

SRDB STRATEGIC WORK PLAN 2023 – 2028

Foreword:

SRDB has brought forward the development and implementation of a “Strategic Plan” so as to sharpen our focus on enhancing organizational performance and to set a targeted, innovative and impact- driven research agenda that will enable SRDB to continue to deliver value for stake holders of sugar industry in Punjab.

This new Strategic Plan for 2023 to 2028 shapes the future direction of SRDB. In setting this new direction, we have made it very to deliver a research portfolio that will have demonstrable and transformational impact on the profitability and resilience of the sugarcane industry.

The bottom line is our grower and miller, this Strategic Plan responds to these needs and expectations accordingly. SRDB Strategic Plan also aligns with the R&D strategy, research priorities for the sugarcane industry.

To ensure we never lose focus on our sugar industry expectations, we have introduced four overarching goals to drive our research agenda over the next five years. *These goals are listed below:*

Drive Profitability:

- Through innovation-led productivity gains, step-change and value-adding.

Improve Sustainability

- Through evidence-based research and sustainable production biosecurity and environmental management at each level mainly through extensive varietal development program.

Enhance Capability:

- Through strengthened research and industry partnerships, capacity development programs (trainings) and collaborative knowledge transfer and adoption mechanism.

Strengthen organizational excellence:

- Through enhanced R&D investment management, best practice organizational governance and positive performance-focused organizational culture.

To support delivery of these goals, SRDB has redefined its key focus areas (KFAs) for R&D and introduced an outcome-focused program structure to better align activities, resources and knowledge exchange within our R&D portfolio. Our R&D portfolio over the coming years clearly reflects what a diverse range of programs addressing the critical research needs for Sugarcane growers and millers.

This includes particular attention and investment in the following RD&A activities.

Streamlining of SRDB’s core breeding operations to improve efficiency of selection and the quality of new varieties, with new molecular marker selection and targeted introgression

Enhancing soil health, nutrient management and climate variability forecasting to improve industry decision support-tools and minimize environmental impacts

Tackling adoption and communication problems head-on, by working in unison with our growers, millers and the advisory sector to implement a new strategy to galvanize the promotion of research knowledge and actively encourage adoption of new technology and practices that make a real difference

Quantifying and demonstrating the impact of harvesting best practices to improve production efficiencies and profitability across the sugarcane industry value chain.

Continuing effort to identify causal factor(s) and management strategies for Red Rot, Pyrrilla, White Fly and Borers Complex to limit impacts on productivity and profitability

Collaborating with other researchers and private sector organizations on transformative and disruptive technologies to drive industry profitability and sustainability

Innovating by facilitating novel long-term blue-sky research that may transform the future.

In delivering on this Strategic Plan, SRDB will balance the immediate needs of growers and millers against the need for long-term innovation and strategic basic research to deliver step-change for the industry. To do this, we will integrate and leverage both conventional and disruptive technologies, providing opportunities for more effective use of resources and inputs, increased profitability, improved decision-making and enhanced sustainability.

Over the course of the next five years, we will continue to consult with and listen to our investors, understand their needs and respond to these needs through innovative R and D solutions that are successfully adopted. In doing so, we will add value to the Pakistani sugarcane industry, not just in terms of profitability but also in terms of contributing to economic growth, environmental stewardship and social prosperity in regional Pakistani communities. We will review our Strategic Plan annually and amend it where necessary to reflect shifting challenges and research focus.

SRDB Long Term Work Plan Summary

Our Goals	Drive Profitability	Improve Sustainability	Enhance Capability	Strengthen Organizational excellence
Our Key focus areas	Outcomes		Priorities/programs	
<i>Optimally adapted varieties, plant breeding and release</i>	Increased sugarcane yield and sugar recovery % cane		Restructure and modernize the breeding program and broaden the genetic base.	
<i>Soil health, nutrient & residue management and environmental sustainability</i>	Better soil health, higher nutrient use efficiency and improved water quality		Integrated and focused soil health through enhanced template-based fertilizer management program	
<i>Pest, disease and weed management</i>	Reduced or avoided yield loss and/or added input costs		New integrated precision technologies and activities on a cost/benefits basis	
<i>Farming systems and harvesting</i>	Improved farm input output efficiencies and profitability		Economic analyses and demonstration of new or improved technology, farm management practices and analysis tools.	
<i>Product diversification and value addition</i>	Diversified revenue streams and product innovation		Priorities diversification opportunities for further R&D activity or market analysis	
<i>Knowledge and technology transfer and adoption</i>	Accelerated adoption of new technology and practice change		New strategy targeting industry needs problems and solutions	
<i>Collaboration and capability development</i>	Enhanced industry and research capability and capacity		Research partnerships and enhanced human capability programs	
<i>Organizational effectiveness</i>	Increased investor satisfaction and returns on investment		Embedded investor and performance-centric culture	

SRDB Enablers	Mapping the future	Sustaining financial viability	Partnering for impact
	Innovating our science	Optimizing return on investment	Transforming our culture

SRDB Measure of success	Increased profitability/ton of sugar produced	Improved Sugarcane sustainability	High impact return on investment
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SRDB values	Innovation	Stake holders satisfaction	Accountability	Teamwork
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SRDB ROLE:

SRDB was established in 2014 with Executive Order of Chief Minister Punjab to promote, strengthen, support and facilitate research and development activities at industry level in Punjab.

The core responsibilities of SRDB are to:

Deliver cost-effective research and development (R&D) services to the Pakistani sugarcane industry to enhance its viability, competitiveness and sustainability

Carry-out, coordinate and provide investment for R&D activities in relation to the Pakistani sugarcane industry

Facilitate the dissemination, extension, adoption and commercialization of the results of R&D activities; and

Support and develop industry research capacity

SRDB activities are funded through 10 percent of CESS FUND from sugarcane growers and millers, that encourages sugarcane researchers, and research organizations from the broader research community and other sectors, to create innovative solutions to address sugarcane industry challenges and opportunities. SRDB also undertakes core research activities that are crucial to the future of sugarcane industry, including import/exchanger of germplasm, projects and training.

Operating environment

The Pakistani sugarcane industry operates in a dynamic world market with political, economic, social, technological, legislative and environmental factors continually evolving and impacting sugarcane production.

An assessment of these macro and micro factors and their associated current and potential influences on RD&A was undertaken in the development of this Strategic Work Plan, with the following key trends and drivers being identified

Sugarcane Production

- Slow pace increase in Pakistan's annual sugarcane production over recent years, however, production is expected to decline upcoming years due to climate change in Pakistan and the impact of Floods in South Punjab and Sindh region. R&D to support production growth and mitigate impact from extreme weather events is critical for securing industry profitability and resilience through advisory zoning of sugarcane varieties.

Production Costs

- Escalation of energy, water and materials' costs is impacting profit margins and eroding profits due to costlier inputs, driving slow improvements in efficiency and productivity.

Productivity

- Low growth in Pakistani cane and sugar yields over the last decade coupled with incremental gains in efficiency becoming harder to achieve is driving the need for transformational change in plant breeding and farm production systems.

Collaboration

- Growing pressure on available resources and investment funds is driving increased collaboration with industry, researchers, government and private sector to leverage multi-disciplinary and multi-institutional resources and capability and accelerate the rate of innovation.

Climate Change

- Climatic variability and extreme weather events are driving increased R&D investment to better understand, forecast and use climatic information in sugarcane production and management of off-site movement of nutrients and chemicals.

Environment

- Focus on reducing farming impact on water quality and nutrient run-off in adoption of best practice sustainable farming systems and accountability in environmental management.
- Trend towards renewable energy, waste minimization, carbon sequestration and environmentally friendly chemical usage is driving innovation in technology and production processes, on-farm and at-mill.
- Expansion of sugarcane production in marginal soils is driving development of soil health tools and farming practices to improve soil condition and productivity.

New Scientific Practices and disruptive technology

- Disruptive ‘big data’, sensors and smart connected technologies are driving innovation in data analysis and decision-support tools.
- ‘Game changing’ robotics, automation, drones, sensors and global positioning systems (GPS), NIR, are redefining digitalized sugarcane crop production systems.
- Biotechnology advancing application of omics and transgenic/GM technology are helping to improve sugarcane varieties.
- Increasing investment in strategic basic research is enhancing opportunities to solve fundamental issues and drive transformational change.
- Enhancing knowledge, skills and capacity to use advanced technology is critically important for accelerating uptake and optimizing the potential of the technology.

Diversification

- Increasing scope for the sugarcane industry to be a major source of sustainable feed stocks for animal nutrition, bioenergy, chemicals, bio-polymers, pharmaceuticals and other value-add products.
- Major bio refinery and cogeneration infrastructure projects are expected to be developed and operational over the next few years and cogeneration Industry support for broad-scale diversification is not however widespread with short to medium-term economic viability.

Extension and adoption

- Sugarcane industry extension delivery is fragmented resulting in an urgent need for a cohesive industry-agreed adoption strategy and implementation mechanisms to improved transfer of technologies and practice change

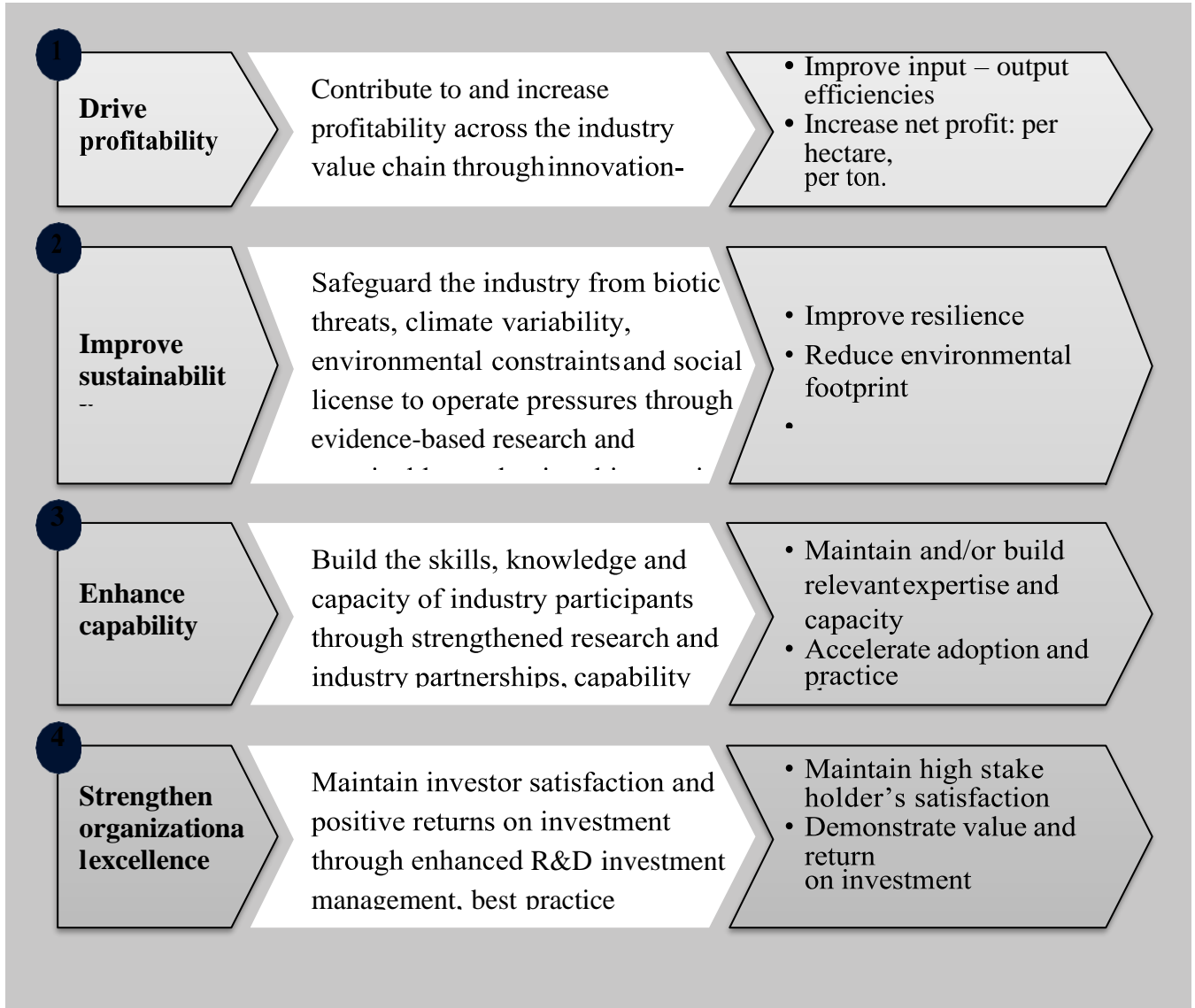
SRDB Strategic Agenda

SRDB has established a strategic agenda that responds to the challenges, opportunities and investor priorities identified during the development of this plan.

SRDB strategy has been reframed to more clearly articulate that our primary function is to invest in impactful evidence-based R&D to underpin the profitability and resilience of sugarcane industry.

SRDB has proposed four overarching goals and refined Key Focused Areas (KFAs) with R&D programs to provide further clarity in purpose and alignment with investor priorities. The goals reflect SRDB’s strong contribution to outcomes.

SRDB GOALS:



SRDB Proposed Key Focus Areas, R&D Programs

SRDB Key Focus Areas	SRDB R&D Program
Optimally adapted varieties plant breeding and release	<ul style="list-style-type: none"> • Plant genetics/selection: improve breeding systems for genetic gain and delivery of new varieties through use of new molecular marker technology. • Physiology and trait development; improve varieties for specific traits • Diagnostic: Improve or develop diagnostic technologies for genetic screening.
Soil health, nutrient & residue management and environmental sustainability	<ul style="list-style-type: none"> • Soil health: improve soil biology, chemical and physical attributes. • Nutrient & residue management: decrease environmental footprint. • Climate variability and forecasting: improve capability to predict and adapt to variable climatic conditions.
Pest, disease and weed management	<ul style="list-style-type: none"> • Biosecurity: enhance capacity to manage biosecurity risks. • Pest control: enhance capacity to deal with pests. • Disease management: improve disease management strategies and technologies. • Weed management: improve weed management strategies and technologies.
Farming system and harvesting	<ul style="list-style-type: none"> • Precision agriculture (PA): improve water management: improve irrigation and water management. • Farming systems: improve planting systems; crop performance; crop rotations; and on-farm energy efficiency. <p>Harvesting systems and cane cleaning: improve technology and identify and demonstrate harvesting best practice</p>
Product Diversification and value addition	<p>Enhancing value: identification and implementation of new opportunities for new products or uses for sugarcane</p>
Knowledge and technology transfer and adoption	<ul style="list-style-type: none"> • Knowledge transfer and adoption: establish a contemporary strategy and regionally-based partnerships to promote awareness and uptake of new research knowledge and technology (trainings). <p>Business performance: improve farm business and risk management decision making</p>
Collaboration and capability development	<ul style="list-style-type: none"> • Sectoral and cross-sectoral collaboration (academia, research & industry). • Scholarships: enhance research capacity through recognized training. • Sugarcane Industry Travel and Learning Awards (STLA): travel and learning to enhance innovation capacity. <p>Training to enhance qualifications and skills: workshops; Early Career Researcher (ECR)/Mid-Career Researcher (MCR) Awards; and leadership.</p>

SRDB Plan

The R&D Plan maps out for each key focus, priorities, programs, outputs, short- and longer-term outcomes and impacts contributing to our goals. Our Annual Operational Plans will further outline the key deliverables, project portfolio and financial forecasts for delivering on our Strategic Plan.

SRDB role is to create value by bringing innovative technology and practices to the industry and facilitating the uptake of these innovations. It is up to the sugarcane growers and millers and other stakeholders in the industry value chain to embrace and adopt research innovation so that the industry as a whole can deliver the step-change improvements necessary to secure industry profitability growth and resilience.

Enabling Strategies:

Delivery of our Strategic Plan will be supported through a suite of enabling strategies that will ensure we get the greatest impact from our R&D investment. Consideration of the following critical success areas will be taken in to account when developing and implementing our enabling strategies:

- Mapping the future – working with industry representative bodies to convene a Futures Forum to undertake long-range scenario planning, vision setting and strategic targets;
- Sustaining financial viability – leveraging co-investment, commercialization opportunities and accelerating returns from investment;
- Partnering for impact – collaborating with others to optimize R&D outcomes;
- Innovating the way, we conduct science – application of new ‘game-changing’ scientific tools and techniques;

SRDB Approach

SRDB’s portfolio comprises both core and contestable R&D, include plant breeding, biosecurity and adoption activities cover KFAs. SRDB’s to ensure transparent, independent and robust review of all investment funds. Research projects designed to assess the magnitude of potential benefits, taking into account the likely adoption of the project outcomes or innovations and the prospects of the project delivering them (Feasibility). Attractiveness is assessed using an input-output-outcome-impact analysis of the project proposals, whilst Feasibility is assessed by considering research risk and quality, using peer assessment and expertise.

Collaborations

SRDB recognizes the importance of collaborating with a range of partners to improve the efficiency, coordination and leveraging of research investment in areas of mutual interest and where beneficial for the sugarcane industry. SRDB will work in partnership with leading Pakistani organizations such as the NIBGE, NIAB, CEMB, UAF, AARI, PARC and HEC, universities, government and other industry groups such as regional productivity services, growers, millers, and natural resource management organizations. We also partner with the private sector (both within Pakistan and internationally) and international sugarcane breeding and research organizations like ARS-USDA, USA, UFSCar Brazil, Guangxi Univ. China, MSIRI Mauritius, SRA Pakistan and SRI Sri Lanka, to create collaborative research opportunities and variety exchange programs that will

benefit the Pakistani sugarcane industry. SRDB strategic partnerships and joint investment in advanced technologies and agricultural practices will continue to be an important part of our investment strategy going forward. In particular, SRDB will seek to expand and strengthen relationships and collaborative alliances with:

- Sugarcane research counterparts overseas, especially with research institutes in USA, Pakistan, China and Brazil;
- Private sector partnerships to catalyze the development and commercialization of cutting-edge technology and research outputs;
- Productivity services organizations to accelerate up-take of research outcomes and new technology; and
- Knowledge sharing and learning and in co-investment in cross-sectoral research program.

A further priority in this planning period will be collaborating with industry and research providers on the implementation of the Strategy, which will continue to play a leading role in the governance, development and management of the Strategy.

Our Performance

Monitoring and Evaluation Framework

SRDB has established an “impact pathway” framework to support performance monitoring and evaluation across its R&D portfolio. This program logic-based model traces research inputs through to outputs, outcomes and ultimately, industry impacts. Such line-of-sight allows SRDB to improve the monitoring, evaluation and reporting of SRDB’s portfolio and provides pathways towards quantifying attributable impact and return.

The Core Measures of success for SRDB, “Increased profitability for growers and millers and improved industry sustainability”. SRDB is currently implementing data collection and monitoring processes and tools to specifically measure and track (over the short, medium and long-term) adoption of new technology, practice change and the impact and/or economic value created through the application of our research. As this performance data becomes available, it will be incorporated into SRDB’s KPIs and reporting. The primary monitoring, evaluation and reporting mechanisms within SRDB’s Framework include:

- Project Themes, milestone outcomes reporting to the Board and Operational (technical, financial, and risk management) and strategic reporting to the EC-SRDB and BOG of the Board
- Six-monthly exception reporting to the Board on progress against the Strategic Plan and Reports on performance of Funds and Projects to the Board.
- Project and program evaluations, including impact and cost-benefit analyses and Independent Performance Reviews, as required by the Board.

SRDB will regularly communicate with stakeholders on strategic and operational performance and use feedback on performance to enhance the quality of research and development processes, programs and activities.

SRDB’s KFAs to Stake Holder’s Priorities KEY FOCUSED AREAS

<i>Stakeholder Priorities</i>	<i>Plant breeding, Varieties and release</i>	<i>Soil health, nutrient management & environmental sustainability</i>	<i>Pest, disease and weed management</i>	<i>Product diversification and Value Addition</i>	<i>Knowledge, technology transfer and adoption</i>
<i>Productivity: Gains in cane/sugar Yield</i>					
<i>Human Resource</i>					
<i>Soil health, plant protection and water</i>					
<i>Mechanization</i>					
<i>Climate change</i>					
<i>Seed Bank</i>					
<i>Adoption of R and D</i>					
<i>Farming System Mix Crop</i>					
<i>Digitalized Sugarcane Crop</i>					