 7034 73 73 99 • **MCA:** +91 7034 76 76 99

www.sjcetpalai.ac.in
r.

MANAGED BY THE **CATHOLIC DIOCESE OF PALAI** • APPROVED BY AICTE • AFFILIATED TO APJAKTU, THIRUVANANTHAPURAM

printed@ boys town press, pala; mob: 9400713469