



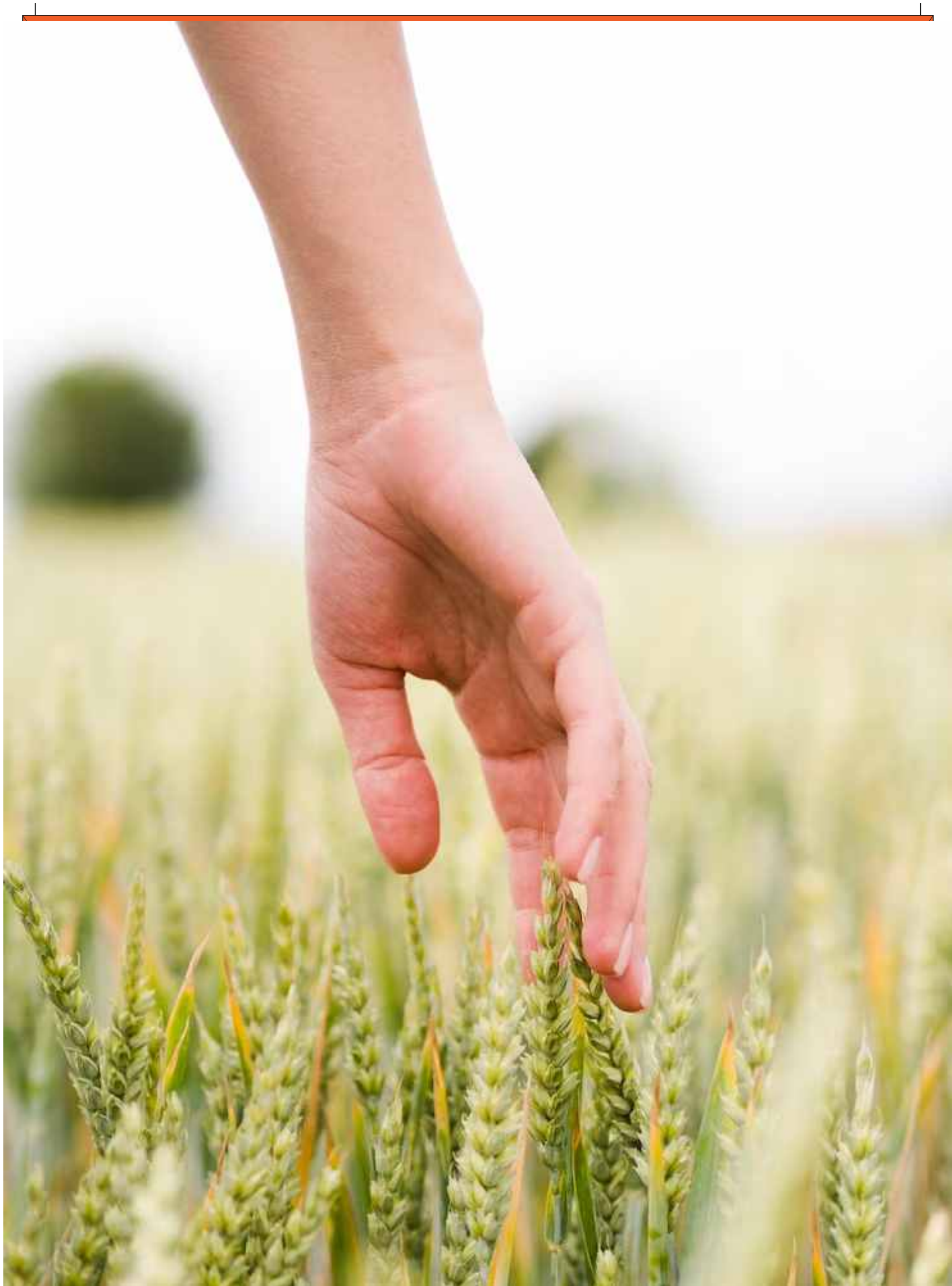
The Global Language of Business



# LEVERAGING QR CODE TO TRANSFORM THE AGRI-INPUT SUPPLY CHAIN

WHITEPAPER

SEPTEMBER 2023



# Table Of Content



Executive Summary	02
Agri-input industry in India: Background	03
Major reforms in agri-input sector	06
Digital innovations driving forward the agri-input industry in India	08
Challenges faced by agri-input industry	09
Significant role of Global Standards in improving India's agri-input sector	12
Success stories of GS1 Standards implementation	16
Case Study	18
Conclusion	23

## EXECUTIVE SUMMARY

In an era marked by rapid technological advancements and evolving consumer demands, the agricultural industry finds itself at the crossroads of transformation. As the global population continues to grow, the need for sustainable and efficient agricultural practices becomes paramount. The agri-input sector, comprising seeds, pesticides, and fertilizers, plays a pivotal role in shaping the future of agriculture.

This comprehensive report delves into the intricate landscape of India's agri-input industry, exploring its potential for economic growth, the challenges it faces, and the innovative solutions that are driving positive change. From the fertile fields to the final consumer, this report takes us on a journey through the supply chain, highlighting the critical importance of traceability, transparency, and quality assurance.

The Government of India's proactive approach to double the farmer's income and its commitment to implement the reforms are noteworthy. Through a series of initiatives and policy changes, the government is fostering an environment conducive to sustainable growth in the agricultural sector. The report sheds light on these initiatives and examines their impact on enhancing the quality, transparency, and traceability of agri-input products.

Amidst the challenges of counterfeit proliferation, pilferage, and supply chain inefficiencies, the report underscores the significance of GS1 standards. These standards offer a framework for efficient product identification, traceability, and collaboration among stakeholders. The successful implementation of GS1 standards in India and around the world serves as a testament to their transformative potential.

As we navigate a future where technological innovations and sustainable practices are vital, the agri-input industry stands poised for remarkable growth. This report not only provides a comprehensive overview of the current state of affairs but also offers insights into the promising path ahead.



## | AGRI-INPUT INDUSTRY IN INDIA: BACKGROUND

The foundation of the Indian economy rests upon the agriculture and its allied sectors, collectively contributing to 18.3% of the nation's GDP in the year 2023. These allied sectors encompass a wide spectrum, including fisheries, horticulture, animal husbandry, dairy farming, poultry, and milk production. Notably, India's exports of agricultural and processed food products reached Rupees 3,40,888 crore during FY'23 (from April 2022 to March 2023).<sup>1</sup> Moreover, there has been a noticeable uptick in the contribution of agriculture to overall employment. This percentage stood at 42.5% in 2018-19 and saw an increase to 45.5% in 2021-22.<sup>2</sup>

Within the agricultural landscape, Indian farmers achieve a rice yield of 2.4 tonnes per hectare in 2023. In comparison, their counterparts in China and Brazil attain significantly higher yields of 4.7 and 3.6 tonnes per hectare, respectively.<sup>3</sup>

India's agri-input sector presents significant potential for economic growth and is closely monitored by key government departments such as the Ministry of Agriculture and Farmers Welfare. The agri-input industry in India comprises three key sub-sectors: Crop Protection (Pesticides), Seed, and Crop Nutrition (Fertilizers). These industries demonstrate promising growth potential fuelled by effective government initiatives.

---

<sup>1</sup> <https://www.ibef.org/industry/agriculture-india>

<sup>2</sup> <https://thewire.in/economy/share-of-agriculture-in-employment-rose-manufacturing-declined-in-2021-22-plfs>

<sup>3</sup> <https://planet.outlookindia.com/opinions/making-indian-agriculture-future-ready--news-415109>

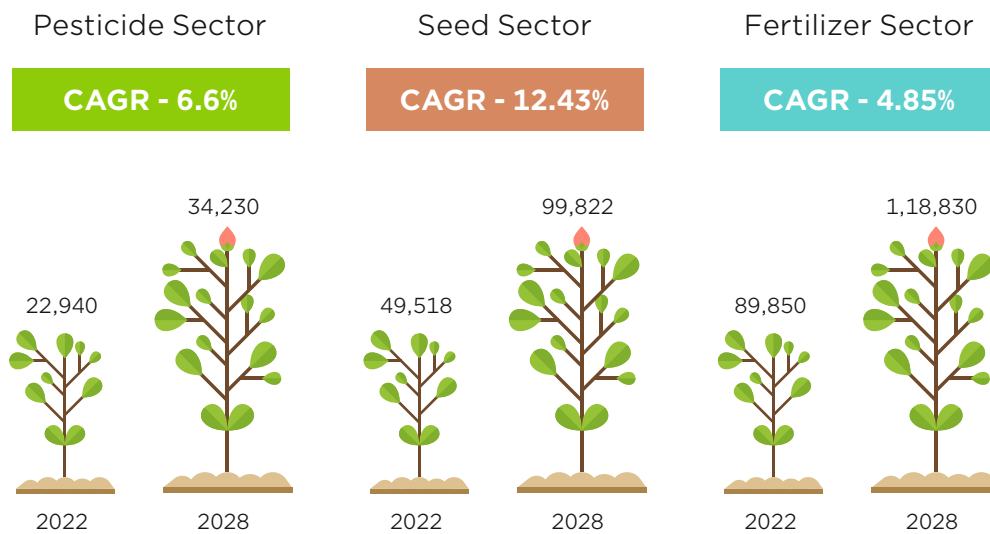
Valued at INR 22,940 crore in 2022, the pesticide industry in India exhibits a projected CAGR of 6.6%, reaching an estimated value of INR 34,230 crore by 2028.<sup>4</sup>

As of 2020, India ranks as the 9th largest consumer of pesticides worldwide.<sup>5</sup> China is the largest consumer of pesticides, with 1.8 million metric tons in 2021. The United States, Brazil and Argentina followed in second, third and fourth place, respectively.<sup>6</sup> Exhibiting remarkable growth, the Indian seed industry, valued at

INR 49,518 crore in 2022, is projected to reach a significant valuation of INR 99,822 crore by 2028, driven by an impressive CAGR of 12.43%.<sup>7</sup> The accelerated progress can be attributed to an effective government policy framework and its implementation on the ground.

**The fertilizer industry is the largest of the three major agri-input sectors in India. The market size of the fertilizer industry was INR 89,850 crore in 2022. It is projected to grow a CAGR of 4.85% and reach INR 1,18,830 crore rupees by 2028.**<sup>8</sup> The accelerated growth can be attributed to robust government initiatives and an increasing number of public-private partnerships.

### The Agri-input sector in india is expected to grow at a significant rate over the next six years



Estimated growth of Indian agri-input sector (in crore)

<sup>4</sup> <https://www.imarcgroup.com/indian-pesticides-market>

<sup>5</sup> <https://www.indianchemicalnews.com/chemical/indian-farmers-utilise-pesticides-optimally-ccfi-16499#:~:text=%E2%80%9CIndia's%20crop%20protection%20chemicals%20consumption,the%20lowest%20in%20the%20world.&text=India%20ranks%209th%20in,segments%20thereby%20e>

<sup>6</sup> <https://www.reportlinker.com/clp/global/13>

<sup>7</sup> <https://www.imarcgroup.com/seed-industry-in-india#:~:text=The%20seed%20industry%20in%20India,cover%20with%20a%20food%20reserve>

<sup>8</sup> <https://www.imarcgroup.com/indian-fertilizer-market#:~:text=The%20Indian%20fertilizer%20market%20was%20valued%20at%20INR%20898.5%20Billion%20in%202022.>

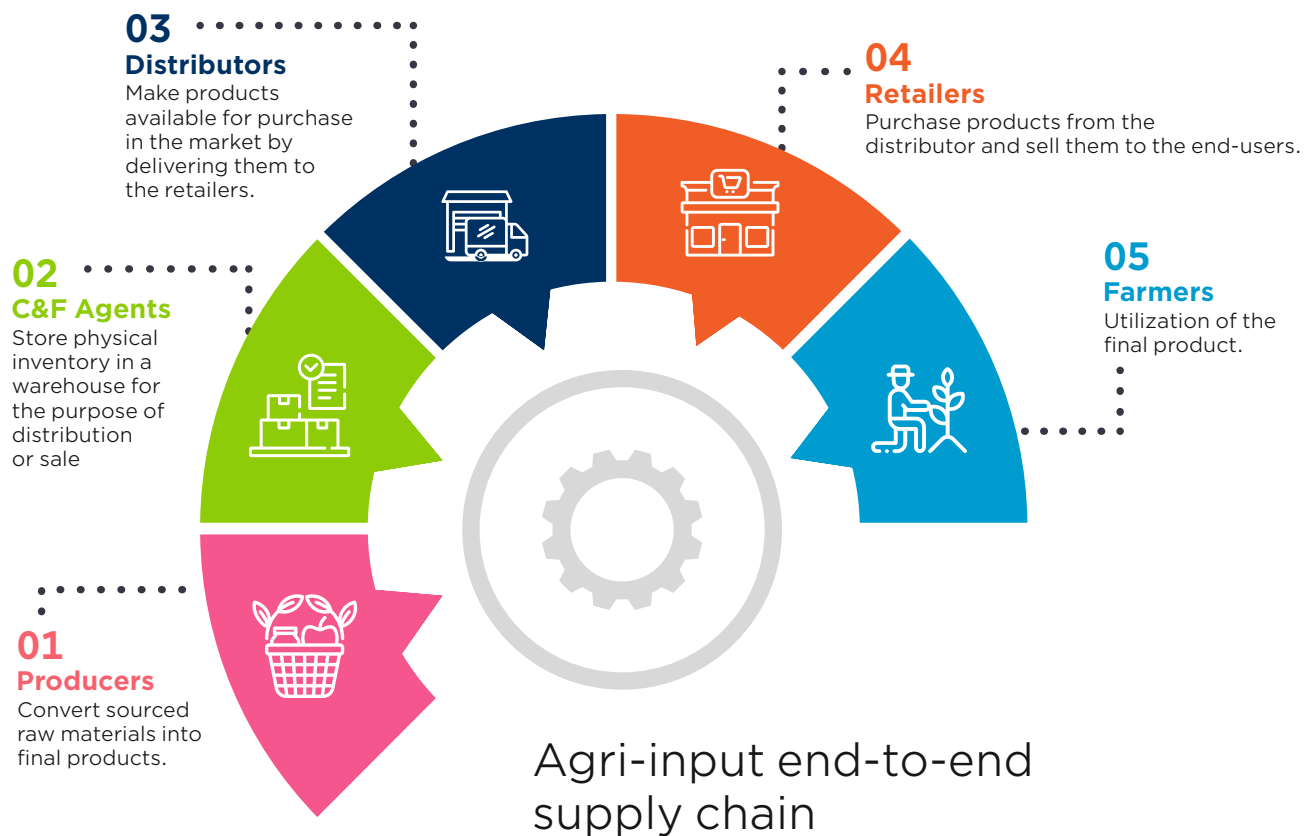
## AGRI-INPUT INDUSTRY IN INDIA: BACKGROUND

The end-to-end supply chain of agri-input products constitutes a holistic and integrated process that spans from the initial manufacturing of the product to its ultimate consumption by end-users.

This entangled and interconnected journey involves various stages, including production, storage, distribution, and utilization, all of which play vital roles in ensuring the seamless flow of these essential inputs across the agricultural supply chain. This complex web of activities necessitates efficient coordination, collaboration, and synchronization among

diverse stakeholders to optimize productivity, quality, and accessibility of agri-inputs, ultimately contributing to the growth and sustainability of the agricultural industry. With a large market size and government's proactive measures, the agri-input industry is on track to expand steadily.

### End-to-End supply chain of agri-inputs, from production to utilisation





## MAJOR REFORMS IN AGRI-INPUT SECTOR

With the agri-input sector displaying immense potential for economic growth, the Government of India has proactively introduced a series of initiatives aimed at doubling the farmers' income and implemented certain reforms to elevate the quality, transparency, and traceability of agri-input products throughout the supply chain.



### **Doubling farmers' income through five core principles**

The Department of Agriculture has outlined five core principles for doubling farmers' income in India. These include increasing crop productivity and total output, reducing the cost of production, ensuring remunerative prices for agricultural produce, effective risk management, and the adoption of sustainable technologies. The government has implemented various

initiatives and schemes to support these principles and drive agricultural transformation towards increased profitability and sustainability.

Reducing the cost of production is crucial for increasing farmers' income. Leveraging technology to extend the shelf life of crops, establishing post-production infrastructure for better market access, and digitizing seed production and distribution processes can significantly reduce costs. Integrating IT and ICT systems, adopting big data analytics, and digitalising the supply chain further enhance efficiency.



### **Enhancing transparency in pesticides through QR codes**

In 2019, the Department of Agriculture, Government of India introduced a regulation mandating the use of QR codes on insecticide labels. Subsequently, the Department of Agriculture and Farmers



## MAJOR REFORMS IN AGRI-INPUT SECTOR

Welfare issued the Insecticides (second amendment) rules in March, 2023. This amendment mandates the inclusion of a QR Code on retail insecticide packaging, providing a link to the manufacturing company's information upon scanning. The QR code must contain essential details such as the Unique Identifier, Batch Number, Manufacturing Date, Expiry Date, and a web link.<sup>9</sup>



### Transforming the seed industry through traceability and quality control

The Indian government recently introduced the SATHI portal, aiming to automate the entire seed supply chain. This portal covers various stages, including seed production, certification, licensing, inventory management, and sales by certified dealers, ensuring smooth traceability of seeds.<sup>10</sup>

Prominent attributes of the portal include the provision of Geographical Information System (GIS) reports through the Bharat Map Interface, a wallet service, and an offline-capable, device-agnostic mobile application. A quality inspection module is integrated to ensure thorough quality checks throughout the inspection process. Noteworthy features also involve generation of system-based sample slips, online transmission of samples to seed testing laboratories, and the issuance of tag certificates based on the digital tag register. The SATHI Portal encapsulates a modernized approach to streamline seed-related processes, enhancing transparency and efficiency within the agricultural domain.<sup>11</sup>



### Curbing counterfeits in the fertilizer industry through barcodes and QR codes

The "One Nation One Fertilizer" (ONOP) policy, introduced in October 2022, mandated the labelling of all Urea bags with a barcode. To be eligible for subsidies, fertiliser companies must ensure that their products are sold through barcode scanning, enabling seamless tracking of products across state boundaries. This policy aims to streamline procurement processes and enhance efficiency in the fertiliser supply chain.<sup>12</sup>

Recently, inspired by the success of QR codes in the pharmaceutical industry, the government extended their use to the fertilizer sector as a strategy to combat the issue of counterfeit products.



The Department of Pharmaceuticals, under the Ministry of Chemicals and Fertilizers, mandated the use of barcodes or QR codes on the labels of the top 300 selling formulations starting from August 1, 2023.<sup>12</sup>

The government is also planning to introduce barcoding in Single Super Phosphate (SSP) fertilizers to address the problem of fake or contaminated fertilizers that negatively impact farmers' production and income.<sup>13</sup>

While these initiatives and reforms demonstrate the government's efforts to double farmers' income, there remains a need for further emphasis on implementation to ensure effective impact.

<sup>9</sup> <https://legalitysimplified.com/2023/03/27/insecticides-second-amendment-rules-2023/>

<sup>10</sup> <https://seedtrace.gov.in/ms014/feesStructureHindi?stateCode=CENTRAL>

<sup>11</sup> <https://vikaspedia.in/agriculture/ict-applications-in-agriculture/sathi-portal>

<sup>12</sup> <https://www.mondaq.com/india/trademark/1225804/one-nation-one-fertilizer-policy>

<sup>13</sup> <https://www.news18.com/news/india/exclusive-after-pharmaceuticals-govt-set-to-launch-qr-codes-on-fertilizer-packs-to-fight-fake-products-6883159.html>



## DIGITAL INNOVATIONS DRIVING FORWARD THE AGRI-INPUT INDUSTRY IN INDIA

Technology's impact on global economies is evident, and India's agricultural sector is no exception, actively integrating digital innovations. The sector actively embraces innovations like AI, IoT-enabled monitoring, drones, and data analytics, propelling significant industry growth. These cutting-edge advancements, from AI to QR code-based tracing, are revolutionizing the agricultural value chain, effectively tackling productivity, quality, traceability, and sustainability challenges.

With the implementation of new technologies, farmers can gain real-time insights into their agricultural practices, allowing for more accurate predictions of crop health, yield, and potential risks, enabling informed decision-making. QR code based traceability ensures that origin and journey of agricultural products' critical tracking events are fully captured, ensuring high level of transparency and trust within the supply chain.

One of the recent technologies contributing to agricultural transformation

is drone technology. Drones, or unmanned aerial vehicles (UAVs), have become a game-changer for the industry. They offer wide variety of support that include accurate weather forecasts, providing crucial information to farmers, and enabling them to plan their operations effectively. Drones equipped with advanced imaging features aid in crop stress monitoring, growth stage assessment, and yield prediction. Additionally, they facilitate the targeted delivery of crop inputs and water, leading to resource optimization and cost-effectiveness.

In conclusion, the digital transformation of Indian agriculture, powered by new age technologies-driven innovations, is revolutionizing the sector's approach to traceability, quality, and productivity. With the seamless integration of technologies like drones and advanced data analytics, Indian farmers are well-equipped to meet the challenges of the future, ensuring sustainable and profitable growth for the entire industry.<sup>14</sup>

<sup>14</sup> <https://www.pwc.in/assets/pdfs/grid/agriculture/redefining-agriculture-through-artificial-intelligence.pdf>

## CHALLENGES FACED BY AGRI-INPUT INDUSTRY

Despite the promising growth potential in the agri-input sector and the government's efforts and reforms, stakeholders in the agri-input industry encounter significant challenges. The major challenges are related to circulation of non-approved, misbranded products, lack of track and trace, and supply chain inefficiencies. These challenges impact agricultural productivity, farmer livelihoods, and overall industry reputation. It is important to address these issues by introducing robust quality control measures, traceability mechanisms, stronger regulations, and improved supply chain management to ensure sustainable agriculture and the well-being of stakeholders.

### THE INDIAN AGRI-INPUT SECTOR'S FOUR KEY CHALLENGES





### Intrusion of low quality products

According to the industry estimates, the quality of farm input accounts for 20 to 25% of agricultural productivity.<sup>15</sup> Intrusion of low quality farm inputs in legitimate agri-supply chain has resulted in substantial losses for farmers.

Additionally, the lack of digitisation in tracking has added to the time-consuming process of identifying and addressing poor-quality farm inputs. Moreover, the pesticide industry faces challenges with the growing market for spurious pesticides, posing risks to crops and human health.

Addressing these issues is vital for sustainable agriculture and the well-being of farmers and consumers.<sup>16</sup>

### Counterfeit

Counterfeit agricultural inputs such as seeds and pesticides can have serious economic and environmental consequences.

According to a report by the Indian Council of Food and Agriculture, the use of counterfeit pesticides can result in crop losses of up to 30%.<sup>17</sup>

The prevalence of seed counterfeiting among farmers is a pressing issue, as they commonly rely on seed dealers rather than registered government shops or reputable corporations.

The lack of traceability exacerbates the problem, as it allows for the tampering or substituting of high-performance seeds with inferior counterparts.<sup>18</sup>

<sup>15</sup> <https://agricoop.nic.in/en/SeedsDiv>

<sup>16</sup> [https://www.researchgate.net/publication/359279646\\_Fertilizer\\_Use\\_in\\_Indian\\_Agriculture\\_and\\_its\\_Impact\\_on\\_Human\\_Health\\_and\\_Environment](https://www.researchgate.net/publication/359279646_Fertilizer_Use_in_Indian_Agriculture_and_its_Impact_on_Human_Health_and_Environment)

<sup>17</sup> <https://www.iccilombard.com/docs/default-source/ciri/2022/agriculture-food-processing-sector-risk-report-ciri-2022.pdf>

<sup>18</sup> <https://timesofindia.indiatimes.com/city/pune/pune-low-supply-poor-quality-lead-to-30-rise-in-prices-of-herbs-veggies/articleshow/95069526.cms>



### Inefficient supply chain

In the pesticide industry, a seamless exchange of reliable product information is urgently required across the entire supply chain. Enhanced interoperability is vital to facilitate the productive collaboration among stakeholders.<sup>19</sup>

The seed industry faces certain challenges in managing demands due to its unpredictability. This results in companies struggling to meet the demands adequately, mainly due to supply chain inefficiencies in a highly unorganised market.

Meanwhile, the fertilizer sector witnessed a rapid rise in speciality fertilizer demand, where distributors play a pivotal role in water-soluble fertilizer sales. Nonetheless, some Indian companies confront obstacles due to declining sales triggered by supply chain gaps and leakages between

### Lack of visibility

Lack of visibility in the pesticide industry continues to plague the supply chain that inflict substantial damage upon the reputation and brand image of manufacturers. The fertiliser industry also suffers considerable losses due to pilferage and leakages. As these products traverse the supply chain, instances of pilfering occur due to lack of traceability, leading to losses for manufacturers. Addressing pilferage issues is crucial to ensure the integrity of the supply chain, and foster a conducive environment for the growth of the agricultural industry.<sup>20</sup>

The Indian pesticides, seeds, and fertilizers industry grapples with pressing challenges, including counterfeiting, pilferage and lack of visibility. These obstacles hinder agricultural productivity, jeopardise farmer livelihoods, and tarnish the industry's credibility. By taking proactive steps to overcome these challenges, the industry can promote sustainable agriculture, protect farmer interests, and ensure the production of high-quality agri-input.

<sup>19</sup> <https://www.techsciresearch.com/blog/top-5-challenges-fertilizers-industry-will-face-in-2018/85.html>

<sup>20</sup> <https://economictimes.indiatimes.com/news/india/fake-pesticides-worth-rs-1-crore-seized-one-arrested-in-jkhand/articleshow/101446805.cms#:~:text=An%20illegal%20factory%20allegedly%20manufacturing,km%20from%20state%20capital%20Ranchi.>



## SIGNIFICANT ROLE OF GLOBAL STANDARDS IN IMPROVING INDIA'S AGRI-INPUT SECTOR

Global standards in the Agri-input sector deliver significant advantages, including brand protection, identifying source of origin, interoperability, quality assurance, effective supply-chain management, enhanced data accuracy, reduced pilferage, and counterfeit management.

These standards ensure reliable, unique, ubiquitous product identification, upstream/downstream traceability, establish product ownership and validation, facilitating consumer trust, optimized operations, and seamless collaboration among stakeholders. By embracing these standards, the Agri-input industry can drive efficiency, transparency, and compliance while safeguarding supply chain integrity and consumer satisfaction.

# GLOBAL STANDARDS PROVIDE FOUR KEY BENEFITS TO THE AGRI-INPUT SECTOR



## Role of Global standards in the agri-input sector



### Effective supply chain management

Journey of agri-inputs involves multiple change of hands from one custodian to another which requires supply chain stakeholders to understand & communicate with each other. GS1 standards provide a

globally proven framework for product identification and interoperability leading to enhanced and effective communication among the stakeholders.

GS1 standards & services, such as the Global Trade Item Number (GTIN) ISO/IEC 15459-6 & ISO/IEC 6523 & GS1 DataKart trace, offer a reliable product identification

business and business-to-consumer data. Incorporating GS1 standardization not only equips products with scannable URLs through QR codes, but also incorporates universally recognized identifiers, ensuring compatibility across industries. This system operates on a non-proprietary, vendor-neutral basis, maintaining the manufacturer or brand owner's authority while enabling links to multiple information sources via a single QR code, streamlining efficiency by saving space.

The implementation of the GS1 Digital Link standard further supports the objectives of the 'One-barcode' initiative. This initiative underscores the continued relevance of barcodes in various applications, such as traceability and point-of-care scanning. With the introduction of GS1 Digital Link, a single barcode now possesses the capability to access comprehensive digital product information, marking a significant advancement for manufacturers and distributors.



### Counterfeit management and quality assurance

The increasing level of counterfeit activity in agri-product sector poses a significant challenge to the industry. GS1 is ideally positioned to play a key role in the development and deployment of global standards, services and solutions to combat counterfeiting. By taking advantage of GS1 standards, both governments and companies can have harmonised information for better risk management and better facilitate the authentication of genuine products to help reduce the risk of harmful counterfeit products. GS1's global standards for identification of products, locations, and the communication of data associated

should form the basis for a company's anti-counterfeit protocols and brand protection strategies. The GS1 system enables unique object identification along with the utilization of various authentication systems and tools.<sup>22</sup>



### Enhanced Visibility

GS1 standards enables visibility and traceability throughout the supply chain, preventing pilferage of goods to unauthorized channels. The real-time data enabled through GS1 standards allows companies to closely monitor the quantity and movement of their products, facilitating the identification of any discrepancies or suspicious activities. This further allows businesses to effectively trace the critical events, identifying occurrence of pilferage incidents, and pinpoint the specific stage in the supply chain where it took place. This empowers companies to take prompt and targeted measures to mitigate pilferage effectively and prevent future occurrences.<sup>23</sup>

Embracing global standards in the Agri-input sector empowers businesses with efficient counterfeit detection, reduced pilferage, streamlined supply-chain management, and improved data accuracy. These standards enable businesses to thrive in a competitive market while meeting compliance requirements. Embracing GS1 standards leads to greater efficiency, transparency, and collaboration among stakeholders, ultimately driving the Agri-input industry towards a sustainable and prosperous future.

<sup>22</sup> [https://www.gs1.org/docs/GS1\\_Anti-Counterfeiting\\_White\\_Paper.pdf](https://www.gs1.org/docs/GS1_Anti-Counterfeiting_White_Paper.pdf)

<sup>23</sup> <https://www.gs1india.org/authentication-counterfeit-detection/>



and traceability solution. Stakeholders can conveniently verify product details, manufacturing details with unique barcode/QR code assigned to each SKU/unit.

Any company can utilize the Global Trade Item Number (GTIN) to provide a unique identification for all its trade items. GS1 defines trade items as products or services that are priced, ordered or invoiced at any point in the supply chain.

The GS1 Digital Link standard offers a comprehensive solution for adding additional data attributes like batch numbers, serial numbers, expiry dates, and measured weights to the URL syntax. This data can be captured and utilized by scanning systems. The primary objective of GS1 Digital Link is to provide easy access to information about products or services, leveraging the power and flexibility of GS1 ID keys like GTIN. This gateway to online content enhances supply chain traceability, brand loyalty, safety information, and more. The true strength of GS1 Digital Link lies in its adaptability, allowing connections to various business-to-business and business-to-consumer information through structured GS1 identifiers, catering to multiple applications from smartphone cameras to point of sale scanners.



### Data Accuracy

GS1 Digital Link QR codes on product labels provide stakeholders with comprehensive information about the products, including their chemical composition. This not only enhances stakeholders' knowledge but also ensures compliance with government rules and

guidelines in addition to managing their internal supply chains. GS1's system encompasses technical standards for Automatic Identification and Data Capture (AIDC), master data standards, and information exchange standards. These standards enable automated data capture, sharing, and seamless integration of data carried on physical items with electronic information. GS1 Identification keys link with electronic database records, validating information and enhancing data quality in declarations and documents. This fosters transparency and trust in the data provided.<sup>21</sup>

The Government of India has issued a notification mandating the inclusion of specific information in the QR code labels of insecticides. The QR code must contain the unique identifier or GTIN, Batch number, Date of manufacturing, Expiry date, and the manufacturing company's website link. This measure aims to facilitate quick traceability of crop protection products, ensuring farmers have access to genuine products and can easily verify their authenticity using a mobile phone to scan the QR code and access comprehensive label information from the manufacturer's website.

The GS1 Digital Link standard amplifies the capabilities of GS1 identifiers by integrating them into the digital realm of the web. This integration transforms GS1 identifiers, like GTIN, into a gateway to consumer information, fostering brand loyalty and enhancing traceability within the supply chain.

While conventional URLs typically lead to specific websites, the GS1 Digital Link offers a broader scope, facilitating connections to diverse business-to-

<sup>21</sup> <https://www.gs1india.org/blog/prevent-incorrect-product-data-with-datakart/>



## SUCCESS STORIES OF GS1 STANDARDS IMPLEMENTATION

**G**S1 standards have been implemented successfully across the globe and in India, with inspiring examples showcasing their impact. One such example is the E-Spice Bazaar, empowering chilli farmers through traceability, ensuring market reach and product quality. Another remarkable case is GrapeNet, revolutionising India's grape exports with meticulous traceability and compliance, safeguarding the reputation of top suppliers. Case like this exemplify how GS1 standards foster transparency, efficiency, and consumer confidence across diverse industries.

### **E- Spice Bazaar, a blockchain-based traceability solution for transforming chilli farming in India**

UNDP and Spices Board India joined forces



to develop a blockchain-based traceability solution for Indian Spices, utilising global GS1 standards. The initiative, backed by the Department of Electronics and Information Technology, caters to the needs of chilli farmers in Andhra Pradesh and Telangana, providing them with an e-commerce platform for better market reach and price

realisation. By ensuring "one step up, one step down" traceability, the system enables direct purchase at competitive prices, guarantees product quality, and facilitates farm-level traceability, enhancing consumer confidence and acceptance by international importers.<sup>24</sup>



**GrapeNet - India's innovative grape traceability System ensuring quality export**

GrapeNet, a groundbreaking traceability system developed by APEDA, has revolutionised India's grape export industry. Threatened by pesticide residues, India's reputation as a top grape supplier to Europe was at risk, causing significant financial losses for exporters. GrapeNet emerged as a comprehensive solution involving over 40,000 farmers, 100 packing houses, and 100 exporters, supported by state government departments. Through its centralised web-based monitoring platform and the Residue Monitoring Plan (RMP), GrapeNet ensures real-time tracking and traceability, certifying product

standardisation and compliance. Its success has garnered prestigious awards, affirming its crucial role in safeguarding India's grape exports and enhancing consumer trust in the produce.



GrapeNet has successfully monitored every grape consignment to the European Union since 2007, covering over 40,000 farmers, 100 packing houses, 100 exporters, 20 laboratories, and 32 district-level state officials.<sup>25</sup>

The implementation of GS1 standards in India and globally has led to remarkable transformations. E-Spice Bazaar empowers chilli farmers while GrapeNet revolutionises grape exports. These examples underscore the significance of GS1 standards in fostering transparency, efficiency, and consumer confidence across industries, signifying their vital role in shaping the modern supply chain landscape.

<sup>24</sup> [http://espicebazaar.in/en/aboutus/About-e-spicebazaar#:~:text=The%20E2%80%9Ce%2D%20Spice%20Bazaar%3A,Government%20of%20India\)%%20to%20cater](http://espicebazaar.in/en/aboutus/About-e-spicebazaar#:~:text=The%20E2%80%9Ce%2D%20Spice%20Bazaar%3A,Government%20of%20India)%%20to%20cater)

<sup>25</sup> <https://traceability.apeda.gov.in/APEDATrustChain/GrapeNet/#:~:text=For%20the%20first%20time%20in,that%20hit%20Indian%20grapes%20sector.>

# CASE STUDY ON Implementation of standards in agriculture sector





## Implementation of GS1 Digital Link QR Codes on plant protection products

### Background

Ministry of Agriculture and Farmers Welfare, Department of Agriculture and Farmers Welfare, has issued a notification dated March 17, 2023 specifying QR code implementation on retail packaging.

As per notification, it requires that QR Code shall be placed on retail pack (primary or secondary pack as the case may be) at a suitable place where on scanning the QR code by scanning equipment like a mobile phone, a web link or link for opening the URL of the manufacturing company will appear, which on pressing or clicking, will take the user to the entire unique information of label and leaflet and the QR code shall contain at least the

**Unique Identifier or GTIN**

**Date of Expiry**

**Batch Number**

**Web link/URL**

**Date of Manufacturing**

## IMPLEMENTATION OF GS1 DIGITAL LINK QR CODES ON PLANT PROTECTION PRODUCTS

To support the industry on the implementation of QR codes, GS1 India, collaborated with the industry to conceptualise a solution using global supply chain standards. The proposed solution will not only help companies to print QR code and fulfil compliance related requirements but subsequently allow same QR code to be extended in the supply chain to optimise business operations.

It is also anticipated that industry faces the following challenges and are expected to be addressed by this initiative.



### Solution Framework

The Solution framework is designed based on the objectives set by the notification on QR code implementation and existing supply chain practices of pesticide industry keeping following requirements at the core of the development -

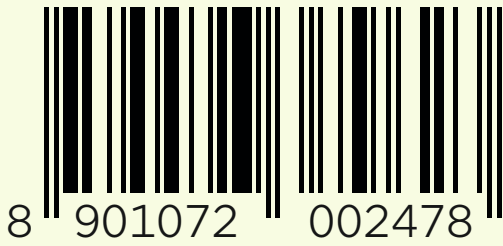
- Ease of use
- Minimal software & hardware requirements
- In alignment with current operations
- Integration with 3rd party
- Web-based application to be hosted on a secure cloud

The end-to-end, cloud-based solution enables users to generate QR code with a

web URL based on GS1 Digital Link Standards using GTIN - Global Trade Item Number as a-

- Unique Product Identification Code
- Batch no.
- Date of manufacturing
- Date of expiry





Global Trade Item Number (GTIN) are global standards used by companies to uniquely identify trade/retail items. These are unique 13 digit numbers allocated to a product which are accepted in both global and domestic markets.

GS1 Digital Link standards help create a weblink with GS1 keys and application identifiers which further gets encoded into a QR code helps organisation to comply to regulation, access traceability information, inventory management, recall etc.

Upon scan of the QR code, user will be redirected to a web page displaying unique label and leaflet information. This application is capable of integrating with any 3rd party ERP, SAP or custom developed application for product master data synchronisation.

This interoperable & standards based QR code can be further used for inventory management, track and trace, distribution management, recall communication etc., beyond mandatory compliance.

## One Standard QR code - Multiple Uses



### Implementation Benefits

- a) Real time product validation enabling users to distinguish between original and misbranded products contributing to brand protection.
- b) Single platform to manage product label information linked to GTIN and batch.
- c) Helps customers with easy access to product information, how to use video(s), product origin details etc.
- d) Future possibility of extending the QR code for inventory management, track and trace, recall, feedback management etc.
- e) Enables insights which is expected to help in strategic planning & better decision-making in today's data-driven business landscape.

## TESTIMONIALS



We have been working closely with GS1 India to implement QR code on product packaging as per the guidelines issued by the Government in the pesticide sector. The application extended by GS1 India to generate QR code was easy to implement and simple to use. The team proactively supported us through the entire implementation journey which enabled us to complete the project on time.”

**Mr. Ajay Kumar Sinha**

GM, India Pesticides Ltd.



We are very happy with the QR code generated from GS1 India DataKart platform. The platform is easy to use, even for non-technical users. The QR codes are clear and easy to scan, even on small devices. We have found the platform to be very helpful in our business, as it allows us to quickly and easily create and print QR codes for our products and services. We would definitely recommend the DataKart platform to others.”

**Mr. K. R. Gavish Kumar**

Manager, Kemicides Crop Protection Private Limited







## CONCLUSION

The agri-input industry in India stands at a pivotal juncture, poised for significant growth and transformation. Government initiatives aimed at doubling farmers' income, coupled with the adoption of global standards like GS1 and innovative technologies like QR codes, hold the key to addressing critical challenges such as quality concerns, counterfeit products, and supply chain inefficiencies.

These initiatives not only enhance traceability and transparency but also empower stakeholders to make informed decisions, driving efficiency, and ultimately fostering a sustainable and prosperous future for Indian agriculture.

By embracing global standards and harnessing the power of digital innovations, the agri-input sector can embark on a journey towards resilience and success. The integration of GS1 standards, as exemplified by successful case studies, demonstrates the tangible impact of standardized traceability, enhanced data accuracy, and consumer trust.

As India's agri-input industry navigates its path forward, a concerted effort to implement these standards and technologies will undoubtedly pave the way for a thriving, transparent, and quality-driven ecosystem that benefits all stakeholders involved.

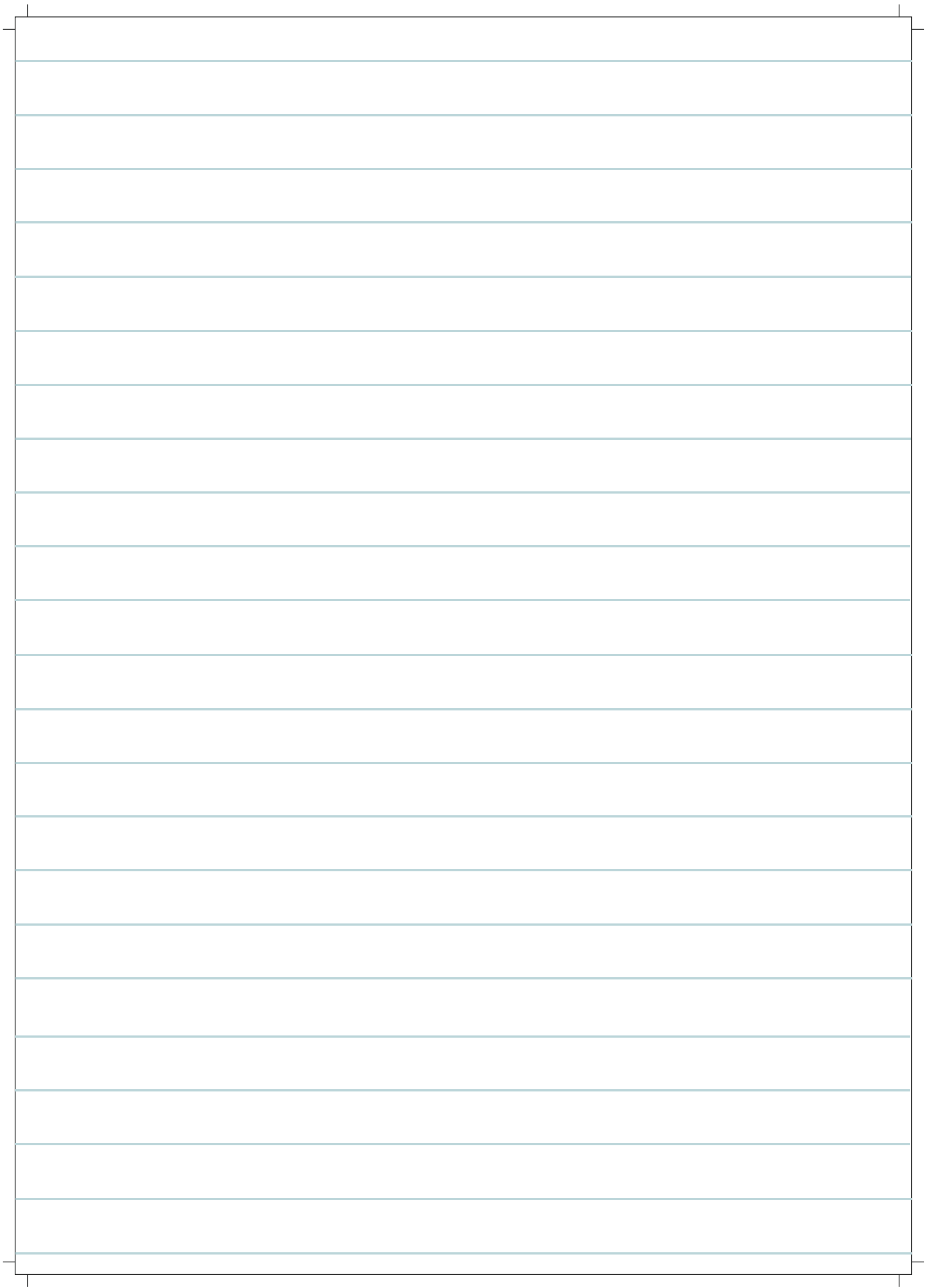
## **DISCLAIMER**

GS1 India does not purport to make and hereby disclaims all representations, warranties, or undertakings to any entity or person (including without limitation as to the accuracy, completeness, timeliness, or reliability of the contents of the whitepaper or any other related materials published by GS1 India). To the maximum extent permitted by law, GS1 India shall not be responsible and/or liable for any indirect, special, incidental, consequential, or other losses of any kind, in tort, contract, or otherwise (including, without limitation, any liability arising from default or negligence on the part of any of them, or any loss of revenue, income, or profits, and loss of use or data) arising from the use of this whitepaper, or any other related materials published, or its contents (including, without limitation, any errors or omissions).

The content of this document is provided solely for informational purposes and does not constitute any binding commitment. You are cautioned not to place undue reliance on the content or statements given that these statements may involve known and unknown risks, uncertainties, and other factors that may cause the actual future results to be materially different from those described. No part of this document shall be copied, reproduced, distributed, or disseminated in any way without the prior written consent of GS1 India.

## **About GS1 India**

GS1 India is a standards organisation setup by the Ministry of Commerce and Industry, Government of India, and apex trade bodies comprising CII, FICCI, ASSOCHAM, FIEO, IMC, BIS, IIP, Spices Board, and APEDA to spread awareness and provide guidance on the adoption of global standards by Indian industry and government on barcodes and RFID. In order to support the industry, GS1 India has developed a standards-based DataKart Trace service that provides seamless supply chain traceability, provides end-to-end visibility, and can be used by multiple industry sectors.





330, C-Wing, August Kranti Bhawan,  
Bhikaji Cama Place, New Delhi-110066

T: +91 (11) 42 890 890

E: [info@gs1india.org](mailto:info@gs1india.org)

W: [www.gs1india.org](http://www.gs1india.org)



All content copyright @ GS1 India