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Agro. Chemical (Crop Protection) Industry Report

Table of Contents

Chapter No	Particulars	Page No
1	Indian Macro economy scenario	3-5
2	Indian Macro Economy Parameters	6-8
3	An overview Agri. Chemical Industry and its various segments	9-10
4	Global scenario – Crop Protection Industry Current Market Scenario	11-12
5	An overview of Pesticides' Role Crop Protection Consumptions by type	13-29
6	Key growth drivers	30-31
7	Key Government Initiatives	32-32
8	Key market players and their performance in Agrochemical sector in FY2023-24	33-33
9	Future outlook and Final word	34-35

1. Indian Macro Economy an overview

The Indian economy is on a strong wicket and stable footing, demonstrating resilience in the face of geopolitical challenges. The Indian economy has consolidated its post-Covid recovery with policymakers – fiscal and monetary – ensuring economic and financial stability. Nonetheless, change is the only constant for a country with high growth aspirations. For the recovery to be sustained, there has to be heavy lifting on the domestic front because the environment has become extraordinarily difficult to reach agreements on key global issues such as trade, investment and climate.

High economic growth in FY24 came on the heels of growth rates of 9.7% and 7.0%, respectively, in the previous two financial years. The headline inflation rate is largely under control, although the inflation rate of some specific food items is elevated. The trade deficit was lower in FY24 than in FY23, and the current account deficit for the year is around 0.7% of GDP. In fact, the current account registered a surplus in the last quarter of the financial year. Foreign exchange reserves are ample. Public investment has sustained capital formation in the last several years even as the private sector shed its balance sheet blues and began investing in FY22. Now, it has to receive the baton from the public sector and sustain the investment momentum in the economy. The signs are encouraging.

Future ahead:-

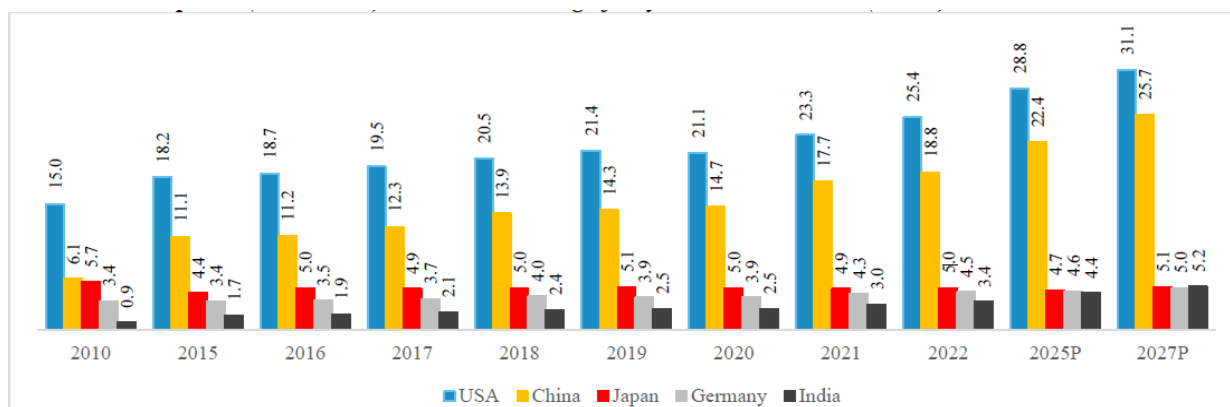
While contemplating the challenges that lie ahead, one should not be daunted because the social and economic transformation of democratic India is a remarkable success story. We have come a long way. The economy has grown from around USD288 billion in FY93 to USD3.6 trillion in FY23. India has generated more growth per dollar of debt than other comparable nations. Abject poverty has all but been eliminated. Human development indicators have improved, and more Indians, especially women, are getting educated. For all its flaws and warts, the system has delivered accountability through the democratic process and public discourse, where the occasional and rarer mature commentary proves effective. We should not lose sight of that.

Global Economy:-

Following the onset of the Covid-19 pandemic crisis, the global economy has experienced a combination of both risks and opportunities. Progressing toward recovery, the global economy started returning to normalcy after a prolonged struggle; the governments worldwide have taken swift and appropriate measures, including widespread vaccination efforts and the consistent implementation of fiscal and monetary support strategies. Right when the economic situation seemed to be improving after the Covid-19, the Russia-Ukraine geopolitical conflict unfolded, contributing to global inflationary pressures and resulting in record-high levels not witnessed in the past four decades.

On the back of enhanced vaccination coverage and continued fiscal and monetary stimuli across countries, the GDP of the World grew by 13.2% CY 21 against a contraction of 3.0 % in CY 20. The positive trend continued into CY 22, with a growth rate of 4.7%. The global GDP is forecasted to grow from USD 101.0 trillion in CY 22

to 128.5 in CY 27, thus growing at a CAGR of 4.9% during the forecasted period. The GDP (at current price) of the major economies in the world is presented in the table below



Source: World Bank Data, IMF, RBI; CY 2022 for India refers to FY 2023 data and so on.

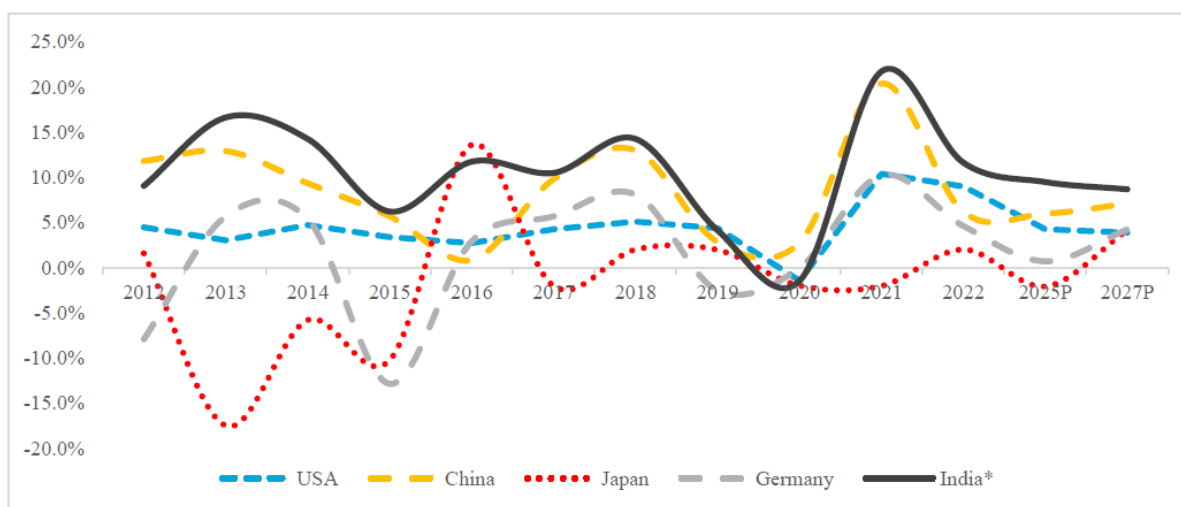
Country	Rank in GDP (CY 22)	Rank in GDP (PPP)	CY 10	CY 15	CY 16	CY 17	CY 18	CY 19	CY 20	CY 21	CY 22	CY 25P	CY 27P	CAGR (2016-21)	CAGR (2022-27)
USA	1	2	15.1	18.2	18.7	19.5	20.5	21.4	21.1	23.3	25.4	28.8	31.1	4.5%	4.1%
China	2	1	6.1	11.1	11.2	12.3	13.9	14.3	14.7	17.7	18.8	22.4	25.7	9.6%	6.5%
Japan	3	4	5.8	4.4	5.0	4.9	5.0	5.1	5.0	4.9	5.0	4.7	5.1	-0.4%	0.4%
Germany	4	5	3.4	3.4	3.5	3.7	4	3.9	3.9	4.3	4.5	4.6	5.0	4.2%	2.1%
India	5	3	0.9	1.7	1.9	2.1	2.4	2.5	2.5	3.0	3.4	4.4	5.2	9.6%	8.9%
UK	6	10	2.5	2.9	2.7	2.6	2.9	2.8	2.7	2.9	3.2	3.6	4.0	1.4%	4.6%
Brazil	12	8	2.2	1.8	1.8	2.1	1.9	1.9	1.5	1.6	1.8	2.3	2.6	-2.3%	7.6%
Russia	11	6	1.6	1.4	1.3	1.6	1.7	1.7	1.5	1.8	1.9	2.2	2.3	6.7%	3.9%
World	-	-	66.6	75.2	76.5	81.4	86.5	87.7	85.0	96.5	101.0	116.5	128.5	4.8%	4.9%

The world economy has experienced a contraction in GDP growth during the pandemic i.e. in CY 20. However, the governments and central banks globally have taken decisive actions by implementing fiscal and monetary stimulus measures to bolster the process of economic recovery. Further, the gradual recovery of global supply chains and increased international trade have contributed to the positive growth trajectory. These well-calibrated initiatives and the recovery to global supply-chain have been directed towards reinstating consumer and business confidence, stimulating demand, and achieving stability in financial markets. As a result of these concerted efforts, multiple countries and regions have demonstrated encouraging signs of economic revival and notable growth

2. Indian Macro Economy Parameters

India's economy carried forward the momentum it built in FY23 into FY24 despite a gamut of global and external challenges. The focus on maintaining macroeconomic stability ensured that these challenges had minimal impact on India's economy. As a result, India's real GDP grew by 8.2 per cent in FY24, posting growth of over 7 per cent for a third consecutive year, driven by stable consumption demand and steadily improving investment demand.

The economies of India and China witnessed remarkable growth in nominal GDP during the calendar year 2021 and 2022, following the COVID-19 pandemic. India demonstrated a substantial year-on-year nominal GDP growth rate of 21.8% in CY 21 followed by a growth of 11.7% in CY 22. Meanwhile China experienced a notable growth rate of 20.4% in CY 21 and 6.2% growth in CY 22. On the other hand, major economies like the United States and Germany reported GDP growth rates of 10.4% and 10.3% respectively during CY 21 followed by 9% and 4.7% GDP growths in CY 22. Japan, however, experienced a negative growth in GDP (-2.0%) during CY 21. Nevertheless, in CY 22, Japan's GDP rebounded with a growth rate of 2%.



Source: India Data from RBI, Future growth rate from OECD Data, Technopak Analysis

1USD = INR 80

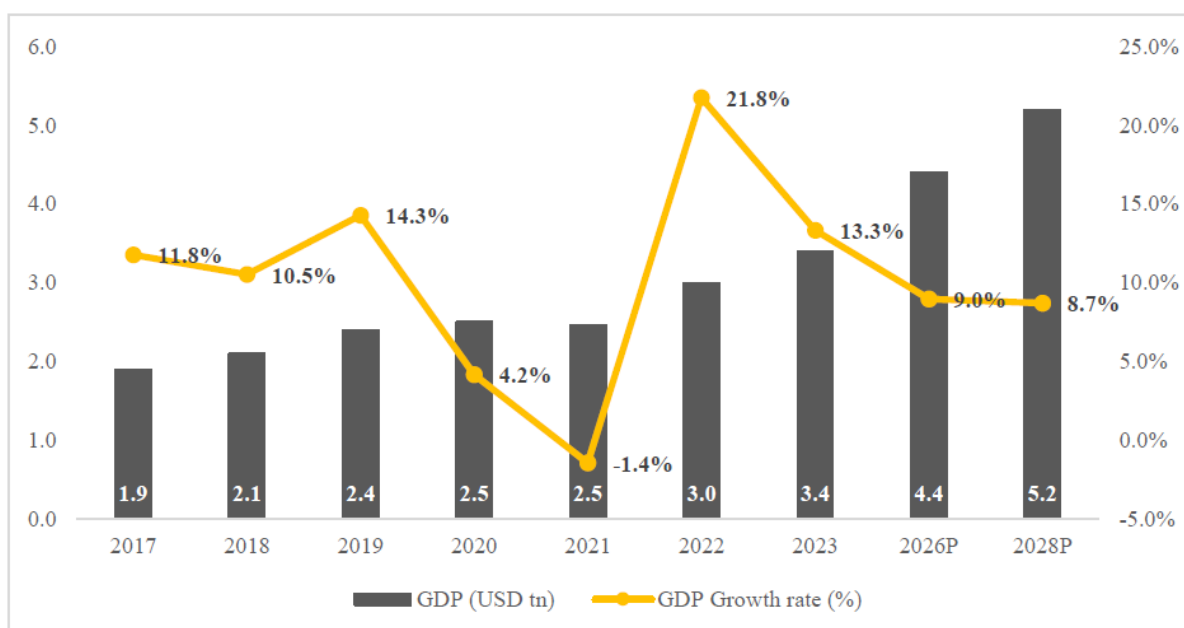
*For India, CY 11 represents FY 12 and so on.

	CY 12	CY 13	CY 14	CY 15	CY 16	CY 17	CY 18	CY 19	CY 20	CY 21	CY 22	CY 25P	CY 27P
USA	4.5%	3.1%	4.8%	3.4%	2.7%	4.3%	5.1%	4.4%	-1.4%	10.4%	9.0%	4.3%	3.9%
China	11.8%	12.9%	9.4%	5.7%	0.9%	9.8%	13.0%	2.9%	2.8%	20.4%	6.2%	6.0%	7.1%
Japan	1.6%	-17.5%	-5.8%	-10.2%	13.6%	-2.0%	2.0%	2.0%	-2.0%	-2.0%	2.0%	-2.0%	4.2%
Germany	-7.9%	5.7%	5.4%	-12.8%	2.9%	5.7%	8.1%	-2.5%	0.0%	10.3%	4.7%	0.7%	4.3%
India*	9.1%	16.7%	14.3%	6.2%	11.8%	10.5%	14.3%	4.2%	-1.4%	20.0%	11.7%	9.5%	8.7%

India is the world's 5th largest economy and expected to be in the top 3 by FY 28

India ranked fifth in the world in terms of nominal gross domestic product ("GDP") for FY 22 and is the third largest economy in the world in terms of purchasing power parity ("PPP"). India is expected to be USD ~5.2 trillion economy by FY 28 and is estimated to be the third largest economy surpassing Germany and Japan

India's nominal GDP at current prices (In USD Tn) and GDP Growth rate (%) (FY).



Source:-<https://www.indiabudget.gov.in/economicsurvey/>

India's nominal GDP has grown at a CAGR of 9.6% between FY 17 and FY 22 and is expected to continue the trend by registering an expected CAGR of 8.9% for 5-year time period from FY 23 to FY 28.

Since FY 05, the Indian economy's growth rate had been twice as that of the world economy and it is expected to sustain this growth momentum in the long term. From FY 23 to FY 28, India's nominal GDP is expected to grow at a CAGR of 8.9%, which compares favourably to the world average (4.9%) and with other major economies,

including China (6.5%), UK (4.6%), Japan (0.4%), Germany (2.1%) and the USA (4.1%) for the similar period of CY 22 to CY 27. It is also expected that the growth trajectory of Indian economy will enable India to be among the top 3 global economies by FY 28. Several factors are likely to contribute to economic growth in the long run.

Outlook of the Indian Economy: -

The Indian economy recovered swiftly from the pandemic, with its real GDP in FY24 being 20 per cent higher than the pre-COVID, FY20 levels. This meant a CAGR of 4.6 per cent from FY20, despite a 5.8 per cent decline in FY21 inflicted by the pandemic. During the decade ending FY20, India grew at an average annual rate of 6.6 per cent, more or less reflecting the long-run growth prospects of the economy. This is the background against which we can see the prospects for FY25.

IMF projects the global economy to grow at 3.2 per cent in 2024, with risks being broadly balanced. The average annual global growth was 3.7 per cent during the decade ending FY20. Inflationary pressures have moderated in most economies with declining global commodity prices and easing of supply chain pressures. However, core inflation remains sticky and driven by high service inflation. Many central banks have hinted at the peaking of the interest rate hike cycle. The ECB has already cut the policy rate, while the Fed has hinted at reducing the rate in 2024. If the services inflation across economies moderates faster, that may allow central banks to bring forward the monetary policy easing cycle earlier than currently anticipated. A likely reduction in policy rates by central banks of AEs, especially the Fed, will open the space for central banks of EMEs to follow the lead, bringing down the cost of capital.

Domestic growth drivers have supported economic growth in FY24 despite uncertain global economic performance. Improved balance sheets will help the private sector cater to strong investment demand. A note of caution is warranted here. Private capital formation after good growth in the last three years may turn slightly more cautious because of fears of cheaper imports from countries that have excess capacity. While merchandise exports are likely to increase with improving growth prospects in AEs, services exports are also likely to witness a further uptick. A normal rainfall forecast by the India Meteorological Department and the satisfactory spread of the southwest monsoon thus far are likely to improve agriculture sector performance and support the revival of rural demand. However, the monsoon season still has some ways to go. Structural reforms such as the GST and the IBC have also matured and are delivering envisaged results.

3. An Overview Agri. Chemical Industry and its various segments.

India is an agrarian country, where more than 50% people are dependent on agriculture for their livelihood and is the largest producer of spices, pulses, milk, tea, cashew and jute & the 2nd largest producer of wheat, rice, fruits and vegetables, sugarcane, cotton and oilseeds. Agricultural inputs, essential for enhancing farm productivity and crop quality, encompass seeds, nutrients, and agrochemicals. High-quality seeds, including hybrid, open pollinated, and genetically modified varieties, form the foundation of successful crop production by offering traits such as higher yield, disease resistance, and better adaptability. Nutrients, divided into macronutrients like nitrogen, phosphorus, and potassium, and micronutrients such as iron and zinc, are crucial for plant growth and development, typically provided through organic or synthetic fertilizers. Agrochemicals, including pesticides, herbicides, fungicides, and plant growth regulators, play a significant role in managing pests, diseases, and weeds, thereby ensuring healthy crop growth. The judicious use of these inputs can significantly boost agricultural productivity, ensure sustainability, and support food security, although challenges such as accessibility, affordability, environmental impact, and regulatory compliance need to be addressed to maximize their benefits and minimize potential risks.

Application of Agrochemicals & fertiliser:-

Flow of Agricultural Inputs:-



Seeds:-

Seed is the fundamental and most critical input for sustainable agriculture. The effectiveness of all other inputs largely depends on the quality of seeds. It is estimated that quality seeds alone contribute directly to about 15- 20% of total production, depending on the crop, and this contribution can be increased up to 45% with efficient management of other inputs. The developments in the seed industry in India, particularly over the last 30 years, have been very significant. The Government of India undertook major restructuring of the seed industry through the National Seed Project Phase-I (1977-78), Phase-II (1978-79), and Phase-III (1990-1991), which strengthened the necessary seed infrastructure. This restructuring marked the first turning point in shaping an organized seed industry. Another significant milestone was the introduction

of the New Seed Development Policy (1988-1989), which transformed the seed industry's character. The policy provided Indian farmers with access to the best seeds and planting materials available globally.

Agro-chemical:

Agrochemicals (Crop protection products) are designed to protect crops from insects, diseases and weeds. They do so by controlling pests that infect, consume or damage the crops. Uncontrolled pests significantly reduce the quantity and quality of food production. The Food and Agriculture Organization (FAO) estimates that up to 40% of food crops are lost due to plant pests and diseases annually. Furthermore, food crops must compete with 30,000 species of weeds, 3,000 species of nematodes and 10,000 species of plant-eating insects. Agrochemicals are the last and one of the key inputs in agriculture for crop protection and better yield. Notably, India is in top 5 global producer of agrochemicals.

Agrochemicals are broadly classified as insecticides, herbicides, fungicides, rodenticides etc. depending on the type of pest they control.

Types of key Agro-Chemicals:-

Insecticides	Fungicides	Herbicides
•Control insect, pests which reduce crop yields and quality	•Prevent and cures fungal plant diseases	•Prevents or reduces weeds, which hamper crop growth and harvest

Crop Protection Industry:-

The different types crop protection chemicals covered in the industry includes:

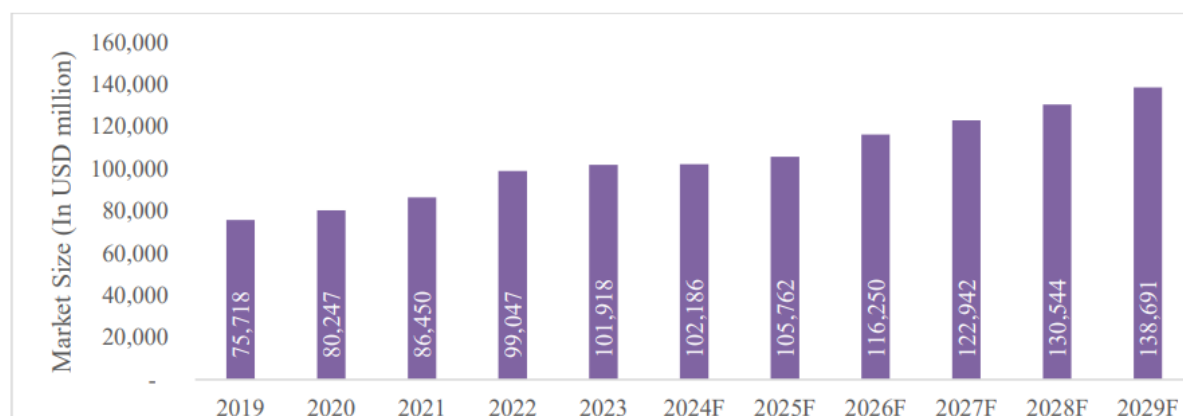
- ✓ Pesticides
- ✓ Bio stimulants

4. Global scenario – Crop Protection Current Market Scenario

During 2019-2023, the market size of the global crop protection industry grew at a CAGR of 7.7% on account of continuous growth in agricultural activities. After a steady growth till 2022, the industry observed a decline of about 2.4% in 2023 due to factors such as a slowdown in global demand, higher energy prices, and erratic monsoons. However, it is expected to grow by 2.2% y-o-y in 2024. The expansion will be attributed to the continuous upgrading of products and the development of technology and economic developments.

Further, Asia-Pacific (APAC), Europe and North America are the largest markets in terms of value owing to the rising demand for commercial farming and adapting to changes in crop mix. APAC region is well-known for its production of rice, soybeans, wheat, and horticultural crops such as fruits and vegetables, but it also faces issues that affect agricultural productivity due to a variety of weeds targeting staple and commercial crops. As a result, there is tremendous demand for crop protection chemicals. The rising use of pesticides and the adoption of sustainable farming methods in countries across this region are driving the demand for crop protection chemical. Whereas Europe is the second-largest market for crop protection, followed by North America. The robust growth in the USA and Canada is contributing to the increase in the North American region.

Global Crop Protection Industry Market Size:-

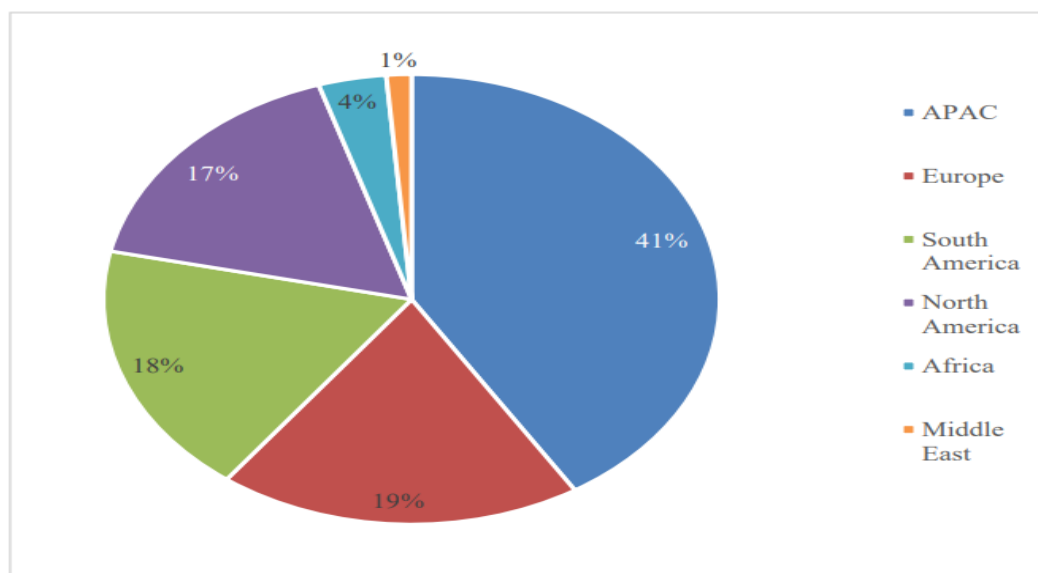


Source: CareEdge Research, Maia Research

Global Crop Protection Industry - Demand Across Regions:

The global crop protection market is expected to grow on account of a substantial increase in the production of food products worldwide. The rising consumption of food grains globally is expected to fuel market expansion. APAC region holds the maximum market share with 41% in consumption followed by Europe at 19%. South America and North America jointly accounted for 35% in 2023.

Region-Wise Global Crop Protection - Consumption Market Share in 2023.

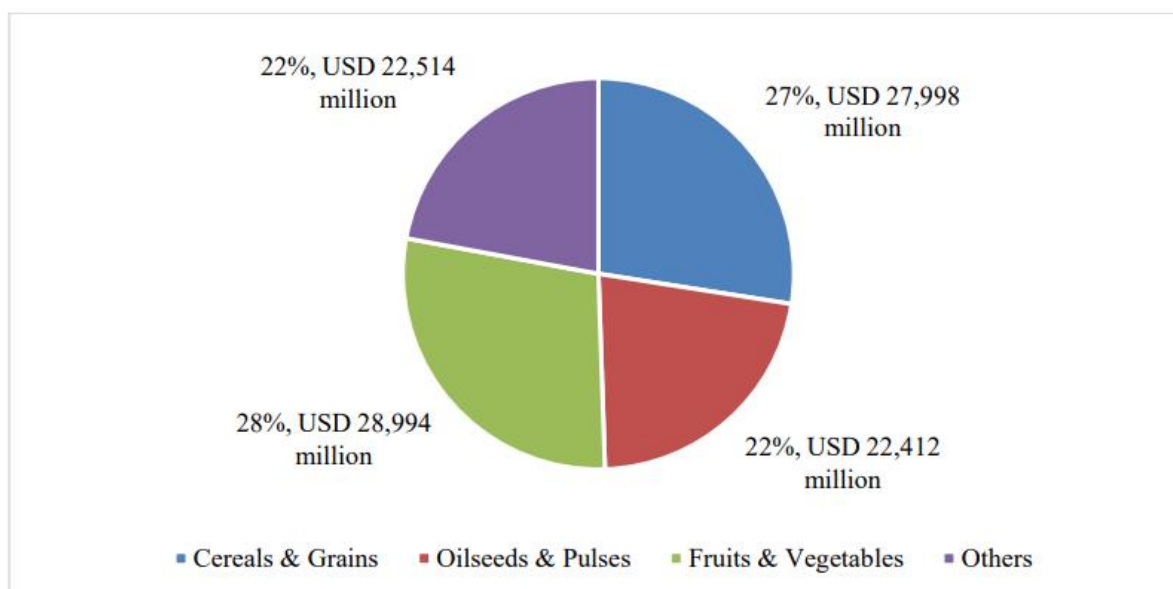


Source: CareEdge Research, Maia Research

5. An overview of Pesticides' role in Crop Protection

With regard to application, the fruits and vegetables segment dominates the market with a 28% revenue share, followed by cereals & grains whose share is about 27% as of 2023. The demand for cereals and grains such as wheat, rice, corn, oats, barley, and quinoa are rising, especially in Asia-Pacific, due to the growing population in India and China. Further, the amount of consumption of pulses, cereals, and grains in western region is increasing, attributed to the shifting consumer preferences, changing lifestyles, and adaption to nutritious food. Moreover, the consumption of fruits and vegetables is increasing due to growing health consciousness among individuals. Accordingly, pesticides are being used to maintain good quality and protect the crop from pests. Another category, oilseeds and pulses, which constitute 22% of the total revenue is contributing towards the increase in demand. Such factors are fuelling the demand for crop protection chemicals, playing a pivotal role in the advancement of these applications.

Share of Crop Protection Chemicals by Application in Global Market in Value Terms - 2023 (%) :-



Source: CareEdge Research, Maia Research

Segments and Structure of the Global Pesticides Industry:-

The global pesticide industry is dominated by the herbicides segment followed by the fungicides and insecticides segments. Of the global market size of around USD 69,044 million, herbicides accounts for nearly half of the crop protection industry globally, however it is on the lower side for India which is around 17% of the total consumption.

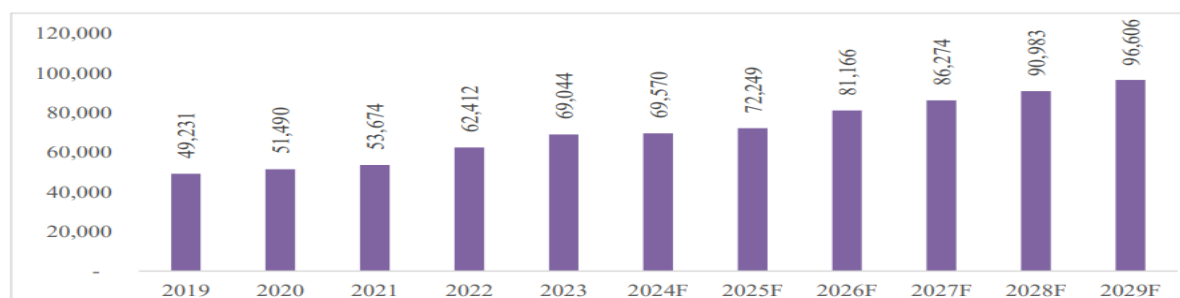
Apart from the crop market, another segment that has contributed to the global pesticides market includes the non-crop market. This segment had a market size of about USD 11 billion in 2023. These pesticides find their application in homes & gardens, turfs & ornamentals, pest control operations, industrial vegetation management, forestry, public health, and aquatic, among others. They are used for control of weeds, diseases, insects, and other pests. Also, they are used for plant growth regulation.

With the expected increase in the application of these pesticides on account of the benefits offered by them, the crop market is estimated to grow at a faster CAGR compared to that of global non-crop. Accordingly, the global non-crop market is expected to rise at a CAGR of about 4.1%-5% by 2028 and is estimated to reach the level of approximately USD 14 billion.

Trends in Global Pesticides Industry:-

During 2019-2023, the global pesticides market has grown at a CAGR of 8.8% from USD 49,231 million in 2019 to USD 69,044 million in 2023. The demand in the market has grown despite the geopolitical tensions and global supply chain issues due to which the prices of raw material prices rose high. However, in 2023, the demand remained subdued as the export restrictions were eased in China leading to increase in supply and also resulted in decline in prices.

Trend in the Global Pesticides Market (USD million):-



Source: CareEdge Research, Maia Research

India - Crop Protection Demand: -

The Indian crop protection market is poised for growth due to the growing demand for food products. The demand has grown substantially over the last decade on account of increased agricultural output, growing population, and favourable government initiatives such as Make in India and Aatmanirbhar Bharat Abhiyan. Despite challenges such as a slowdown in global demand, crop failures due to erratic monsoons, high energy costs, geo-political tensions, etc., consumption of nutrients and crop protection chemicals has increased in 2023.

Further, the rising population and depleting arable land are increasing the demand for food grains. The usage of nutrients and crop protection chemicals has increased to produce good quality crops and protect them from damage caused by pests and weeds. Also, environmental factors such as weather and rainfall patterns and warmer temperatures in various regions of the country have led to increased consumption of nutrients and crop protection chemicals and are expected to continue in future.

India - Agri-input Production by Type

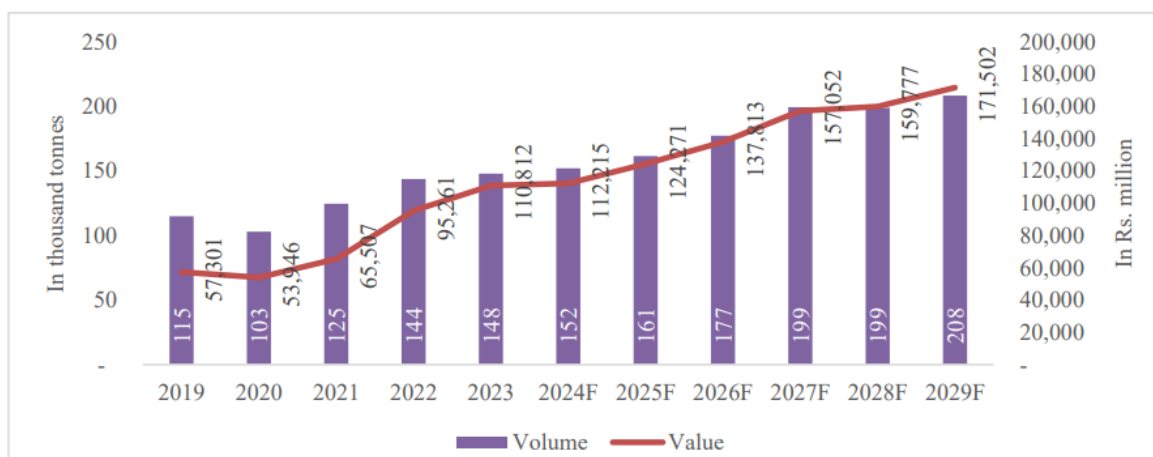
The production of agri-inputs in India increased at a CAGR of 16.4% from 689 thousand tonnes in 2019 to 1,267 thousand tonnes in 2023. Pesticides constituted almost 59% share in overall agri-inputs production and are projected to grow by CAGR 3.6% during the period, 2023-2029. Further, the overall agri-inputs production during the forecast period 2023-2029 is projected to grow with a CAGR of 6.9% on account of rising demand for agricultural use.

Production of Agri-inputs in India by Type (Thousand tonnes):-

Particulars	2019	2021	2023	2025F	2027F	2029F	CAGR 2019-2023	CAGR 2023-2029
Biofertilizer	111	315	450	591	735	873	41.8%	11.7%
Pesticides	514	624	745	781	856	922	9.7%	3.6%
Bio Stimulants	63	62	72	76	85	91	3.3%	4.0%
Total	689	1,001	1,267	1,448	1,676	1,886	16.4%	6.9%

The usage of pesticides has been increasing over the years. The demand is driven by the country's agricultural activities. Insecticides, fungicides, and herbicides are generally used for pest control in agriculture. In order to protect the crop from losses due to pests, farmers employ these chemical substances. These improve agricultural productivity and ensure food security in the country. The pesticide market in India, which registered a CAGR of 6.5% during 2019-2023, is projected to record a CAGR of 5.9% over the forecast period, 2023-2029. However, the growth in this segment may be impeded due to soil contamination, environmental concerns, and risks associated with health.

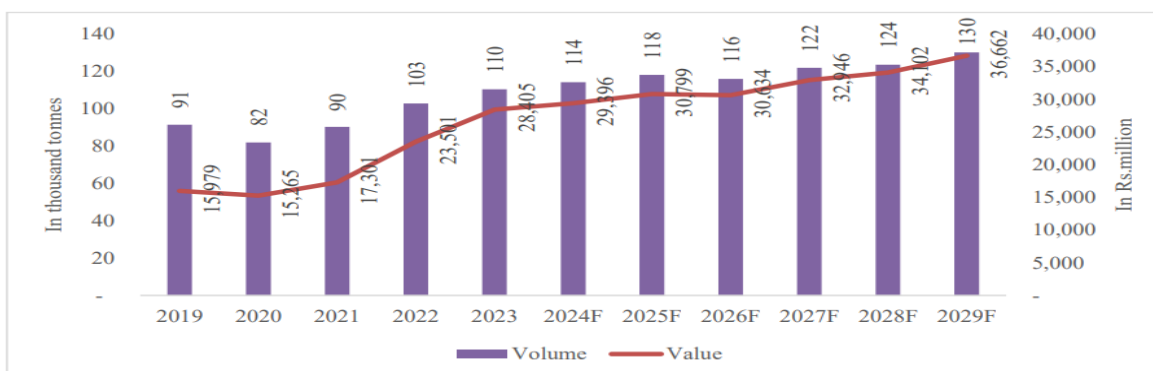
Consumption of Pesticides – India



Source: CareEdge Research, Maia Research

Bio stimulants are another sustainable way to enhance the yield of crops and not affect the environment. There is a rising need for organic farming in India to safeguard adequate food availability while not compromising on the health factor. These are biologically-derived substances applied to soil to improve nutrient uptake ability, and abiotic & biotic stress tolerance. The demand in this segment is expected to increase given the need for organic farming. Bio stimulants are projected to increase by a CAGR of 2.8% and 4.3% in volume and value terms, respectively, during the forecast period, 2023-2029.

Consumption of Bio stimulants – India



Source: CareEdge Research, Maia Research

Pesticides Industry in India

Evolution of the Pesticides Industry in India:

The evolution of pesticides in India was led by the Green Revolution. In 1943, India saw one of the worst food disasters during the Bengal famine. Food shortages have resulted in the death of around 40 lakh people in the eastern part of India. The problem of food shortage in India continued even after independence during different time periods and the frequent food scarcity issue led to the beginning of the Green Revolution in India.

The Green Revolution:-

The Green Revolution started around the world in several countries between the 1950s and the late 1960s. This resulted in various research technology transfer initiatives throughout the world, which in turn, focused on increasing agricultural production. The revolution started with Norman Borlaug's genetic testing. A hybrid wheat plant that could withstand diseases and fungi (in addition to high yield) was created by him. He is also known as the father of the Green Revolution.

Around the 1960s the Green Revolution was launched by the Government of India with the support of M.S. Swaminathan, a geneticist, who is now referred to as the father of India's Green Revolution. The revolution started in 1967 and continued till 1978.

The Green Revolution in India resulted in growth in agricultural production, primarily in the states of Haryana, Punjab, and Uttar Pradesh. The main achievement in this revolution was the development of a high-yielding variety of seeds of wheat and rust-resistant strains of wheat.

Aspects of Green Revolution in India:-

- High Yielding Varieties (HYV)
- Mechanization of Agriculture
- Use of Chemical Fertilisers and Pesticides
- Irrigation.

The Indian agrochemicals industry can be primarily divided into the following types:

Insecticide

Fungicides

Herbicides

Insecticides:-

Insecticides enable protection of the crops from insects by either preventing their attack or destroying them. They help in controlling the pest population below a desired threshold level.

They can be further classified based on their mode of action:-

Contact Insecticides: Insects get killed on direct contact with these insecticides and they leave marginal residual activity which affects the environment minimally.

Systemic Insecticides: Plant tissues absorb these insecticides and destroy insects when the insects feed on plants. These are generally related to long-term residual activity.

Fungicides:-

Fungicides are used to prevent fungi attacks on crops and to tackle crop diseases. Protectants and eradicants are two types of fungicides. Protectants protect or hinder fungal growth and eradicants destroy the diseases on usage. This results in better productivity, contraction in crop blemishes, and increased storage life.

Herbicides:-

Herbicides, also known as weedicides, are used to destroy unwanted plants. The unavailability of cheap labour leads to the major usage of herbicides in rice and wheat crops. The demand for herbicides is seasonal as they develop in damp, warm climates, and perishes in cold spells. They are of two types depending on the way of action, selective and non-selective. Selective herbicides destroy specific weeds not harming the desired crop and non-selective herbicides are used for widespread ground clearance to handle weeds pre-crop planting.

Based on the usage, there are three types of herbicides:

- Application prior to sowing of the crop (pre-planting)
- Application post-development of weeds (pre-emergence)
- Application right away subsequent to sowing (post-emergence)

Bio-Pesticides:-

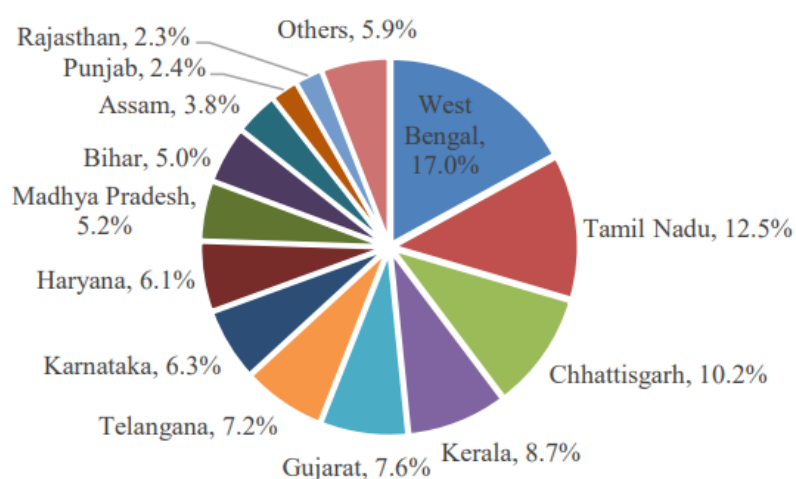
These are the new-age chemicals produced from substances of nature like plants, animal waste, bacteria, and minerals. Bio-pesticides have a small share in the agrochemicals market in India, which is expected to grow, backed by government support and increased awareness about pesticides that are eco-friendly. These pesticides are environment-friendly and easy to use.

This others segment comprises fumigants, bio stimulants, nematicides, rodenticides, and plant growth regulators (PGR). Plant growth regulators are chemicals used to modify and enhance plant growth such as increasing branching, suppressing shoot growth, increasing return bloom, removing excess fruit, or altering fruit maturity. Various factors such as how well the chemical is absorbed by the plant, tree vigour, and age, dose, timing, and weather conditions before, during, and after application affect the PGR performance. They prevent crops from attacking pests at the time of crop storage.

Current Trend in Bio-Pesticides Industry in India:-

The area available for agriculture largely is the same, catering to the growing population and rising demand. There was a dire need over the years to improve the crop yield and increase efficiency. Consequently, from 2019 to 2023, the area under cultivation has increased at a CAGR of 10%. Whereas the area under cultivation using biopesticides has increased at a faster CAGR of 21.7% during the same period. The usage of bio-pesticides has increased significantly on account of the various advantages it holds for the soil as well as crop yield

State-Wise Consumption of Bio-pesticides in India during 2022-23 (in %)

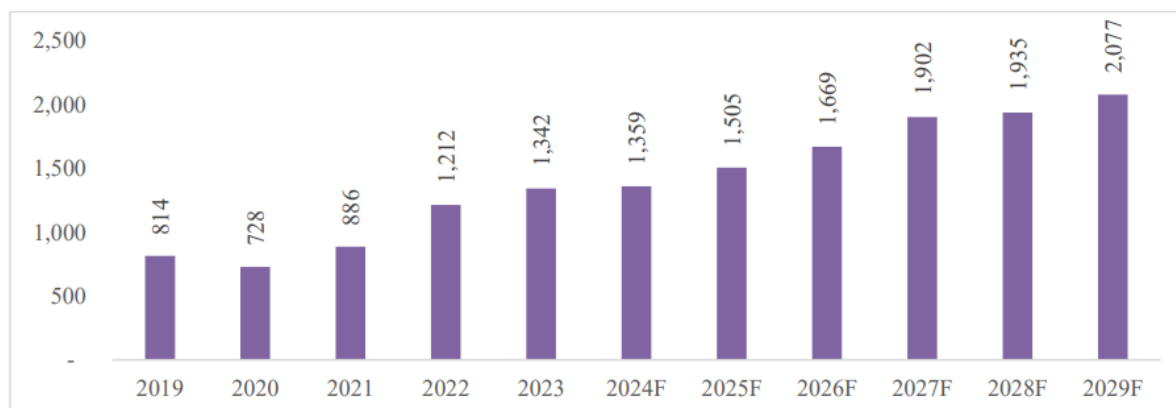


Source: CareEdge Research, Maia Research

Review of Domestic Pesticide Industry:-

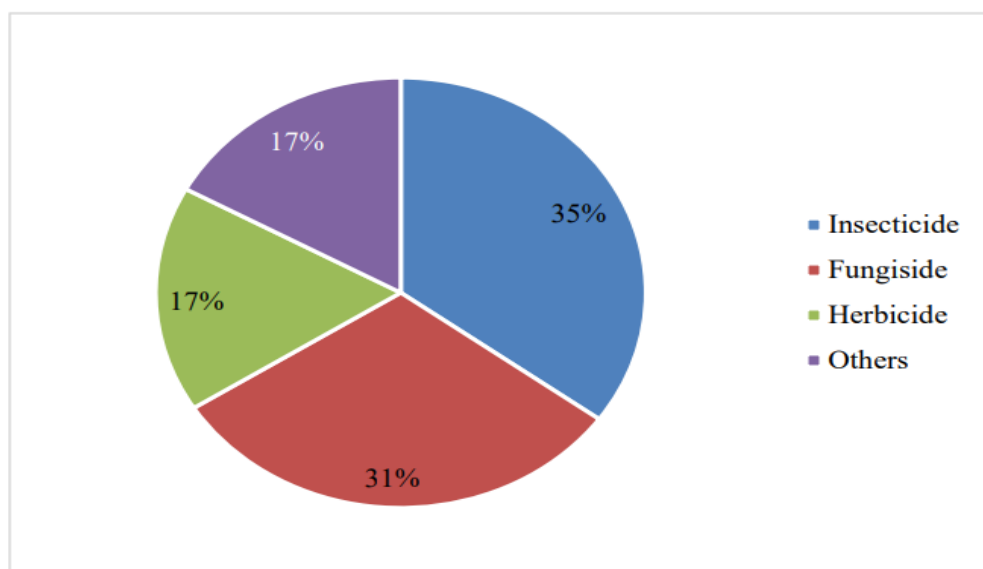
The overall Indian pesticides market grew at a CAGR of 13.3% from USD 814 million in 2019 to USD 1,342 million in 2023. It is projected to grow with a CAGR of 7.6% over the forecast period 2023-2029.

Indian Pesticides Industry (USD million):-



Source: CareEdge Research, Maia Research

Segment-Wise Share of Agrochemicals in Indian Market in 2023 (in %):-

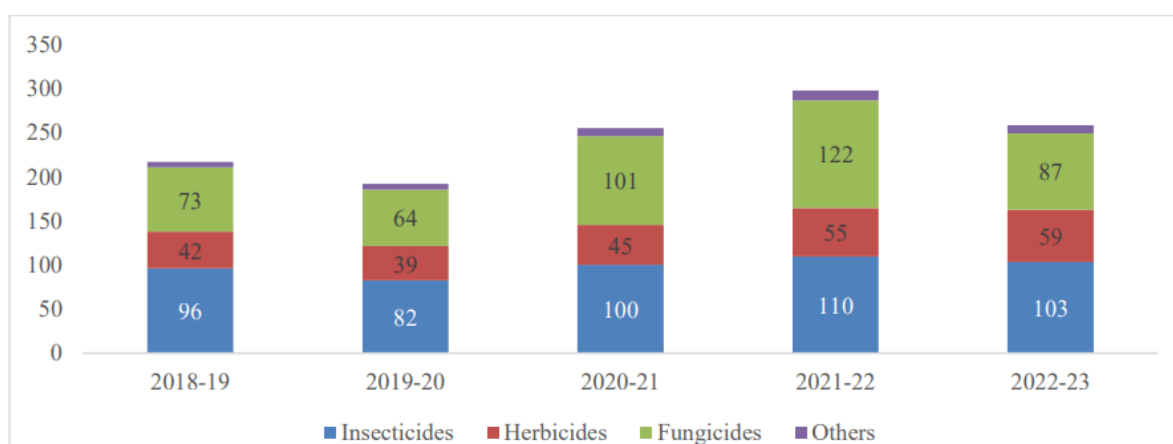


Source: CareEdge Research, Maia Research

Production of Pesticides in India:-

The output of pesticides in India (which includes 42 technical grades) increased at a CAGR of 4.5% from 217 thousand tonnes in 2018-19 to 258 thousand tonnes in 2022-23.

Trend in Production of Pesticides in India:-



Source: CareEdge Research, Maia Research
Directorate of Plant Protection, Quarantine & Storage

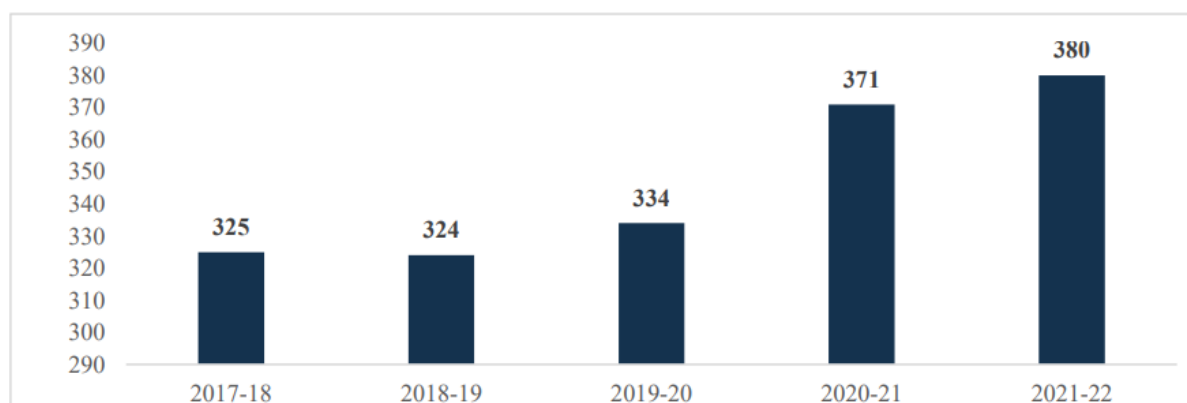
During 2022-23, the production of pesticides declined by 13.3% y-o-y to 258 thousand tonnes. The demand for pesticides from agriculture was also subdued globally and domestically, which is believed to be the reason for degrowth.

Production Capacity of Pesticides in India:-

The pesticide production capacity in India meets the domestic and export requirements of the nation. Over the years, the production capacity in India has increased at a CAGR of 4.0%. It has increased from 325 thousand tonnes in 2017-18 to 380 thousand tonnes in 2021-22.

It can be seen that the pesticide production capacity has grown in each of the years for the period 2018-2022 except for 2018-19, where the capacity declined by a marginal 0.3% to 324 thousand tonnes. It is important to note that the industry's capacity utilisation on average has been around 65% in these last five years.

Trend in Production Capacity of Pesticides in India ('000 tonnes)



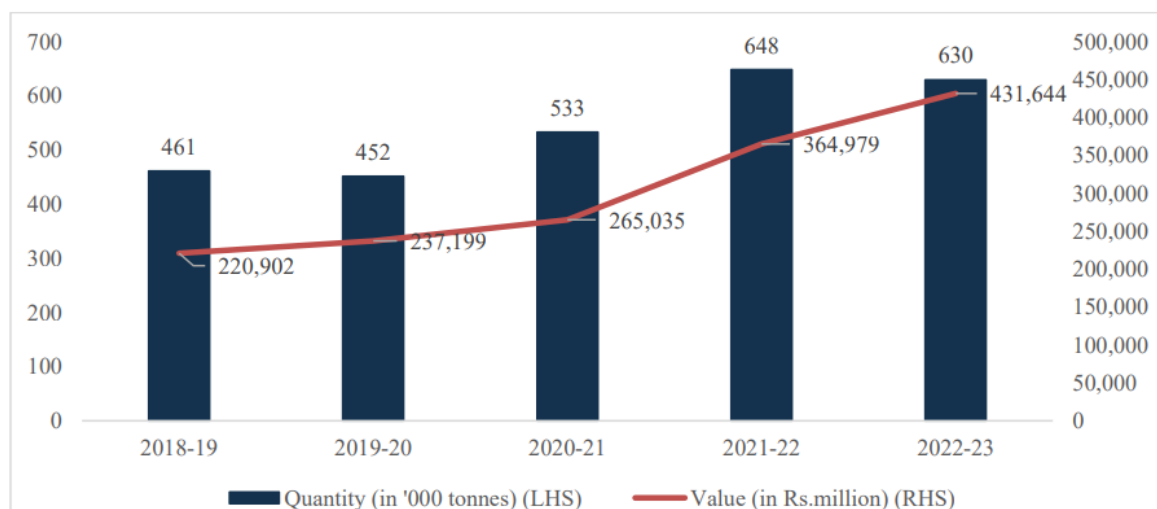
Source:-Directorate of Plant Protection, Quarantine & Storage

Trade Scenario of Pesticides in India:-

Trend in Pesticides Exports by India

India is a net exporter of pesticides and the outbound shipments account for a significant share of the total market size of the Indian agrochemicals industry. Exports of pesticides (technical and formulations both) grew at a CAGR of 8.1% from 461 thousand tonnes in 2018-19 to 630 thousand tonnes in 2022-23. It is to be noted that export CAGR increased at a faster pace compared to that of production, which grew at a CAGR of 4.5%.

Trend in Pesticides Export by India ('000 tonnes)

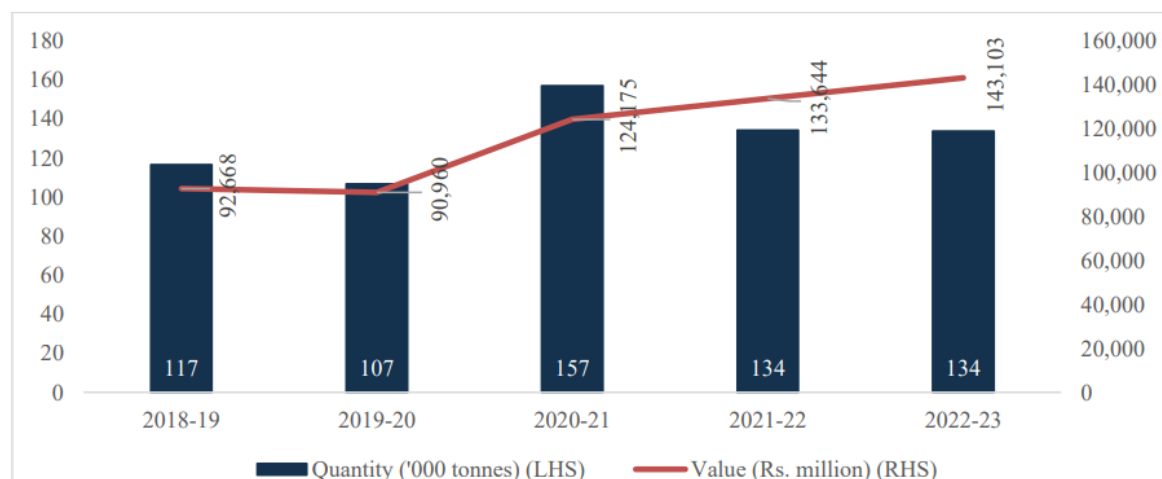


Directorate of Plant Protection, Quarantine & Storage

Trend in Pesticides Imports by India

The quantity of pesticides imported by India is quite less compared to that of the pesticide exports. However, the quantity of pesticides imported by India has increased at a CAGR of 3.5% during the period 2019-23. The imports increased to 134 thousand tonnes in 2022-23 from 117 thousand tonnes in 2018-19. The value of imports grew at a higher CAGR of 11.5% from Rs. 92,668 million in 2018-19 to Rs. 1,43,103 million in 2022-23.

Trend in Imports of Key Pesticides by India



Source: -Department of Chemicals and Petrochemicals

China is the major source of pesticide imports and accounted for more than half of India's total imports with a share of 51.97% during 2022-23. This was followed by the USA, Israel, and Taiwan, contributing 10.24%, 7.69%, and 6.91%, respectively. Other countries from which pesticides were imported included Thailand (a share of around 4%), while Singapore, Japan, and Belgium each accounted for 2-3% of the total pesticide imports by India.

Volume-Wise Top Source of Pesticides Imports for India 2022-23:-

Country	Share
China	51.97%
USA	10.24%
Israel	7.69%
Taiwan	6.91%

Segment-Wise Import Volume

Of all the pesticides segment imported by India, herbicides accounted for 19.8% followed by insecticides and fungicides with a share of 12.8% and 9.7%, respectively, on an average during 2018-19 to 2022-23. In terms of CAGR, while herbicides and fungicides grew in the range of around 10%-20%, the quantity of insecticides imported decreased at a CAGR of 1.5% during 2018-19 to 2022-23.

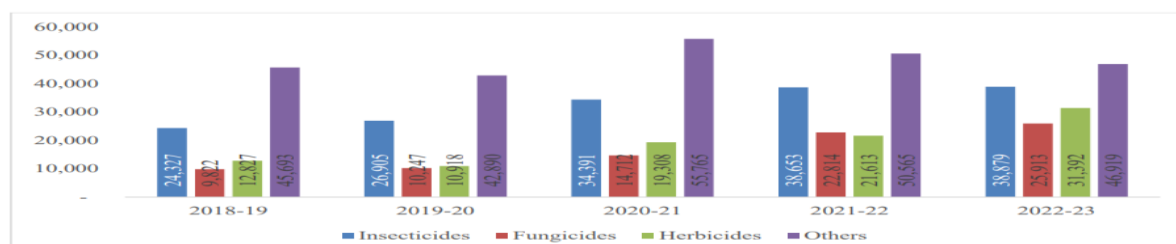
Segment-Wise Pesticides Import Volume ('000 Tonnes)

Apart from this, imports also include fumigants, plant growth regulators, and miscellaneous (where miscellaneous includes disinfectants, paper impregnated, repellent for insects, weedicides, weed killing agents, etc.) covered under the other segment. The component others accounted for the remaining share of 57.6% on an average during the period 2018-19 to 2022-23. It largely remained flat at 66 thousand tonnes in FY23 vs 69 thousand tonnes in FY19.

Segment-Wise Import Value:-

During the five-year period 2018-19 to 2022-23, insecticides, herbicides, and fungicides contributed about 27.9%, 16.4%, and 14.3%, respectively, in the overall import value of pesticides. The component others accounted for the remaining share of 41.4% on average in terms of import value.

Segment-Wise Pesticides Import Value (in Rs. Million):-



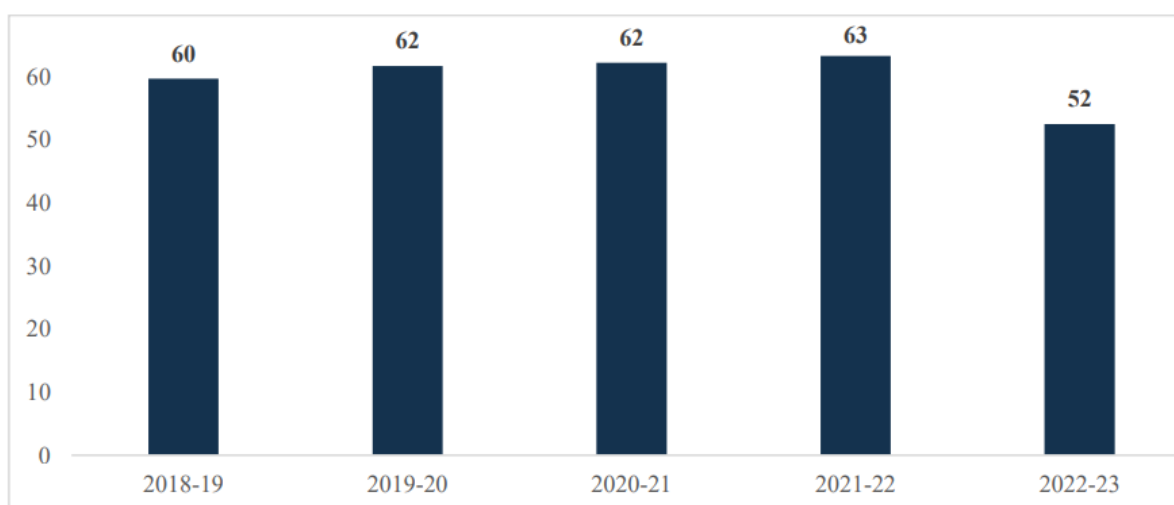
Source:-Directorate of Plant Protection, Quarantine & Storage

Review of Pesticide Usage Dynamics in India

Trend in Chemical Pesticides Consumption:-

The domestic consumption of chemical pesticides declined at a CAGR of 3.2% from 60 thousand tonnes in 2018- 19 to 52 thousand tonnes in 2022-23. This was due to the impact of new-age agrochemicals where the active ingredient or formulation was at a lower dosage per acre.

Trend in Chemical Pesticides Consumption in India (technical grade) ('000 tonnes)



Source:-Directorate of Plant Protection, Quarantine & Storage

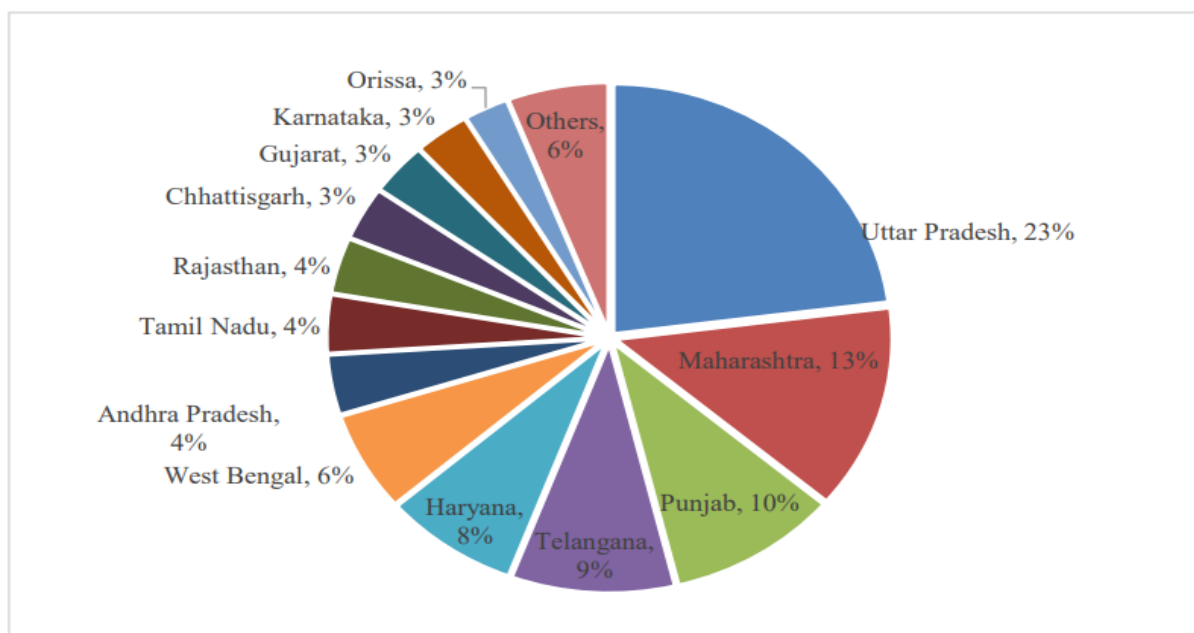
State-Wise Consumption of Chemical Pesticides in India

The top ten states and UTs that reported chemical pesticide consumption accounted for around 83% of the total chemical pesticide domestic consumption in India during 2022-23.

Of the total, Uttar Pradesh, Maharashtra and Punjab contributed to a significant share of 23%, 13% and 10.00%, respectively. Telangana accounted for around 9% of overall chemical pesticide consumption. Haryana, West Bengal, Rajasthan, Andhra Pradesh, Karnataka, Tamil Nadu, Chhattisgarh, Orrisa, and Gujarat contributed in the range of around 3%- 8%. Others (which include remaining states and UTs) accounted for 6% of the total chemical pesticide consumption during 2022-23.

State-Wise Consumption of Chemical Pesticides in India during 2022-23 (technical grade) (in %)

Source:-Directorate of Plant Protection, Quarantine & Storage



Source:-Directorate of Plant Protection, Quarantine & Storage

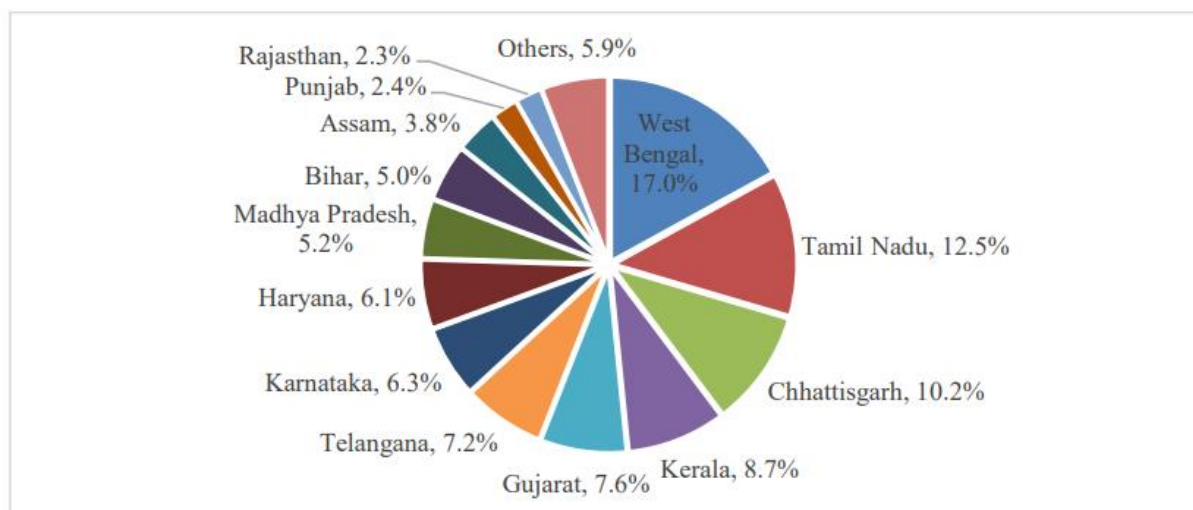
State-Wise Consumption of Bio-Pesticides in India

The top ten states' and UTs' bio-pesticide consumption accounted for around 86% of the total bio-pesticide domestic consumption in India during 2022-23.

Of these, West Bengal, Tamil Nadu, and Chhattisgarh contributed to a significant share of 17%, 12.5%, and 10.2%, respectively. Kerala accounted for around 9% of overall bio-pesticide consumption. Following this, Gujarat, Telangana, Haryana, Madhya Pradesh, Karnataka, Bihar, and Assam contributed in the range of around 3%-8%. Others (which include remaining states and UTs) accounted for around 6% of the total bio-pesticide consumption during 2022-23.

Due to warmer weather, the infestation by pests increases, thereby leading to increased consumption of biopesticides majorly in the top states.

State-Wise Consumption of Bio-pesticides in India during 2022-23 (in %)



Source:-Directorate of Plant Protection, Quarantine & Storage

Threats and Challenges:-

Distribution Systems:

The weak distribution system hinders the reach of agrochemicals to each and every remote area of the country. This, in turn, restricts its availability to the users that are spread at the remotest location in India. The industry requires efficient distribution through retailers to enhance its availability.

Spurious Products:

The unavailability of pesticides at different locations gives an opportunity for spurious products to make their way. The usage of these counterfeit products, in turn, may also affect the crops, thus harming the honour of the agrochemicals industry and its sales. Besides, the unawareness among farmers contributes towards the growth of such products.

Need of awareness:

More awareness among farmers with respect to the optimum and proper application of pesticides need to be grown. The companies, however, have been working toward increasing awareness about the usage of pesticides by farmers. They are educating the farmers about the benefits of agrochemicals and their safe usage. This is further expected to increase the demand for pesticides.

Competition:

The pesticides market is fiercely competitive with several domestic and international players. Companies face challenges on regulatory compliance including obtaining approvals and meeting safety standards. There is an increasing demand for innovation in environmentally friendly products. The companies must also ensure their products are

meeting the specific needs of various crops and regions. Additionally, establishing efficient distribution networks is crucial for gaining a competitive edge.

High entry barriers:-

Entry barriers include the high cost, complex regulatory approvals, intricacy of product development and manufacturing, lead time, expenditure required for R&D, building customer confidence and relationships which play a crucial role in shaping the business.

Growth prospect of Indian Pesticide Industry:-

The overall Indian pesticide industry is estimated to increase at a CAGR of around 8% during the period 2023- 29. on account of an upward growth expected in the international market and a likely increase in domestic usage of pesticides in India.

While the demand for India's pesticides is likely to remain high, India aims to strengthen the process of backward integration for industry. This is because India is dependent on China for some of the technical insecticides, and thus, any disruptions at this source destination (like a chemical plant shutdown in China to reduce pollution) have the

potential to affect India's supply chain. While such situations also provide an opportunity for India to increase the exports of pesticides, it does impact the supply chain of the industry. To avoid such instances, the Indian government said that it is considering increasing the scope of the Production Linked Incentive (PLI) scheme to include the domestic manufacturing of agrochemicals. If implemented, the scheme will result in increased competitiveness of domestic producers, and given the reliance on exports, benefits will help India increase its market share in the global agrochemicals markets. The scheme will also help the industry become self-sufficient and will be able to integrate backwards to produce its own technical-grade ingredients instead of relying on China for supplies.

Moreover, many countries across the world are looking forward to a 'China plus one strategy' to avoid excess dependence on China. The adoption of this strategy internationally will benefit India, as the countries that import pesticides from China may now opt for India, which is the 4th largest producer and 13th largest exporter of agrochemicals globally.

While the above-mentioned factors will support the Indian pesticide industry going forward, it is worth mentioning that the Indian pesticide industry remained resilient even during the pandemic year (2021-22) as exports from the Indian pesticide industry increased by a healthy 22% to 648 thousand tonnes and grew by 37.7% to Rs.365 billion on a y-o-y basis.

In addition, India has a competitive edge in terms of low labour costs and has support towards chemical clusters, which will also aid the growth of the agrochemical industry in the coming years.

Sources:-

Secondary data sources used.

National Centre for Organic and Natural Farming.

APEDA (Agricultural and Processes food products Export Development Authority)

State of Bio-fertilisers & Organic fertilisers in India, Centre for Science & Environment (CSE)

Directorate of Plant Protection, Quarantine & Storage

6. Key growth drivers

Key Growth Drivers of Crop Protection Industry:-

Agriculture:-

Agriculture is the primary source of livelihood for about 58% of India's population. As a result, the share of agriculture and allied sectors to the total economy's Gross Value Added (GVA) has been significant and has increased over the years.

As of 2022-23, the sector is the largest employer of workforce and accounted for a sizeable 15.1% in Gross Value Added (GVA) of the country. Growth in allied sectors including livestock, dairying and fisheries has also been the major drivers of overall growth in the sector.

Government Support:

The government provides aid to the rural economy through various budget announcements that aim at reviving rural areas and raising farmers' income. In addition, growth in credit facilities to farmers through institutional credit mechanisms and low-interest rate farm loans are likely to motivate farmers towards usage of pesticides that help increase the productivity and yields of crops. Besides, the increased minimum support price (MSP) of crops also may contribute to pesticide usage. Moreover, in the recent Union Budget 2022-23, the government promoted the concept of natural and organic farming, thereby encouraging the usage of environment-friendly agrochemicals.

Growth in Food Demand:

With the expected increase in population, the demand for food grain in India is likely to rise. Accordingly, the growing consumption needs are to be met with almost the same arable land. Thus, raising farm productivity becomes important and this can be done with optimal usage of products like agrochemicals. It is to be noted that per hectare consumption of pesticides in India is one of the lowest in the world.

Increasing Demand for Horticulture and Floriculture:

Fruits and vegetables have a significant share of around 90% of the Indian horticulture output. With increased consumption of healthy and nutritive foods, the demand for fruits and vegetables is likely to increase. This, in turn, is expected to support higher consumption of fungicides, which helps in contracting post-harvest losses in fruits and vegetables.

Growing Awareness of Bio-Pesticides:

The rising awareness with respect to the environment-friendly usage of agrochemicals and the use of integrated pest management (IPM) mechanisms are expected to encourage the application of biopesticides. The biopesticides market in India constitutes a small proportion, offering growth opportunities for the segment.

Off-Patent Molecules:

Any pesticide that goes off-patent provides an opportunity for the Indian industry to develop generic molecules. Such an event thus opens up opportunities for Indian manufacturers to increase their exports. An opportunity amounting to around USD 5 billion is estimated to go off-patent by FY27. This is likely to support pesticide exports from India going forward.

Export Markets:

The outbound shipments account for a major share of the Indian agrochemicals market and have grown at a CAGR of around 8.1% over the five-year period 2018-19 to 2022-23, thus driving the overall agrochemicals industry. These exports have not just supported the agrochemicals industry but also the overall chemical exports from India as the contribution of pesticides has been significant. To support the ambition of making India a USD 5 trillion economy by 2025, the Indian agrochemical industry is estimated to make outbound shipments of around Rs.385 billion by 2025. This target is also likely to encourage agrochemical/pesticide exports from India.

7. Key Government Initiatives

Agriculture being a state subject, the state government is primarily responsible for the growth and development of the agriculture sector developing perspective plans for their respective states and ensuring effective implementation of the programmes/schemes. However, the Government of India supplements the efforts of the State Governments through various schemes/programmes.

Details of various Government scheme:-

Rashtriya Krishi Vikas Yojana (RKVY): Under the Rashtriya Krishi Vikas Yojana (RKVY) Scheme of the Ministry of Agriculture, grants-in-aid is given to state governments on the basis of the projects approved in State Level Sanctioning Committee Meeting (SLSC). States can take up projects for the development of Agriculture and allied sectors in Public Private Partnership (PPP) for the Integrated Agriculture Component.

Chemical Promotion Development Scheme (CPDS):- Chemical Promotion Development Scheme (CPDS) is being implemented since 1997 in the Chemical Division of DCPC under Plan Head of Account. The aim of the Scheme is basically to extend soft support in the form of Grants-in-Aid (General) to various organisations / industry associations, etc.

Sub-mission On Agriculture Mechanization:- Agricultural machines take an important role to increase productivity with timely and precise fieldwork. To promote the usage of farm mechanization and increase the ratio of farm power to cultivable unit area up to 2.5 kW/ha, the scheme will be implemented in all the Indian states

Namo Drone Didi: The Government has approved the Central Sector Scheme 'Namo Drone Didi' for providing Drones to the Women Self Help Groups (SHGs) under DAY-NRLM, with an outlay of Rs. 1261 Crores. The scheme aims to provide drones to 14500 selected Women SHGs during the period from 2024-25 to 2025-2026 for providing rental services to farmers for agriculture purpose (application of liquid fertilizers and pesticides for the present). The Department of Agriculture & Farmers' Welfare has released the Operational Guidelines this scheme and all the stakeholders have been

Integrated Pest Management Scheme:- Integrated Pest Management Scheme provided by Department of Agriculture and Farmers Welfare, Ministry of Agriculture. The scheme aims at using pest control measures to keep the pest population below economic threshold level (ETL). Salient features of the scheme, such as regular pest surveillance and monitoring to assess pest, disease situation can be obtained. Contact details of concerned officials are also provided.

8. Key Market players and their performance in Agrochemical Sector in FY2023-24.

The agrochemical sector in India has exhibited a remarkable upward trajectory in recent years. Projections indicate that the industry will achieve a value of \$8.22 billion by 2024 and is anticipated to soar to \$13.08 billion by 2029, registering a compound annual growth rate (CAGR) of 4% from 2024 to 2029. Between the financial years of 2019 and 2023, the export value of India's agrochemicals experienced a swift ascent, growing at a CAGR of 14%, culminating in exports valued at \$5.4 billion in the financial year 2023.

Performance of Indian Agrochemical Companies in FY2023-24

FY2023-24 Rankings¹	Company¹	Revenue				Change% (in rupee)	Change% (in US dollar)
		FY 2023-24²		FY 2022-23³			
		₹ in crore	US\$ in million⁴	₹ in crore	US\$ in million⁵		
1	UPL	36,567.0	4,417.4	47,228.0	5,881.3	-22.6%	-24.9%
2	PI Industries	6,296.5	760.6	5,254.2	654.3	+19.8%	+16.3%
3	Bharat Group	2,798.2	338.0	2,693.3	335.4	+3.9%	+0.8%
4	Sharda Cropchem	2,639.0	318.8	3,348.0	416.9	-21.2%	-23.5%
5	Tagros Chemicals	2,609.0	315.2	2,521.0	313.9	+3.5%	+0.4%
6	Indofil Industries	2,600.3	314.1	2,544.8	316.9	+2.2%	-0.9%
7	Coromandel International	2,457.4	296.9	2,635.6	328.2	-6.8%	-9.5%
8	Krishi Rasayan	2,419.0	292.2	2,339.0	291.3	+3.4%	+0.3%
9	Crystal Crop Protection	2,230.0	269.4	2,597.0	323.4	-14.1%	-16.7%
10	Willowood Chemicals	2,127.6	257.0	2,076.4	258.6	+2.5%	-0.6%
11	Rallis India	2,000.7	241.7	2,414.4	300.7	-17.1%	-19.6%
12	Insecticides (India)	1,966.4	237.6	1,801.3	224.3	+9.2%	+5.9%
13	Best Agrolife	1,873.3	226.3	1,745.7	217.4	+7.3%	+4.1%
14	NACL Industries	1,780.8	215.1	2,116.0	263.5	-15.8%	-18.4%
15	Meghmani Group	1,770.8	213.9	2,690.5	335.1	-34.2%	-36.2%
16	Dhanuka Agritech	1,758.5	212.4	1,700.2	211.7	+3.4%	+0.3%
17	SML Group	1,560.0	188.5	2,050.0	255.3	-23.9%	-26.2%
18	Safex Chemicals	1,404.6	169.7	1,161.0	144.6	+21.0%	+17.3%
19	Heranba Industries	1,274.8	154.0	1,324.4	164.9	-3.7%	-6.6%
20	GSP Crop Science	1,226.0	148.1	1,309.4	163.1	-6.4%	-9.2%

Notes:

1. The rankings base on the Fiscal Year 2023-24 revenue (in rupee) of pesticide products (TCs & Formulations) of Indian native enterprises, excluding the branches of multinational companies in India.

2. Fiscal Year 2023-24: from April 1, 2023 to March 31, 2024

3. Fiscal Year 2022-23: from April 1, 2022 to March 31, 2023

4. Data was converted by using the average annual exchange rates between the US dollar and the rupee for FY 2023-24

5. Data was converted by using the average annual exchange rates between the US dollar and the rupee for FY 2022-23

Disclaimer: Data was provided by the enterprises and/or from their financial reports. The data and the rankings in the list are only for reference, they do not constitute and should not be considered as investment advice or a recommendation to buy, sell or otherwise transact in any investment, including any products or services or invitation, offer or solicitation to engage in any investment activity.

Source:-Company annual Report

9. Future outlook Agro Chemical (Crop Protection) Industry

Final Words:-

India's agrochemical industry has experienced remarkable growth in recent years. It has established itself as a key player in the global market. With a strong focus on partnerships and regulatory compliance, India is set to address both domestic agricultural needs and global challenges effectively. The country's increasing income levels and youthful population are driving a consumption-driven economy. This leads to increased demand across various sectors. This situation enables Indian manufacturers to offer competitive pricing for generic agrochemicals. Thus, attracting global attention and driving export volumes. India's reputation for cost-effectiveness and product quality positions it as a preferred destination for agrochemical manufacturing. The "Make in India" initiative by the government has also played a crucial role in advancing the agrochemical industry by promoting domestic manufacturing, reducing regulatory barriers and facilitating infrastructure development. Additionally, initiatives like Aatmanirbhar Bharat Abhiyan highlights the importance of self-reliance and resilience in key sectors like agrochemicals. This aims to reduce dependency on imports and enhance competitiveness. The proposed production-linked incentive system for the agrochemical sector is also expected to further boost domestic manufacturing, create employment opportunities and elevate the country's global competitiveness. India's strict laws and regulations regarding chemical manufacturing, particularly fertilisers and pesticides, have earned global recognition. Mandated by the Insecticides Act of 1968 and The Insecticide Rules of 1971, India implements meticulous checks and balances before releasing pesticides into the market. Overseen by the Central Insecticides Board and Registration Committee, operating under the Industries (Development and Regulation) Act of 1951, ensures adherence to global standards. Such adherence to strict regulations not only ensures the safety of humans and animals but also builds trust among consumers worldwide. This reinforces India's reputation as a reliable source of high-quality agrochemicals.

Future of Agro Chemical Export:-

India's agrochemical exports are projected to exceed Rs. 80,000 crore (US\$ 9.61 billion) over the next four years, contingent upon a supportive industry environment, according to a report by the Agro Chem Federation of India (ACFI) and EY. The report highlights that agrochemical exports reached Rs. 43,223 crore (US\$ 5.50 billion) in the 2022-23 fiscal year, surpassing domestic consumption. To achieve this growth, the report emphasizes the need for government action, including streamlining licensing processes, enhancing storage and sales infrastructure, incentivizing biopesticide production, and simplifying the registration of new products. ACFI also advocates for trade agreements with countries that have relaxed maximum residue level (MRL) norms and suggests reducing the Goods and Services Tax (GST) on agrochemicals from 18% to 5%.

Despite being the fourth-largest global producer of agrochemicals, India still relies heavily on imports, particularly from China. The report notes that India's agrochemical usage is lower than the global average, with just 400 grams per hectare compared to 2.6 kg per hectare worldwide. The "Make in India" initiative is a crucial opportunity to address these challenges and position India as a global agrochemical manufacturing and export hub.

Best Regards,

Uday
TG

Digitally signed
by Uday TG
Date: 2024.12.23
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T.G Uday
Associate Director,
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