

CSIR@80: Vision & Strategy 2022



Science

Strive for global scientific impact

Technology

Catalyse innovation-driven industry

Human Resource

Nurture transdisciplinary leadership

Empowerment

Enable inclusive economic development

New CSIR for New India

2011



CSIR@80: Vision & Strategy 2022

This vision has been developed through the involvement of stakeholders and scientists across CSIR under young leadership

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Reinventing CSIR: The Motivation

The Indian civilisation is one of the oldest in the world. The country has a glorious cultural, educational, scientific and technological heritage. However foundation for the present and modern India was laid only after its independence in August 1947. The year 2022 brings us to India@75, the platinum jubilee of Indian independence. Interestingly, India@75 coincides with CSIR@80.

The worldwide expectation that by this time, India would have become the third most economically powerful country in the world, changing its image as a third world country.

As India's largest and most diverse S&T institution, CSIR's aspiration is to lead India in achieving this goal.

When India fulfils the dream of becoming an advanced nation with a developed economy, CSIR@80 should position itself as an international leader in niche areas of science, technology and innovation.

It is in this context that CSIR embarks on a mission to define its vision for 2022 with a seamless connectivity from science to technology to innovation as its motivating inspiration.

*With my best wishes,
Mamta Singh*



"The scope of work in each laboratory (of CSIR) could perhaps be best described to be of the form of a continuous spectrum, at one end of which research work of the purest academic type and of the highest quality is carried out and at the other, the technical development of processes and equipment proceeds by stages".

Sir Shanti Swarup Bhatnagar
DG, CSIR, Nature, 1947

CSIR Mission and Vision

CSIR's renewed mission is inspired by the remarks made by the President of the CSIR Society to CSIR to build "... the new CSIR that will fulfil the aspirations of modern India ...".

So CSIR's mission is simply – to build a new CSIR for a new India.

CSIR's Vision:

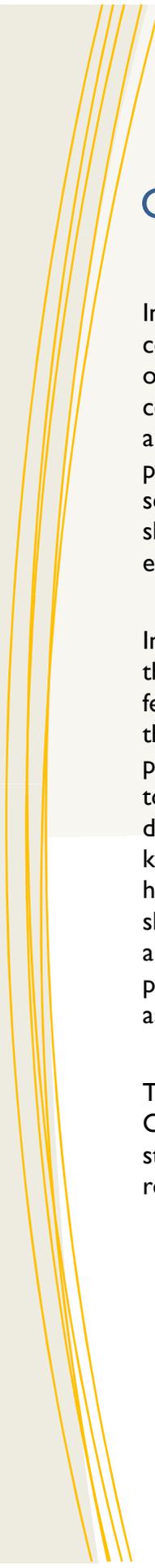
“Pursue science which strives for global impact, technology that enables innovation-driven industry and nurture trans-disciplinary leadership thereby catalysing inclusive economic development for the people of India”

The people and nation-centric thrust to science, technology and societal pursuits remains the cornerstone of CSIR's mission. In view of rising dreams and aspirations of the nation, its expectation from CSIR and the other public funded institutions is ever increasing. Not only are the pace of scientific and technological growth and the aspirations of higher living standards evident today but also many age old myths of economy and growth have been broken; e.g., the shift from manufacturing to services; capital resources to knowledge resources; population as a burden to human resource as an asset; national needs to international opportunities and so on. The changed scenario has inspired CSIR towards:

- Science & engineering leadership;
- Innovative technology solutions;
- Open innovation and crowd sourcing;
- Nurturing talent in transdisciplinary areas;
- Science based entrepreneurship; and
- Socio-economic transformation through S&T intervention.

“CSIR is 65 years old and was built by Dr. Bhatnagar to meet the challenges of that time. I would like you to build the new CSIR that will fulfil the aspirations of modern India.”

***Hon'ble Prime Minister and President, CSIR to DG, CSIR on
14th November 2007***



Context and Content

In these times of rapid change, CSIR should reinvent itself completely. CSIR should seek to be measured by outcomes rather than outputs that are based on the conventional S&T metrics such as publications, citations and patents. On one hand, CSIR should strive to bring pride to India by attaining global scientific leadership in select areas of strength and on the other hand CSIR should bring prosperity to India, where the aspirations of every Indian is fulfilled.

Indeed, CSIR's dreams should reflect the aspirations of the billion plus people of the country, to reach where few organization has attempted to reach. Realization of these dreams can neither be by extrapolation of the present trends nor by conventional strategies; they have to be realized by moving to a different plane having different axes; a plane defined by human resources and knowledge rather than material resources and scientific hierarchy. As India grows in the coming decades, CSIR should engage its entire prowess in science, technology and innovation for achieving development, while protecting the planet. Indeed CSIR should have an aspiration to lead in this Indian decade of innovation.

This document articulates CSIR's vision for 2022 i.e. CSIR@80, in this context. This also attempts to set the strategic shift in planning and the roadmap required to realistically achieve this vision.

CSIR Today

CSIR has played a pivotal role in partnering and strengthening Indian industry in the fields of: Aerospace, agrochemicals, petroleum and petro-chemicals, chemical intermediates, polymers, glass and ceramics, mining, minerals and metals, coal, building materials, surface engineering, food processing, aromatic plants and healthcare products.

CSIR is the technology leader in the areas of: Generic drugs, industrial catalysts and leather technology.

CSIR plays a pivotal role in the Indian strategic sector in handling their challenge of technology denial by providing products: Products ranging from radiation shielding glass to microwave tube and from head-up display to advanced carbon composites based products.

CSIR provides S&T based services to industry and other stakeholders like: Environmental impact assessment and mitigation; testing of structures; aerospace and defence; structural engineering related interventions; urban and rural road and housing development; power industries; and food technology.

CSIR acts as custodian for: Primary standards of measurements; bio-resources, and traditional knowledge.

CSIR is the nation's flag bearer in: Intellectual Property generation and protection.

CSIR builds the country's largest S&T human resource: This is through research grants, fellowships, awards, post graduates in niche areas and Ph.Ds in science and engineering.

Strategies

Science & engineering leadership

- Leverage knowledge & core strengths
- Transform old and create new connected institutions
- Establish hubs of scientific excellence
- Attract the best minds
- Mentor young researchers
- Benchmark internationally
- Network and source globally

Innovative technology solutions

- Thrust on transdisciplinary science and engineering
- More science in engineering & more engineering in science
- Fluid networked organization structure
- Identify & implement select mission mode projects
- Professional project management
- Create publicly owned and professionally managed facilities
- Run the last mile alongside industry with enthusiasm and energy

Open innovation and crowd sourcing

- Create and harness open source platforms
- Connect with students across the country
- Distributed co-creation of technologies
- Produce public good on the web
- Involve stakeholders including NGOs & social entrepreneurs

Nurturing talent in trans-disciplinary areas

- Grooming young minds (AcSIR)
- Emphasis on research based education
- Create fellowships in transdisciplinary areas
- Enhance funding for transdisciplinary research
- Create joint positions across laboratories, universities and indeed across geographies

Science based entrepreneurship

- Facilitate start-up/spin-off companies using knowledge as equity
- Enable Micro, Small and Medium Enterprises (MSMEs)
by being their knowledge partner and provider

Socio-economic transformation through S&T intervention

- Participative technology dissemination
- Participatory enterprise development
- Information and communication technologies for wider reach

Aligning CSIR@80 with India@75

R&D Focus and Priorities

The key driver for R&D focus of CSIR will be national goals. Natural resource & knowledge-base of the country, geographical and demographical advantages, energy conservation, environment friendliness, sustainability and CSIR competence will steer the direction of research. The broad areas of focus will be:

- Affordable healthcare;
- Agri-food technologies;
- Sustainable energy;
- Chemistry and environment;
- Smart & functional materials;
- Engineering Structures/Design & Electronics;
- Civil aviation;
- Climate change & Earth System Sciences; and
- CSIR-800.

National mission oriented projects with quantified economic, social, environmental and other intangible benefits targeting 2022 will be enunciated and taken up. The selection and evaluation of the projects in all of these areas will be guided by the criteria of future leadership opportunity, relevance, risk, reasonableness and return.

National Aspirations* for India@75

- Sustainable energy mission for robust growth
- Affordable healthcare for all
- An entrepreneur centric country
- Highest S&T output per dollar of investment
- A food surplus nation
- Nutrition level higher than global average
- Potable water for all
- Natural disaster mitigation
- Uncompromising security
- Protection of Traditional Knowledge and Biodiversity

**As perceived by CSIR for S&T intervention*

CSIR's Approach for CSIR@80

- New & renewable energy programmes
- Open innovation for affordable healthcare
- Open source solar energy mission
- Employment opportunities by catalyzing innovation ecosystem
- Creation of MSMEs and value addition through CSIR technologies
- S&T innovation & patenting at low cost
- Sustainable materials & development
- Strategic technologies for civilian use
- Enhancing plant productivity
- Nutraceuticals and functional foods
- Water resource mapping & recycling
- Technology support to disaster management
- Strategic partnership with defence, space and nuclear programs
- Leads from Indian traditional medicine and marine sciences

CSIR draws its inspiration and lessons from its past journey.

“— how to combine that past with the present and the future, how to have changes and how to have continuity and how to have both together.”

Pt. Jawaharlal Nehru

Hon'ble Prime Minister and President, CSIR
Inauguration of CSIR-NML, 26th November 1950

Building Strategies, Breaking Barriers

People Centric Reforms

Nurturing people: Synergizing individual's goals with Institutional growth and organizational aspirations and nation's ambitions.

Academy of Scientific and Innovative Research as a vehicle to transform CSIR's knowledgebase.

Research groups of excellence around individuals.

Mobility of scientists across research institutions, academic institutes, universities and industries.

Performance evaluation of teams rather than individuals:

Individual to collective accountability.

Energising system: Performance, relevance and impact based incentives.

Organisational Restructuring

Creating large Government owned and professionally managed facilities.

Creating virtual laboratories and networked organizations.

Building transdisciplinary institutions/centres.

R&D in co-ownership mode: creating focus interfaces, CSIR-Industry & CSIR-people.

Seamless organization: flexibility, freedom and creative environment.

Knowledge as equity: create or promote CSIR knowledge based companies.

Sharing of laboratories: our assets to nation's assets.

Building Leadership

- From pyramidal to matrix structure
- Global sourcing of potential leaders
- Empowering young leadership
- Grooming through leadership development programs
- Creating CSIR science management cadre

Powering CSIR through empowered youth

Building Partnerships, Extending Outreach

Open source discovery projects – Open source project management for key technology development modules.

CSIR's stake holding in science and knowledge based industries.

CSIR International Centres.

Global leadership in niche technologies

through Public-Private Partnerships.

CSIR technologies to entrepreneurs - CSIR Tech enabled.

CSIR knowledge enterprises – CSIR Venture Centres.

CSIR-National Innovation Foundation (NIF) Partnership

to promote grassroots innovation.

CSIR –National Institute of Design (NID) Idea Centre.

CSIR and other national agencies joint initiatives.

Outreach centres in number of districts in states across India.



Measuring Performance, Relevance and Impact

CSIR would continue to contribute to public, private, strategic and societal goods. Performance indices have to be viewed in the context of relevance of the efforts and impact made. The measurement of performance has to be output and outcome driven.

Performance Parameters

Technological performance: Technologies developed & transferred; economic impact generated; royalty earned; spin off companies created; equity holding in companies; reduced environmental footprint.

IP generation: Indian and foreign patents (filed, granted and licensed); IP portfolios created.

Scientific Output: New research domains created; SCI publications; Impact of research; citations etc.

Strategic Challenges Met: Technologies; solutions provided.

Societal Impact: Jobs created; human resource developed; number of people benefitted.

Recognitions: National and International awards; prestigious fellowships of academies; membership of editorial boards etc.

Relevance Parameters

National mission projects undertaken.

Societal aspirations fulfilled.

Strategic goals addressed.

Stakeholder (industries) demands met.

Quality human resource generated.

Outreach.

Performance Targets for CSIR@80

Strive for global scientific impact

Create five new research domains.

International network with CSIR campuses in other nations of Africa and Asia.

One exceptional publication of global impact every month.

Catalyse innovation driven industry

Continue to maintain the largest patent portfolio in the Country.

Transfer 10 major cutting edge technologies a year for development/commercialization.

One game changing technology solution a year that impacts the lives of millions.

50 spin-off companies.

Nurturing human resource and transdisciplinary leadership

1200 Ph.D. students and 2000 post graduates every year.

Creation of 12 Innovation Complexes.

Enable inclusive economic development

One million people per year to benefit from CSIR 800 projects.

Catalyse inclusive innovation to benefit over 250,000 MSMEs.

The Roadmap for Achieving CSIR@80 Vision

A paradigm shift

From incremental to a disruptive thought leadership.
From mere projects to creating end products in the market place.
From a follower to a leader.
From research for publication to publications from research.
From supporting companies to creating companies.
From physical institutes to connected institutes.
From collaboration to co-creation.
From individual centric to team centric.



Key Mantras of CSIR@80

Nation centric

Knowledge intensive

Innovation driven

In partnership

Globally benchmarked

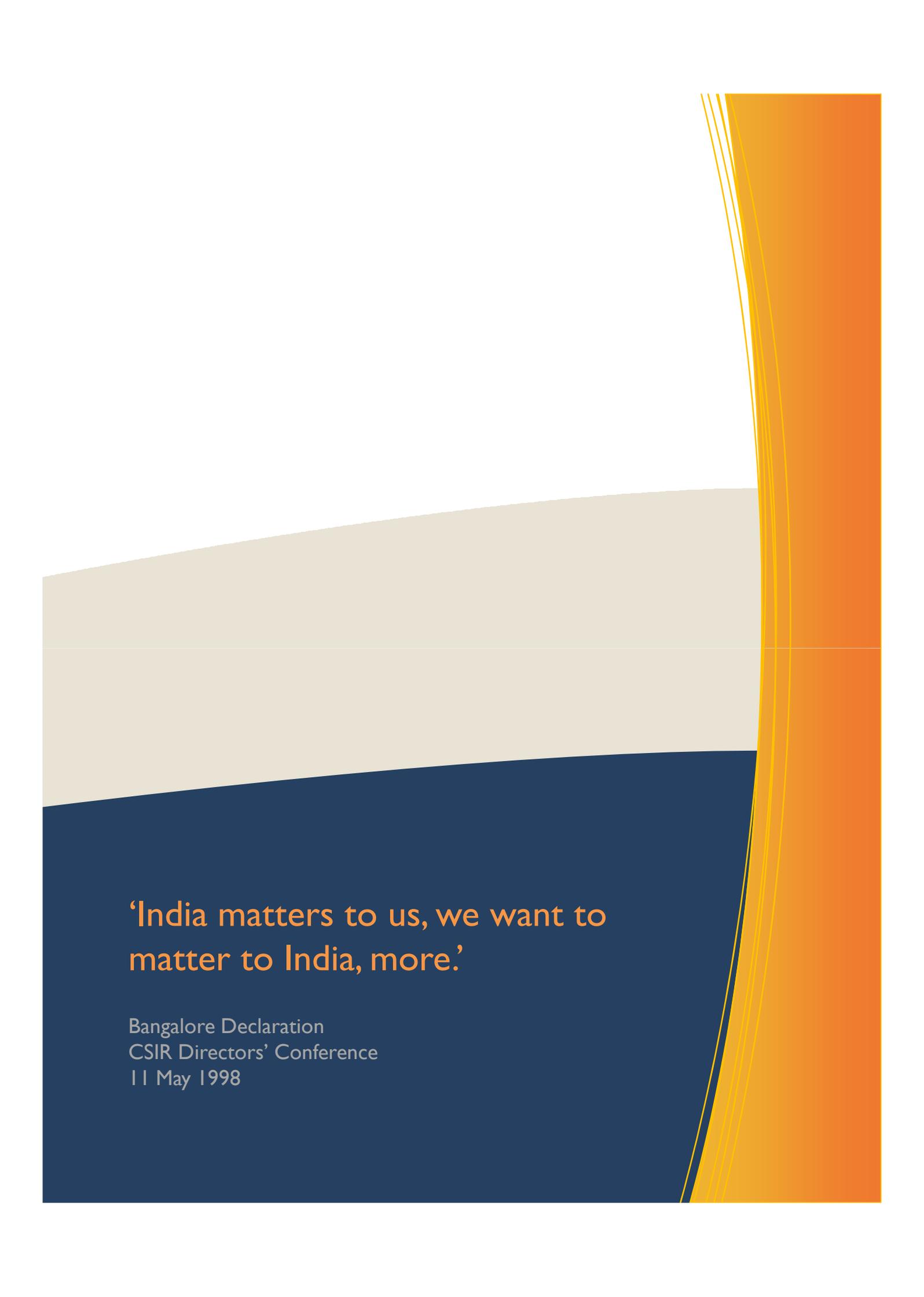
Inclusion focussed

Values and ethos based

One CSIR

“Stand up, be bold, be strong. Take the whole responsibility on your own shoulders, and know that you are the creator of your own destiny”.

Swami Vivekananda



**‘India matters to us, we want to
matter to India, more.’**

Bangalore Declaration
CSIR Directors’ Conference
11 May 1998