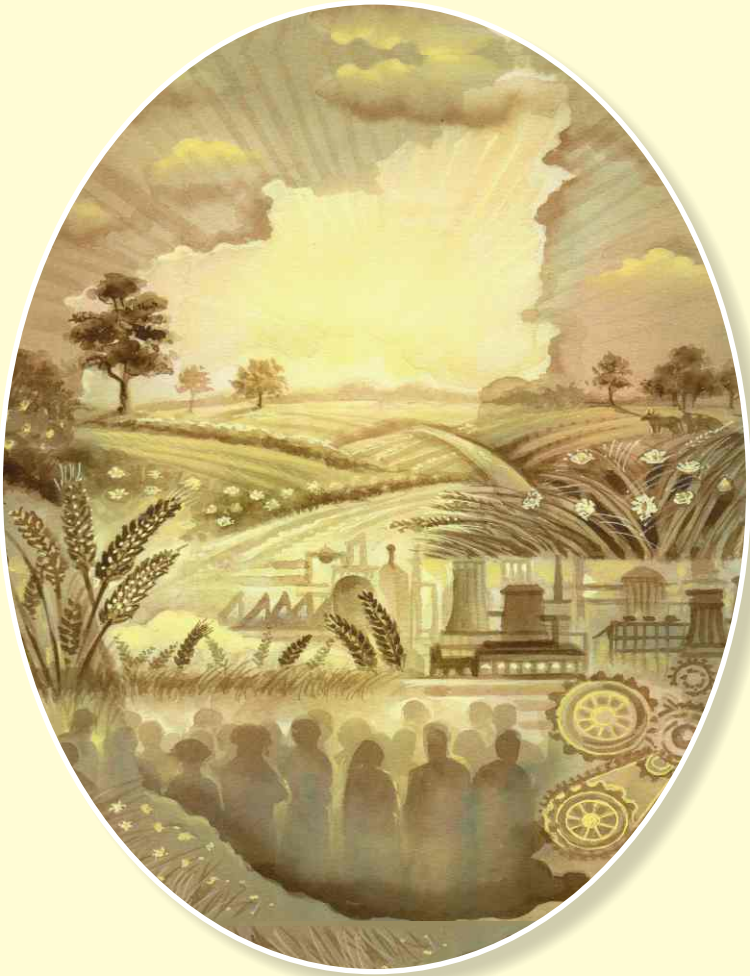
Vision 2030



Karnataka Science and Technology Academy

Department of Science & Technology

Government of Karnataka

November, 2020

Vision 2030

Karnataka Science and Technology Academy

Department of Science & Technology

Government of Karnataka

November, 2020

Citation:
KSTA, Government of Karnataka, 2020.
VISION - 2030.
Karnataka Science and
Technology Academy, Bengaluru, pp. 10

KSTA Executive Committee 2020-2023

Published by
Karnataka Science and Technology Academy
College of Horticulture Entrance, GKVK Campus,
Major Sandeep Unnikrishnan Road,
Vidyaranyapura Post, Bengaluru 560097
Tel: 080-2972 1550; Email: ksta.gok@gmail.com;
Website: www.kstacademy.in
Cover page Designed by: Shri Sateesh S Rao

Dr. ASHWATH NARAYAN C.N.
Deputy Chief Minister
(Higher Education, Electronics, IT, BT,
Science and Technology, Skill Development,
Entrepreneurship & Livelihood Department &
Ramanagara District incharge Minister)

Room No. 242-243
2nd Floor, Vikasa Soudha
Bengaluru - 560 001
Tele : 080-22258965
080-22034647

No. DCM/HrEdn.IT&BT.S&T.SD/3659/2020-21

Date : 13-08-2020

MESSAGE

Karnataka has a heritage of royal support to Science & Technology, that combined with quality resources, both natural and human, has made the State a leader in education and scientific pursuits. It has always been in the forefront of Science-led and Technology-based enterprises, with Bengaluru recognized as a Science City. A host of institutions possessing diverse talent combined with the entrepreneurial ambience have also enabled unparallel innovations.

As other States, Karnataka too has its unique natural resources in terms of land, water, forests, wildlife, coast, mines and so on, and key sectors of IT, BT, Health, Education, Industry, Agriculture, Communication, etc. that

have been receiving S&T inputs, as well as generating knowledge. The economic canvass is diverse, with multi-stakeholders from 'cottage to corporate', distinct from others.

The ideas and tools of Science & Technology have pervaded all sectors of economy, providing for enhanced wealth as well as societal welfare, as an evidence of 'science for society'. The COVID-19 pandemic, impacting all segments of the economy globally, has brought into fore the strengths as well as the need for more science, technology and innovations.

I am happy to note that the Karnataka Science and Technology Academy (KSTA), a Unit of the Department of Science and Technology, Government of Karnataka, has prepared the 'VISION-2030', as a reference and guide for us to plan our programmes. My compliments to the Team KSTA. I am sure this will be a forerunner for analysing our footprints in Science & Technology, as well as projecting the future, with the three pillars of Foresight, Innovations and Partnerships.

(Dr. Ashwath Narayan C.N.)

Karnataka Science and Technology Academy
Department of Science & Technology
Government of Karnataka

VISION - 2030

Preamble

Science & Technology have been playing a pivotal role in our daily lives and in every segment of the economy. Indian scientists and academicians have been celebrated globally, yet society at large, considers science as extrinsic and only as a subject of study or a career. The realisation and appreciation of the enormous tools and applications that have improved our lives are limited to sections of society, with literacy as a kind of prerequisite. Modern India has made several efforts and investments towards establishing institutions, research & educational, academies, along with non governmental and corporate initiatives, towards science literacy, awareness and communication, that need to be highlighted.

Karnataka is in the forefront with regard to scientific establishments, including the Karnataka Science and Technology Academy, functioning since 2005. With Bengaluru, the Science city, as a cradle for new sciences along with innovations, and also an educational hub, the Academy is visioning the next decade for STI (Science, Technology & Innovations) acceptance, appreciation and adoption. Keeping a decade as a time frame for the document, it is necessary to formulate the Vision-2030, with due reference to the resources potentials as well as aspirations of people of the State.

Profile

The State of Karnataka, with over six crore people inhabiting 30 Districts, has more than 60% of the population residing in rural areas. With three distinct geographical regions of Coastal plains, Western ghats and the Deccan plateau, the State's biodiversity is estimated at over a lakh species, as also five national parks and 24 wildlife sanctuaries. The forest cover is to the tune of 22.6% of 191,791 sq. km. being more than 6% of India's forest resources.With predominant rainfed farming contributing over 5% to the country's food basket, the State is known for its horticulture and dairying in the primary sector.

With a literacy rate of over 75% and sex ratio of 973, both of which are higher than the national average, Karnataka is one of the fastest growing states in the country. The SGDP is of the order of over Rs 17 lakh crore with an annual growth rate of about 7% and per capita of Rs 2,31,246/-, fourth highest in the country and constituting nearly 6% of the national GDP. With a legacy of industries from the pre-Independence era, as for example, iron & steel, sandal, etc., the State has a vibrant, automobiles, agro, aerospace, textile & garments, biotech, heavy engineering industries, with special economic zones for IT, BT, engineering, food processing and aerospace. Karnataka is known as the IT hub of India, with over 400 of the Fortune Global 500 companies outsourcing their IT services to companies in Bengaluru. The contribution levels of Agriculture, Industry and Services to the SGDP are 10.97%, 22.84% and 66.19% respectively.As regards secondary and higher education, the State has over 10,000 secondary schools with 15 lakh students and one lakh teachers; 43 Universities, 3,400 UG Colleges, 192

Engineering Institutions, 42 Medical Colleges, 38 Dental Colleges, 248 Polytechnics, all with about 20 lakh students. Over 400 R&D Centres of both Central and State governments as well as Corporate, are located in the State. These indicate the contributions as well as potentials for STI in the State.

Scenario

World in 2030 by all projections, further exacerbated by the unprecedented COVID-19 pandemic in 2020, would see major changes in demography, climate, natural resources, food systems, energy & waste management, digital economy and communication. India would not remain an exception in the intense global interdependence paradigm.

As regards importance of S&T in any country, common indicators used are, the governmental expenditure on R&D, number of researchers per million population (FTE: Full Time Equivalent), number of publications and patents. The governmental investment in R&D at the central level works out to 0.7% of the annual GDP; 5.52 lakh FTE researchers, of which 19% are women; 255 researchers per million population, a total of 3,41,818; University student enrolment of 3.74 crore with a GER of 26.3% and faculty of 14.16 lakhs; Number of Doctoral students annually, 40,823, making India the third in the world's ranking; Number of scientific articles every year, 1,35,788, with an annual growth rate of about 10%, with India at the tenth position in the world; 15,550 patents filed annually, of which Karnataka's contribution is 2,022 (AISHE, MHRD, GoI, 2019; DST, MoST, GoI, 2020).

While similar statistics for the State would need to be generated in greater details, it is evident from the profile that

Karnataka is poised for a leadership role in knowledge economy. However, it is also to be recognised that divides of rural-urban, digital, etc. are also glaring. With transformational changes happening in every segment of economy across the world, India is also looking forward for youth empowerment through the recently unveiled National Education Policy-2020 and forthcoming National Science, Technology Innovation Policy-2020. The emphasis is on 'Skills for 21st Century with a Global canvass'. Hence, this is an opportune moment to formulate a Vision for the Karnataka Science and Technology Academy, aligning with the Sustainable Development Goals, that are intended for 2030.

Strengths & Opportunities

The Karnataka Science and Technology Academy has been established by the Government of Karnataka under the Department of Science and Technology, with a view to serve as a Nodal agency for Science & Technology Communication, Capacity building and Entrepreneurship. Academia involvement, Statewide reach, Diverse partnerships and Dynamic linkages with Governmental agencies as well as stakeholders are the strengths of the Academy.

Despite the progress made, there are perceived gaps with regard to both applications and appreciation of S&T tools in all sectors of economy, for enhancing efficiencies and achieving global standards. Sectors of agriculture, health, education, MSMEs are a few examples in this regard. There is a clear vacuum of effective science communicators, science teaching in rural areas, hands on and skills in tech-based industries, polishing schools for professionals and so

on. Women Empowerment and Development of Backward Regions of Karnataka through S&T tools needs a greater emphasis.

It is heartening that at the same time, the Indian diaspora, people from Karnataka to be more specific, are eager to share their expertise and experience for the benefit of the students and youth of the State. These provide an opportunity and awide canvass for the Academy to establish both backward linkages and with Secondary Schools & Colleges, Universities & Research Institutes, as also farm-industry combine, to enhance science literacy and use of scientific tools and techniques in the society.

Vision

To nurture and enable Knowledge, Science & Technology for All

Mission

To play a pivotal role in Science promotion, Technology dissemination and fostering Innovations for Societal Welfare, through the following aspects:

1. Appreciation of Science as innate rather than external, among the stakeholders for the desired ownership at all levels of Society
2. Scientific literacy and technological capabilities for rural Karnataka
3. Facilitating experience of the S&T benefits first hand in daily lives of people
4. Coordinating the extraordinary Institutional and Human capital in the State

5. Enabling leadership role for the State in Science including research publications and public goods
6. Establishing STI-based novel Enterprises and Partnerships
7. Building Interdisciplinary Consortia and Networks
8. Policy prescriptions for enhancing Investments, both Public and Corporate

Focus

In order to accomplish the objective of 'Science-Technology-Innovation for Societal benefit', the KSTA would focus on the following:

1. Inculcating scientific temper across civil society through science communication, particularly in Kannada
2. Facilitating technology dissemination through Academia-Farm-Industry interface, with a focus on rural areas
3. Fostering Innovations & Entrepreneurship for Societal benefit
4. Recognising talents and contributions through Awards
5. Organising Conferences & Outreach programmes
6. Serving as Resource Centre for Capacity building in frontier areas of Science & Technology
7. Acting as Science, Technology & Innovation Policy Advisory Body for the State

Strategy

The key areas of S&T interventions relevant to the State are Agriculture, Health, Industry, Education, Communication, Transportation and related fields. Innovations, Inputs and

Investments in these sectors would have a multiplier effect, as for example, IT/BT industry in the State, Space research efforts, Education where the State is a major destination for students from other states as well as countries. R&D being the engine for idea generation and application, a continuous effort would be made to provide policy imperatives to both the government and the corporates. It is at the same time essential that these are contextualised in the cultural ethos of the State for due ownership and growth. This is where the communication and stakeholder participation become critical.

The challenges and the corresponding actions of the KSTA are:

1. Mapping Science literacy in Karnataka vis-à-vis Educational literacy
2. Cross sectoral learning; effective Academia-Industry interactions
3. Science Communication and Excellence in Science
4. Harnessing the innate strengths of the Institutions, through a Consortia approach
5. Enabling greater hands on Science experience for Students as well as Public through Regional workshops and Interaction meets
6. Women Empowerment and development of Backward Regions of Karnataka through S&T tools
7. Concepts combining Basic & Applied sciences with New sciences as also Folk science
8. Recognising informal Innovations, with a way forward for livelihoods

9. Establishing an ecosystem of Innovation and Entrepreneurship
10. Enhancing public engagement with Science and increasing public access to Science through effective Science communication in Kannada, and English as required
11. Impact assessment studies on S&T investments and returns, towards enhancing investments
12. Training youth brigades and mentors at District level for Science awareness
13. Capacity development at various levels, including Leadership
14. Science and Technology for an empowered Karnataka

Action Plan

In order to address the above aspects, the action plan is as follows:

1. Establish platforms, both physical and virtual, for STI Networking Individuals, of Karnataka origin, located anywhere in the world, and Institutions in the State
2. Centre of Excellence in areas of Science literacy and Communication; GIS applications; Environmental Impact Assessment & Management; Intellectual Property Management; Project management
3. Advanced Centre for Content Generation and Production of Science videos in Kannada
4. R&D and Mentoring Centre for Professional Development, with short term training and PG programmes in frontier areas, with national and international partnerships

5. Incubator for Science-led Enterprises and Tech-based Rural Entrepreneurship
6. Centre for Foresighting, Innovation and Public Policy in STI
7. Repository of STI efforts in Karnataka, including Individuals and Institutions, both Public and Corporate
8. Centre for Science Talent recognition and Publications in the State
9. Ministry of Human Resource Development 2020, National Education Policy, 65pp.

Epilogue

Appreciating the STI as a dynamic and continuously evolving paradigm, it is necessary that both the content and delivery are revisited, to both update and assimilate the accomplishments and challenges on a regular basis. While the stakeholder domain is the entire State, there are multiple players in terms of Institutions and Agencies even within the S&T framework that need to be actively involved and effectively networked for harnessing the potentials. Convergence and synthesis of humongous efforts in the State for reaching the youth in a meaningful way, are the roles envisaged in the coming decade. To become a true knowledge economy encompassing all sectors of economy, with due inclusivity and emphasis on scientific temper and entrepreneurship, the Karnataka Science and Technology Academy would become the Apex Body in the State, for enabling 'Science & Technology for an Empowered Karnataka'.

Selected References

- Indian National Science Academy, 2010. A Draft Vision Document for Indian Science, INSA, New Delhi, 15 pp.
- Ministry of Science and Technology, Government of India, 2013. Science, Technology and Innovation Policy, 2013, 16 pp.
- Office of the Chief Scientist 2013, Science, Technology, Engineering and Mathematics in the National Interest: A Strategic Approach, Australian Government, Canberra, 36 pp.
- Innovation and Science Australia 2017, Australia2030: prosperity through innovation, Australian Government, Canberra, 125 pp.
- Department of Higher Education, MHRD, GoI, 2019. All India Survey on Higher Education, 2018-19. 310 pp.
- Department of Science and Technology, MoST, GoI, 2020. S&T Indicators Tables: Research and Development Statistics, 2019-20, 62 pp.
- Planning, Programme Monitoring and Statistics Department, Government of Karnataka, 2020. Economic Survey of Karnataka, 2019-20, 966 pp.
- Ministry of Human Resource Development, 2020. National Education Policy, 66 pp.

Karnataka Science and Technology Academy
College of Horticulture Entrance, GKVK Campus
Major Sandeep Unnikrishnan Road
Vidyaranyapura Post, Bengaluru 560097
Tel: 080-2972 1550; Email: ksta.gok@gmail.com
Website: www.kstacademy.in