

July – September 2023





# **OPENING CEREMONY OF NEW MARKETING OFFICE SPACE**

CEO Nitin M Kantak opened the new office space of Ballari and Hubballi Regional Marketing Offices on 17 and 18 July 2023. Mr. Kantak was joined by M. T M Muralidharan, Mr. P T Sudarshana, Mr. Chetan Rohan Mendonca and Mangala Channel Partners.

MCF took this opportunity to engage with Mangala



Opening of Ballari marketing office space by CEO

Channel Partners, gaining invaluable insights into the current agricultural situation and the prospects for fertilizers in the upcoming seasons. This interaction not only allowed us to share our vision but also fostered a deeper understanding of the needs and challenges faced by our partners on the ground.



Opening of Hubballi marketing office space by CEO



CEO with Ballari region Channel Partners in the new marketing office



CEO with Hubballi region Channel Partners in the new marketing office



Channel Partner's Meet – Ballari



Channel Partner's Meet – Hubballi



# **The CEO Speaks**



Dear Colleagues and Mangala family members,

At the time of writing this, I am sure that most of you are eagerly looking forward to the upcoming festival season after the monsoon. Our festival season coincides with a time when nature is lush green and bountiful after the rains.

In the first quarter, MCF registered an impressive 2.08 lakh MT of fertilizers sales. This is about 34% more over the last year. Our N20 sales have increased by 45% to 57,000MT in the first quarter. Our market share of N20 has increased from 11% to 25% year-on-year in Karnataka, where we sell about 71% of our fertilizer products.

On the plant operations front in Q1, our Urea plant continues to run at 1350TPD after AEIP. The DAP/N20 daily production has increased dramatically from 900TPD to 1300TPD. We have achieved a 35% higher production in phosphatic fertilizer manufacturing when compared with Q1 of the previous year. We have also imported about a lakh MT of DAP / NPK / MOP to supplement the target to achieve a 1 million tonne sale of fertilizers this year. I am very happy to inform you that we have been able to convert our entire production and imports to primary sales thus achieving 100% railhead sales.

We have delivered excellent results in Q1 of the current financial year. EBITDA has increased by 80% to Rs.124 crore and the PAT has also increased by 113% to Rs.49 crore when compared to the performance in Q1 last year. This impressive performance is due to our strategic initiatives, improved product mix and efficient cost management. I heartily congratulate the entire MCF team for these spectacular results. Let us keep up the momentum to achieve even greater magnificent results in the days ahead.

I am excited to announce to you that the Board of Directors have accorded their approval to set up a 300TPD Sulphuric Acid plant with a capital investment of Rs. 240 crores. The new Sulphuric acid plant will also generate HP steam through waste heat which will be utilized in the Ammonia plant that will bring down the Urea energy consumption by 0.25 GCal/MT. The

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financial closure is expected to be completed very soon and the project will be kick-started in October 2023. Installation of the new plant will happen in May 2025.

Our Ammonia plant will be operating at full load after replacing the tubes of the Primary Reformer in Ammonia plant in October 2023. After the plant turnaround, we will be reaping the full benefits of AEIP – increased Ammonia production of 880TPD and achieving the intended energy consumption benchmark of 5.5GCal/t of Urea.

Employees are the foundation of every successful business. Learning & Development Centre has launched an exciting initiative that will enrich our learning and development journey. LinkedIn Learning presents an opportunity for employees to further their personal and professional growth; employees can acquire new skills and keep themselves abreast of the new technologies and developments happening around the world. Another unique initiative is the MCF Youth Council Board. YCB is a unique initiative aimed at fostering leadership skills and providing valuable insights to the next generation of leaders within our organization. After a rigorous process, five young promising employees have been selected for a two-year stint at MCF YCB.

I am very happy to note that the Jnana Jyothi initiative of Mangala Vartha has achieved its desired outcome of educating the illiterate women janitors and gardeners working in MCF. An initiative like Jnana Jyothi shows the commitment of MCF to bettering the lives of even the contract workforce who contribute to the progress of the organization indirectly.

Looking ahead we remain optimistic about the future performance; we are confident about achieving sustainable growth and creating long-term values for all our stakeholders.

*I* wish the festival season brings happiness, prosperity and good fortune to you and your family.

Best Regards **Nitin M Kantak** 



# **EDITORIAL**

About 71% of the surface of the Earth is covered by the ocean, making them a dominant feature of the Earth's geography. The vastness of the sea is often seen as a symbol of mystery, exploration, and the unknown.

India has a rich maritime heritage and the earliest reference to maritime activities is contained in the Rig Veda. The Rig Veda is the oldest evidence on record that refers to Varuna, the Lord of the Sea, and credits him with the knowledge of the ocean routes which were used by ships. A study of the country's maritime history reveals that the Indian sub-continent exercised supremacy over the Indian Ocean from very early times up to the 13<sup>th</sup> century. Indians took to the sea for trade and commerce rather than for political ends. The Indian Ocean has always been regarded as an area of great significance and India is central to this ocean. The Indian maritime history begins with the Indus Valley Civilization in 3000 BCE; its inhabitants had maritime trade relations with Mesopotamia. The Cholas were one of the very few thalassocracy empires in the world; their influence extended to the east up to Palembang (Sri Vijava) in present-day Indonesia and trade routes as far as East China.

The Age of Discovery, from the 15<sup>th</sup> to 17<sup>th</sup> century, resulted in new sea routes, oceanic trade, commercial practices, and the exchange of culture, ideas, technology and above all the colonization of Asia, Africa and the Americas by the Europeans. The most prominent of these discoveries were the chance discovery of America by Christopher Columbus instead of India, and the new sea route to India by Vasco da Gama. It is the discovery of the sea route to India that led to the arrival of European powers to India. The British came to the Indian shore as East India Company in 1608 as traders and colonized India after the Great Sepoy Mutiny in 1857. The ocean presented a wealth of riches and resources to the outsiders coming to India – the Portuguese, the British, the Dutch, the Danes, and the French.

The Sea of Opportunities

Seas play a crucial role in various aspects of human life. They have historically served as trade routes, sources of food, and centres of cultural exchange. Just as vast as the sea, there are many opportunities that the seas and oceans present to humans. Different kinds of industries such as marine transportation and shipping, fishing and aquaculture, marine tourism, marine energy, marine research and technology, shipping and ports, mineral resources, environmental services, marine biotechnology, and coastal infrastructure development are dependent on the seas and oceans surrounding the landmass. The sea economy's potential benefits are vast, but it also presents challenges related to sustainability, environmental protection, and resource management. Fisheries and aquaculture involve the harvesting and cultivation of marine and freshwater organisms, such as fish, shellfish, and aquatic plants. These sectors provide a significant source of food, income, and employment for communities worldwide. The sea economy includes various forms of

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renewable energy derived from the ocean, such as offshore wind farms, tidal energy, and wave energy. These sources have the potential to contribute to sustainable energy production. Seaports serve as gateways for trade and transportation, facilitating the movement of goods between land and sea. They are critical nodes in the global supply chain and contribute significantly to economic activity. The sea economy also includes the potential extraction of minerals and resources from the ocean floor, such as polymetallic nodules, Manganese, and oil and gas deposits. The ocean also provides valuable ecosystem services, including carbon sequestration, nutrient cycling, and climate regulation. These services have economic implications for industries and countries that depend on a stable environment.

The cover page photo shows a fishing boat venturing out into the choppy ocean. The boat has set out into the jade-green waters in hopes of a good catch of fish, one of the multifarious opportunities presented by the ocean. This is the everyday story of the countless fishermen around the world, who are dependent on the ocean and seas for their livelihood.

Remember, while the metaphor of a 'sea of opportunities' is inspiring, it's important to approach these opportunities with careful consideration, planning, and effort. Just as the sea can be both rewarding and challenging to navigate, seizing opportunities requires thoughtful decision-making and hard work.



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# **MCF and The Sea Economy**

The Sea, which covers 71% of the Earth's surface, is essential for the global economy and cradles endless possibilities. Sea shipping is a major way that goods are transported around the world, and it is responsible for transporting over 80% of all goods, which is equivalent to about 11 billion tons traded internationally. This means that the smooth flow of seaborne trade is essential for maintaining economic growth and prosperity around the world.

As we delve into the heart of MCF's operations, we uncover the crucial role the sea economy plays in our business. Strategically located adjacent to the New Mangalore Port, our operations are intricately woven into the rhythm of the sea. Our import of major raw materials, including Ammonia and Phosphoric Acid, forms the key input to our fertilizer production.

#### Navigating Modern Waters - The Suez Canal's Impact

The inauguration of the Suez Canal in 1869 was one of the most iconic achievements in maritime history. The birth of the Suez Canal was rooted in the visionary aspirations of individuals like Napoleon Bonaparte. Napoleon recognized the strategic potential of a shortcut that would link Europe and the East. Although his efforts were not realized during his time, Frenchman Ferdinand de Lesseps championed the transformation of Napoleon's dream into reality. The impact of the Suez Canal resonated globally. For Britain, the Suez Canal assumed extraordinary significance in its colonial pursuits. The canal drastically shortened the distance between England and its representatives in India, revolutionizing trade, communication, and military logistics. However, complexities emerged, from managing passage rights to ownership. The Suez Canal became a tripping point, shaping global dynamics.

Ferdinand de Lesseps's legacy led him to undertake the Panama Canal project in 1881 that would connect the Atlantic Ocean to the Pacific Ocean, bypassing the Isthmus of Panama. However, it faced engineering setbacks and turned out to be a financial disaster. In 1904, the United States took over the Panama Canal project. The Americans were able to overcome the challenges and the canal was completed in 1914. The Panama Canal is a major engineering marvel, and it has had a significant impact on global trade.

As the 20th century dawned, Egypt nationalized the Suez Canal, which led to the Suez Crisis. The crisis ended with the canal remaining under Egyptian control but with the United Nations guaranteeing its neutrality. The canal was closed again during the Six-Day War, but it was reopened in 1975. The new Suez Canal was opened in 2015, and it has increased the capacity of the canal significantly.

The Suez Canal is an important international navigation canal fertilizers. Another major raw material is natural gas. All the linking the Mediterranean Sea at Port Said and the Red Sea at gas currently imported to India is liquefied natural gas (LNG).

Suez and is considered to be the shortest link between the East and the West due to its unique geographic location as compared with the Cape of Good Hope, resulting in timesaving and reduction in fuel consumption and overall ship operating costs. The Suez Canal is one of the most important waterways in the world. The canal is extensively used by modern ships. Tolls paid by the vessels form an important source of income for Egypt. The Suez Canal exemplifies how a single waterway can reshape the world's fortunes, underlining the intricate interplay between geography, commerce, and politics.

# Containerization and tanker ships and their impact on global shipping

Containerization, a seemingly simple idea, has revolutionized the way goods are transported across the world. The brilliance of containerization lies in its simplicity i.e., the standard size of containers being 8 feet wide and 8.5 feet tall, with length being 20 feet. This uniformity coined a new unit of measurement for the logistics industry - The twenty-foot Equivalent Unit (TEU). Container ship capacity is now quantified in terms of the number of TEUs it can carry, with a 40-foot container equivalent to 2 TEUs. Vessels range in size, and some of the largest ones are capable of accommodating around 20,000 TEUs – such was the staggering impact of containerization on sea trade.

Although shipping container dates back to 1956 they found traction in the 1970s during the Vietnam War as the US recognized the efficiency of containers advantage being intermodal transportation, enabling efficient transfers of goods from trucks, rail, and ships. This eliminated loading and unloading delays, resulting in faster deliveries and reduced costs which proved to be a game-changer for the US military at the time.

The size of shipping containers has evolved from the original 8 feet by 20 feet to the 40,48,53-foot length and some containers are refrigerated called reefers. The most commonly used ships in the global trade are 1) Container ships, 2) Dry bulk carriers used for moving bulk cargoes like fertilizers, grains, coal, and iron ore, 3) Tankers ships for transporting liquids and gas like Ammonia and Phosphoric Acid, LNG, crude oil etc., 4) General cargo ships for transporting equipment, and 4) RoRo ships for carrying cars, buses trailers etc.

### MCF and sea operations

MCF is strategically located adjacent to the New Mangalore Port, called a gateway to Karnataka. While manufactured Ammonia is used in Urea production, imported Ammonia and Phosphoric Acid are used in the manufacture of complex fertilizers. Another major raw material is natural gas. All the gas currently imported to India is liquefied natural gas (LNG).

operating terminals where it is re-gasified. MCF receives NG various trade routes and geographical considerations. supply from the Kochi terminal through KKBM gas pipeline.

In terms of the value of materials consumed, imported Phosphoric Acid from African nations utilize the Suez Canal Ammonia, Phosphoric Acid, and natural gas collectively route. This iconic waterway facilitates a shorter and more account for over 90%. This underscores the significant role efficient journey. On the other hand, Phosphoric Acid, dry bulk, that sea operations play in shaping MCF's economic landscape. The Imported Ammonia & Phosphoric Acid Terminal (IAT) strategically positioned close to the NMPA facilitates direct



unloading from ships to storage tanks in IAT. This streamlines the import process, and optimizes costs by minimizing intermediate storage and transportation. Additionally, MCF's leased Sulphuric Acid storage tank at the IMC, Mangalore terminal is used for storing imported Sulphuric Acid.

MCF has strategically diversified its sources for essential raw materials, ensuring a robust supply chain. The primary source of Ammonia is the Middle Eastern countries, while Phosphoric Acid is procured from diverse origins such as African Nations and Southeast Asian countries like the Philippines and Vietnam. This well-thought-out approach mitigates risks associated with dependency on a single source and enhances the company's resilience in the face of market fluctuations. Typical lead time for procurement ranges from 30 to 45 days for these imports.

MCF also imports a variety of dry bulk materials that are vital to its operations. Among the dry bulk materials imported are MOP, DAP, Ammonium Sulphate, and technical-grade Urea. In addition to its bulk cargo imports, MCF also engages in imports of containerized cargo, which includes water-soluble fertilizers for Specialty Fertilizers, crude Naphthalene and Sodium Gluconate for Sulfonated Naphthalene Formaldehyde production.

MCF's import operations extend beyond its strategic location near New Mangalore Port. The company has also expanded its footprint to other major ports such as Kakinada and Krishnapatnam. This diversification in import destinations showcases MCF's commitment to optimizing its supply chain and catering to a wider network of customers. This approach not only reinforces the company's reliability in meeting market

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The Government of India imports LNG in tanker to its demands but also demonstrates its adaptability in managing

Materials sourced from the Middle East, such as Ammonia and containerized cargo from Southeast Asian countries route traverses the South China Sea, a region known as one of the world's busiest waterways.

Bevond the fundamental aspect of transporting essential raw materials, during the Ammonia Energy Improvement Project, the transportation of heavy and critical equipment was an important phase for the timely completion of the project. For instance, the transportation of heavy cargo like the Ammonia add-on converter and CO<sub>2</sub> stripper required a unique approach. MCF employed a multi-modal transportation approach utilizing barges for the initial part of the journey to New Mangalore Port and transferring trailers from the port to our site. In addition to the barge transportation, MCF also managed the shipment of the Synthesis Gas Compressor, a critical piece of equipment via sea transport.

In addition to the diverse range of logistical solutions, MCF is committed to exploring new avenues for transportation. One such instance is the movement of aqueous Formaldehyde in ISO tank containers from Gujarat to NMPA which not only optimized costs but also helped broaden the base of our supplier source.

The sea operations don't stop at the harbour's gate. Meticulous documentation, customs clearance, and timely unloading are integral to the successful execution of every shipment that contributes to steering the oar of MCF's business.

While the sea offers a vast realm of opportunities, it also presents its fair share of challenges. The Ever Given incident in the Suez Canal serves as a stark reminder of the vulnerability of global supply chains to unforeseen disruptions. Geopolitical tensions and conflicts, such as the Russia-Ukraine can have far-reaching impacts on trade routes, highlighting the need for resilience and adaptability in navigating the dynamic currents of international commerce. Moreover, the issue of climate change has added another layer of complexity. Rising sea levels and extreme weather events become more frequent, sustainability has taken centrestage as an imperative consideration in shipping.

The sea economy's pivotal role in shaping our history, present, and future is indisputable. MCF operations and its connection to the sea go beyond mere logistics. It symbolizes our unwavering dedication to embracing efficiency, driving innovation, fostering sustained growth, and making a positive impact on the communities we touch.



# **Fishing Sector in India**

shing is one of the world's oldest hunting methods and Neendakara and Vizhijam in Kerala, Tuticorin, Nagapattinam food gathering. It is believed that early humans began fishing for food as early as 40,000 years ago. The first recorded instance of fishing dates back to around 30,000 BC, when a group of Neanderthals were caught trying to fish in a river in Germany. Today, fishing is a vital source of food and income for many people around the world.

The history of fisheries in India dates back to the days of the Harappan Civilization. Reference to fish, its trade and the fisher community are found in the Songs of the Sangam Age. Fishing as an occupation is mentioned in Kautilya's Artha Shastra and Manasollasa composed by the Kalyani Chalukya king Someshwara III. Currently, India is the third largest fishproducing country in the world and accounts for about 8% of global fish production. The fisheries sector plays an important role in the national economy and the sector has been one of the major contributors of foreign exchange earnings, with India being one of the leading seafood exporting nations in the world. As for the overseas market, the USA is the major importer of Indian seafood. India is also a major producer of fish through aguaculture and ranks second in the world after China. The Indian fisheries sector provides livelihood to about 1.6 crore fishers and fish farmers at the primary level and several lakhs along the value chain.

More than 10% of the world's fish and shellfish species are in India's rich and diverse fisheries, including deep seas, lakes, ponds and rivers. Fishing resources in India are divided into two broad categories - Inland resources and Marine resources. Inland resources consist of a total area of 7.6 million hectares that includes area under reservoirs (3.15 million ha), ponds and tanks (2.45 million ha), brackish water (1.24 million ha), floodplain lakes (1.2 million ha), and about 2.8 lakh km length of rivers and canals. Marine resources are along the 8,118 km coastline of India that includes 2.02 million sg. km area under the Exclusive Economic Zone (EEZ), 0.53 million sg. km of Continental Shelf, 1,457 noticed fish landing centres and 3,461 fishing villages along the coastline.

The trend analysis of the Indian fisheries sector reveals a paradigm shift from Marine dominated fisheries to a scenario where Inland fisheries have emerged as a major contributor to the overall fish production in the country. For example, out of the 162.48 MMT fish production in 2021-22, Inland fisheries contributed nearly 120 MMT and the rest by Marine fisheries. There are 10 main fishing harbours in India, and they are at Mangaluru in Karnataka, Chellanam, Vypeen, Koyilandy, and transportation infrastructure result in post-harvest

and Chennai in Tamil Nadu, Vishakapattanam in Andhra Pradesh, and Raichak in West Bengal. Of these, Koyilandy Harbour is the largest fishing harbour in Asia with the longest breakwater. Andhra Pradesh, West Bengal, Gujarat, Odisha and Tamil Nadu are the leading fish-producing states in India.

The Union Government of India supplements the efforts of the States/UTs for the development of the fisheries and aquaculture sector. The Inland sector is by and large, fully in the domain of State Governments while the Marine sector is a shared responsibility between the Central and Coastal State Governments. Coastal States/UTs are responsible for the development, management and regulation of fisheries in the sea waters within 12 nautical miles (22 km) from the baseline. Central Government is responsible for the development and management of fisheries in the EEZ waters beyond 12 nautical miles. In May 2019, the Government of India created a separate Ministry of Fisheries, Animal Husbandry and Dairying (MoFAHD) headed by a cabinet rank minister.

Fishing is an all-year activity. However, every year, the President of India on behalf of the Department of Fisheries under MoFAHD issues a ban on all fishing activity on the east coast (West Bengal, Odisha, Andhra Pradesh, Puducherry, Tamil Nadu, Andaman & Nicobar Islands) and the west coast (Gujarat, Daman & Diu, Karnataka, Goa, Maharashtra, Kerala, Tamil Nadu and Lakshadweep Islands) for 45- 62 days. As monsoon is the most ideal time for spawning, the seasonal fishing ban is timed accordingly, to allow the fish to breed without any interruptions or hindrances. The most important impact of the ban is to prevent overfishing and ensure there is a balance. An added benefit is protection for the fishermen from the choppy seas and unpredictable weather caused by the monsoon.

Many problems plague the fishing industry in India. Illegal, Unreported, and Unregulated (IUU) fishing has exacerbated overfishing. IUU fishing involves activities such as fishing without proper licenses, using banned gear, and disregarding catch limits. The Food and Agriculture Organisation's (FAO) State of World Fisheries and Aquaculture report notes that nearly 90% of the global marine fish stocks have either been fully exploited or over-fished or depleted to an extent that recovery may not be biologically possible. While the nearshore coastal waters are highly overfished, the high-value fish stock proliferates in the deep seas. Insufficient cold storage

losses. The use of formalin to keep the stock fresh has led to a ban on the export of fish catch. Marine capture fishery comprises largely of small fishermen who operate traditional boats — either non-motorised vessels or boats with a basic outboard motor. These vessels cannot operate beyond nearshore waters. Limited access to modern fishing technology, such as fish finders and GPS navigation systems, restricts the ability to locate fish stocks accurately. Rising sea temperatures, ocean acidification, and changing currents have a profound impact on marine ecosystems and fish populations.



Climate change leads to shifts in fish distribution, reduced productivity, and increased disease vulnerability. Pollution, habitat destruction, and coastal development further degrade marine ecosystems. Low incomes, lack of access to credit and insurance, and inadequate social security measures contribute to the vulnerability of fishing communities. According to a report by FAO, fish farmers' average annual production in Norway is 172 tonnes per person, while in Chile it is about 72 tonnes, in China 6 tonnes and in India only 2 tonnes. Indian fishermen sometimes get captured by Sri Lankan and Pakistani navies. They get captured when they inadvertently cross into the territorial waters of that country. Most of the Indian fishermen who get captured by Pakistan are from Gujarat. The capturing happens especially at Sir Creek in the northern part of Gujarat in the Rann of Kutch, where there is a dispute between India and Pakistan regarding the demarcation of the actual maritime boundary. More Indian fishermen get caught than Pakistani ones; that is because there is more fish on the Pakistani side due to the delta of the Indus River. Even the quality of the fish on the other side is good as per the fishermen. The fishermen follow the fish and take a risk with the maritime boundary between the two countries. According to the list exchanged by India and Pakistan on 1 July 2023, there are 266 Indian fishermen in Pakistani jails and 74 Pakistani fishermen in Indian jails. There are no fishermen currently lodged in the Sri Lankan jails.

The fishing sector has many scopes despite the problems faced by the sector. Commercial farming of high-value cold water species like exotic rainbow trout has been taken up successfully and estimable progress has been made. Brackish water bodies have huge potential for both finfish and shellfish culture. Hardly 15% of brackish water areas have been developed for commercial farming in India. Ornamental fisheries are the  $2^{nd}$  most popular hobby with approximately 10 crore hobbyists in the world. However, India's share of global ornamental fish export is negligible (0.53% with an import share of 0.42%), despite the sector has enormous potential to grow due to the conducive environment and high diversity of tropical fishes. The potential states identified for the development of Ornamental Fisheries are West Bengal, Tamil Nadu, Maharashtra, Kerala, Odisha, Gujarat, Karnataka, Assam and Manipur.

Seaweed cultivation is one of the potential areas to be explored which is expected to open new avenues, especially for women in coastal areas, provide a source of income for economically weaker sections of society in rural areas and promote entrepreneurship. With its long coastline and the EEZ, India has enormous scope for seaweed cultivation and the promotion of seaweed-based industries. There are about 844 species of seaweeds reported out of which about 60 species are commercially important ones. The red seaweed is the most cultivated variety of seaweed in India. Karnataka is the largest producer of seaweed in India producing 22,000 tonnes followed by Gujarat, Maharashtra and Lakshadweep.

The river ranching scheme has been taken up as a priority activity to replenish the depleted fish stock in rivers. Expansion of area under Aquaculture has to become an important option to boost fish production. In this context, derelict water bodies are expected to be immensely useful and be an important resource to boost fish production for meeting the future fish demands of the country. Modernization of the fishing harbour is another thrust area mainly to improve hygienic conditions of the harbour facilities to enhance export earnings and also ease congestion.

As vast as the ocean, the Indian fishing sector holds many opportunities for its dependents. The sector is now classified as a sunrise sector by the Government of India. Responsible fishing and the adoption of modern technologies can make fishing, one of the oldest professions known to mankind, a sustainable source of livelihood for millions of people in years to come.



# The Coming of the Europeans to India

pices were always considered the gold of the Indies. In fishermen off with him by force. obtain in Europe, and the caravans brought these and experienced merchants coming from the East. Only the ports of Venice and Genoa in Italy scattered these products across Europe, but at a significant cost, and without guaranteed arrival. With the capture of Constantinople in 1453 by the Ottomans, the trade at Venice and Genoa declined. The advantage of the Portuguese to establish a sea route virtually free of assault showed itself rewarding and outlined a significant income to the Portuguese Crown in the future. Portugal directly linked the spice-producing regions to their markets in Europe.

Fast forward to 1498, the fleet carrying Vasco da Gama arrived at Kappakadayu, near present-day Kozhikode in Kerala, on 20 May 1498. The King of Kozhikode, the Saamudiri (Zamorin in English), returned to Kozhikode (Calicut) on hearing the news of the arrival of foreigners. When asked by the local authorities as to what brought them to Kozhikode, the fleet replied that they came in search of 'Christians and spices'. The presents brought by Gama were trivial and did not impress the Zamorin. Vasco da Gama's request for permission to leave a factor behind him in charge of the merchandise he could not sell was turned down by the King, who insisted that Gama pay customs duty - preferably in gold - like any other trader, but Vasco da Gama was unable to pay the duties. When the duties were not paid, the Zamorin's officials detained some of Vasco da Gama's men. Annoyed by this, Gama carried a few Nairs and sixteen



Vasco da Gama before the Zomorin of Calicut (Velasco Salgoda, 1898)

Europe, the spices imported from the East were mainly Thus began the advent of the Europeans as traders into India used to preserve the meat. Cinnamon, ginger, cloves, black through the sea route called 'The Cape Route' - the Portuguese pepper and turmeric were the products that were difficult to in 1498, the British and the Dutch in 1605, the Danes in 1620, the French in 1667, and the Austrians in 1778. Even though the primary motive at first was trade, slowly, the European powers started to get more interested in acquiring territory.

### Portuguese - 1503 to 1961

Conflict with the Zamorin and the expeditions of Vasco Da Gama established a base of operations on the Malabar Coast with the headquarters in what became the modern-day Kochi. To counter the threat of the Mughals, the Seven Islands on the coast of northern Maharashtra were handed over by the Guirat Sultanate to the Portuguese on Christmas Day in 1535. The Portuguese called the islands by various names, which finally took the written form 'Bombaim', meaning the Good Bay in Portuguese.

The port city of Kochi served as the headquarters of the colonial possession of the Portuguese from 1503 to 1530. With the aid of the Vijayanagara Empire, the Portuguese established a permanent settlement in Goa in 1510. In 1530, the headquarters was moved to Old Goa. In 1843, it was shifted to Panaji, then renamed Nova Goa, when it officially became the administrative seat of Portuguese India for the next 118 years. Portuguese control would only be restricted to Goa and the enclaves of Diu and Daman for the next century. The Portuguese called their possessions in the Indian subcontinent as 'Portuguese State of India' (Estado Português da Índia) from 1505 to 1946 and as 'Overseas province of Portugal' from 1946 to 1961.

While most of India got its independence from the British, the Portuguese still held on to its colonial outposts in India. Despite repeated requests from the Indian government to hand over its colonial holdings, the Portuguese government under Dictator António de Oliveira Salazar refused such a notion claiming they were an integral part of Portuguese territory. Adopting a 'wait and watch' tactic from 1951 to 1961, the Indian government highlighted the issue of decolonisation before the international communities, while at the same time enforcing an economic embargo. It was in December 1961, when the Indian military launched 'Operation Vijay' to liberate Goa. In India, this action is referred to as the 'Liberation of Goa'. In Portugal, it is referred to as the 'Invasion of Goa'. Jawaharlal Nehru had hoped that the popular movement in Goa and the pressure of world public opinion would force the Portuguese Goan authorities to grant it independence but since it did not

have any effect, he decided to take it by force. Against placed under the direct rule of the British Crown. The EIC was overwhelming odds, the Portuguese tried to put up a fight but dissolved in 1874. were swiftly defeated by the Indian Army. The Governor of The Government of India Act 1858 led to the creation of the Portuguese India signed the Instrument of Surrender on 19 rule. India's sovereignty was not recognised by Salazar's government until its fall in the 1970s from which point onwards the relationship between India and Portugal became amicable.

#### British - 1608 to 1947

The East India Company (EIC) was a joint-stock company founded in 1600 under a charter granted by Queen Elizabeth. It was formed to trade in the Indian Ocean region, initially with East Indies, and later with East Asia. The British merchants and aristocrats held shares in this company. However, the British Crown and the Government had no controlling authority over the company and they shared no direct links. At its peak, the EIC was the largest corporation in the world having its own armed forces, the size of which was twice the size of the British army. They landed at the Surat port on 24 August 1608 to trade in spices, silk, cotton opium, tea, indigo dye, salt, sugar, and saltpetre.

Having obtained permission for the Mughal Emperor Jehangir, they began trading and established factories across the Mughal empire. Soon they received permission to establish factories in other parts of India. Several trading posts were established all over the east and west coasts of India and British communities developed in the three major trading towns of Kolkata, Chennai and Mumbai. The city of Kolkata was founded in 1698 when the British acquired the zamindari of three villages Suttanati, Kalikata, and Govindpur. Gradually, the EIC, later known as the British East India Company, started to transform from a trading company to a ruling one. Their fortunes kept increasing until the First War of Indian Independence in 1857, after which the Indian subcontinent was



Robert Clive meeting Mir Jafar after the Battle of Plassey (Francis Hayman, 1762)

British Raj which ruled India for 89 years till the midnight of 15 December 1961, liberating Goa after 450 years of Portuguese August 1947. The British Raj never encompassed the entire land mass of the Indian subcontinent. Two-fifths of the Indian subcontinent continued to be independently governed by over 560 large and small principalities, some of whose rulers had fought the British during the Sepoy Mutiny in 1857, but with whom the Raj now entered into treaties of cooperation.

> The pressure from the rising tide of nationalism made running the British empire politically and economically very challenging and increasingly not cost-effective. European capital investment declined in the inter-war years and India went from a debtor country in World War One to a creditor in World War Two. Britain's strategy of a gradual devolution of power, its representation to Indians through successive constitutional acts and a deliberate 'Indianisation' of the administration, gathered a momentum of its own. As a result, India moved inexorably towards self-government. The actual timing of Independence owed a great deal to World War Two and the demands it put on the British government and people. Furthermore, with US foreign policy pressurising the end of Western subjugation and imperialism, it seemed only a matter of time before India gained its freedom. The arrival of Lord Louis Mountbatten as India's last vicerov in March 1947. brought with it an agenda to transfer power as quickly and efficiently as possible. The resulting negotiations saw the deadline for British withdrawal brought forward from June 1948 to August 1947.

### Dutch - 1605 to 1825

Although the Dutch established colonies in India, it was more of a geographical location than a political possession. The Dutch in India had no political authority. The Dutch had the shortest presence out of all European colonial powers that came to India. The Dutch East India Company (Vereenigde Oost Indische Compagnie) was looking to trade spices in exchange for textiles. The first factory founded in the Dutch Colonies in India was situated at Machilipatnam in 1605 in present-day Andhra Pradesh, and after 5 years, the Dutch established their second factory at Pazhaverkadu (Pulicat) in present-day Tamil Nadu. The capital of the Dutch Colonies in India was Pazhaverkadu. As trade increased, the Dutch Colonies in India established a series of factories in various parts of the country.

The history of the Dutch Colonies in India began to face an end during the 18th century when British rivals started to pursue aggressive colonial endeavours in India. The Battle of Colachel in 1741 against the King of Travancore, Anizham Thirunal Martanda Varma, was the last nail in the coffin of the Dutch



battle and managed to bring the Dutch domination of India to an end. By the middle of 1825, the Dutch lost all their remaining posts to the British, and the Dutch withdrew from India.

### Danes - 1620 to 1868

Danish India (Dansk Ostindien) was the name given to the Danish colonies in the Indian subcontinent, forming part of the Danish Overseas Colonies. Their important settlements in India were at Tharamgambadi (Traguebar) in Tamil Nadu, Serampur in West Bengal and the Nicobar Islands. The Danish presence in India was of little significance to the major European powers as they presented neither a military nor a mercantile threat. Dano-Norwegian ventures in India, as elsewhere, were typically undercapitalised and never able to dominate or monopolise trade routes in the same way that British, French, and Portuguese ventures could. Despite these disadvantages, the Danish-Norway concerns managed to cling to their colonial holdings and, at times, to carve out a valuable niche in international trade by taking advantage of wars between larger countries and offering foreign trade under a neutral flag.

In 1620, when the Danish trading station was established by the Danish East India Trade Company, Tranguebar was already a well-functioning Indian town with some commercial activities, a large population of fishers, and a fertile agricultural hinterland. The Danish trading station in Tharamgambadi never generated much profit and after 1800, it gradually lost importance as a centre of trade due to tough competition from the rapid expansion of British power. In the 1820s, European merchants and local Indian weavers moved out of Tranquebar and left the fortified town depopulated, dilapidated, and impoverished. In 1845, Tranguebar was sold for a minor sum to the British, along with Serampore. In 1868, the Danes sold their possessions in Nicobar to the British and returned home to their country.

#### French – 1667 to 1954

French Colonies in India were by far the smallest of the European possessions in terms of area. French were the last Europeans to arrive in India. During the reign of Louis XIV, the king's famous minister Colbert laid the foundation of the French East India Company (Compagnie des Indes Orientales) in 1664, in which the king also took a deep interest. The first French expedition to India reached Surat in 1667. In 1673, the township at Chandernagore near present-day Kolkata was established. In the next year, the French acquired the area of Puducherry from the Sultan of Bijapur, thus establishing the Puducherry colony.

Colonies in India. Martanda Varma conquered the Dutch in the Until 1741, the French were mainly interested in commercial ventures peacefully acquiring territories such as Yanam, Mahe and Karaikal. By 1769 the French Crown realised it was too expensive in letting the French East India Company continue its operation, effectively abolishing it in that year. The French Crown assumed administration of the French possessions in India thereafter. By the time of Napoleon Bonaparte's defeat in 1816, the French had the following establishments still in their possession - Puducherry, Mahe, Karaikal, Yanam, Chandernagore and the lodges at Machilipatnam, Kozhikode and Surat.

> With the Independence of India in 1947, France eventually decided to relinguish their territories in India. The lodges in Machilipatnam, Kozhikode and Surat were added to India in October 1947. Chandernagore was relinguished to India on 2 May 1950. It became a part of West Bengal on 2 October 1954. On 1 November of that same year, Puducherry, Yanam, Mahe and Karaikal were given over to the Indian Union. Ultimately the French and Indian governments finally ratified a treaty in 1962 which confirmed the transfer of territorial possessions to the Union of India.

### Austrians – 1778 to 1783

The Austrians had briefly colonized the Nicobar Islands in 1778. The attempt was short-lived and unsuccessful. Nicobar had previously been a Danish colony and Austria established it with the mistaken assumption that Denmark had abandoned its claims to the islands. However, by 1783 due to lack of support, the last colonists left. The start was made in the 1760s to set up trading posts in Asia for the distribution of Austrian products. It was more a whim than a serious project since the largely land-based Austrian empire did not have adequate sea power to acquire, defend and supply remote possessions.

What started as a secret project with a falsely British-flagged ship very soon collapsed. However, in 1778, after surmounting enormous difficulties, the Austrian vessel 'Joseph and Maria' finally reached the Nicobar Islands which had only recently been abandoned by the Danes. The Danes had given up there after losing most of their people to malaria. On 12 July 1778 the natives signed a document that ceded the four islands of Nancowry, Kamorta, Trinket and Katchal to Austria. The Austrian flag was run up on a nearby hill and six men besides cattle, arms and slaves were left behind to start the new Austrian colony. In 1781 the colonists complained about a lack of drinking water and food but Vienna took no notice and left its outpost to its fate. When the leader of the colonisation died in 1783, the attempt at starting an Austrian colony died with him.

ccording to a Harvard Business Review, a lot of younger executives in age 28 to 35 years and working in impact companies struggle with two apparently unrelated problems - disengaged younger workers and a weak response to changing market conditions. A few companies have tackled both problems at the same time by creating a 'shadow board' - a group of non-executive employees that works with senior executives on strategic initiatives.

A shadow board is designed to introduce a company's leadership team to new perspectives and insights, thereby helping to drive strategy. The shadow board might contribute

levels 4, 5 and 6. MCF YCB is used to test and pilot novel initiatives that are important to younger employees, bridge generational gaps between younger employees & Senior Executives and create respect and understanding across the organizational hierarchy.

After a rigorous selection process involving group discussions, case study analysis and interviews, the CEO, Mr Nitin Kantak, announced the names of five young and promising employees to the first edition of the prestigious MCF YCB on 31 May 2023.



Abhishek



**Krishnaraja** 



13





Nadeem

Sharan

to initiatives as significant as developing a new marketing plan, redesigning a business model, or updating key processes in the organization's value chain. It can also shift corporate culture in two ways - Board members can gain access to new perspectives and younger employees can experience the inner workings of a board and share what they learn with their peers.

The CEO usually sponsors the shadow board. The younger, less-experienced employees learn the complexities of the business, see how leaders make decisions, and get advice on their goals. The senior executives get new information and insights from different parts of the company and form personal relationships with up-and-comers in the pipeline. When done correctly, with the right planning and goals from the top, shadow boards can put management's finger on the pulse of the organization while also keeping its eyes on the future. Some of the big corporates like Accor, Gucci, Beazeley Group, Mahindra and many others have shadow boards.

MCF has developed its own version of the shadow board called the MCF Youth Council Board (MCF YCB). The MCF YCB is a first of its kind in Adventz Agri-Business. MCF YCB is a group of

They are - Mohammed Nadeem Shaikh, Chief Manager (Electrical), Rajeev R, Chief Manager (Production), Krishnaraja Bhat V, Manager (Maintenance), Sharan U P, Manager (Maintenance) and Abhishek Rao K S, Deputy Manager (Procurement). These professionals will balance their responsibilities between their regular work in the current role and as a member of MCF YCB for a period of two years starting from June 2023.

MCF YCB is sponsored by the CEO. To help balance their responsibilities, the YCB members are guided by mentors drawn from the higher echelon of the company. Each YCB member will be guided by the mentor for a period of three months after which the member will be guided by another mentor in rotation.

Strategic corporate enterprises like MCFYCB demonstrate the farsightedness of the organization in developing a passionate next-gen to drive the company into the future and also to show the younger generation that they are valued.

Mangala Vartha congratulates the YCB members on their selection and wishes them success and a bright career ahead.

# Jnana Jyothi Aksharada arivu, mahileya geluvu

Women's education is critical to social development and progress in any society. Educating women has numerous positive impacts on individuals, families, and entire communities. Education empowers women by providing them with knowledge, skills, and confidence to make informed decisions and participate actively in various spheres of life, including social, economic, and political. Education is essential in promoting gender equality. When women and girls have access to education, they are more likely to challenge traditional gender roles and discriminatory practices, leading to more equitable societies. Educated women tend to have better health outcomes for themselves and their families. They are more likely to seek medical care, adopt healthier behaviours, and make informed decisions. Educated women are more likely to enter the workforce, contribute to the economy, and increase household income, leading to economic growth. When educated, women are better equipped to escape poverty, and educated mothers tend to practice at home and also at work to read and write, and invest more in their children's education and health. most importantly, their punctuality in attending the daily Education challenges stereotypes and traditional gender class speaks volumes about their dedication and passion norms, helping to break down barriers that limit women's for educating themselves. The valedictory ceremony was opportunities and potential.

gardeners at M(F have benefited and achieved much appreciation and a certificate for completing the of the positive impact of basic education as described program successfully. A befitting memento was also above. Jnana Jyothi has become successful in making given to the teachers of Jnana Jyothi for their selfless women literate & they can now read and write in Kannada and also perform basic arithmetic operations on their own.

Jnana Jyothi began on 9 March 2023 with 30 participants and concluded on 28 July 2023. The have been deprived of basic education. In the words of program, an initiative of Mangala Oartha, was Brigham Young, a 19th-century American religious launched on 8 March 2023 on International Women's leader and politician & You educate a man; you educate a Day. The interest shown by the women during the classes, their attempt to learn to read and write, their

Be self-reliant, be industrious Work, gather wisdom and riches, All gets lost without knowledge We become animal without wisdom, Sit idle no more, go, get education End misery of the oppressed and forsaken, You've got a golden chance to learn So learn and break the chains of caste. Throw away the Brahman's scriptures fast.

> Savitribai Phule Jan 3, 1831 - March 10, 1897

held on 22 August 2023, in which our CEO, Nitin Mangala Oartha believes that through its unique Kantak, recognized the effort put in by the women by initiative Inana Jyothi, the women janitors and presenting them with a souvenir as a token of effort.

> However, the buck does not stop there. The purpose of Jnana Jyothi will be fully realised when these educated women, in turn, educate their family and friends who man. You educate a woman; you educate a generation'.





Jnana Jyothi classes in progress



Jnana Jyothi beneficiaries receiving the certificate and souvenir







Jnana Jyothi teachers receiving the memento



# 77<sup>th</sup> Independence Day Celebrations

"Long years ago we made a tryst with destiny, and now the time comes when we shall redeem our pledge, not wholly or in full measure, but very substantially. At the stroke of the midnight hour, when the world sleeps, India will awake to life and freedom. A moment comes, which comes but rarely in history, when we step out from the old to new, when an age ends, and when the soul of a nation, long suppressed, finds utterance... The ambition of the greatest man of our generation has been to wipe every tear from every eye. That may be beyond us, but so long as there are tears and suffering, so long our work will not be over. And so we have to labour and to work, and work hard, to give reality to our dreams. Those dreams are for India, but they are also for the world."

An excerpt from Jawaharlal Nehru's Tryst of Destiny speech, August 15, 1947

n 1947, India woke up to a new dawn. We not only won freedom from foreign rule but also the freedom to rewrite our destiny. On 15th August 2023, India celebrated its 77th Independence Day. The theme of this year's celebration is 'Nation First, Always First' as a part of the 'Azadi Ka Amrith Mahotsav' celebrations. The Azadi Ka Amrith Mahotsav which was launched by the Prime Minister from Sabarmati Ashram in Ahmedabad on 12 March 2021 culminated on 15 August 2023.

On the eve of Independence Day, the President delivers the 'Address to the Nation'. On Independence Day, the Prime Minister hoists the Tiranga on the ramparts of the Red Fort in Delhi. After hoisting the National Flag, the Prime Minster addresses the nation. This is followed by a march-past by a division of the Indian Armed Forces and Paramilitary Forces. Similar events take place in state capitals where the Chief Ministers of individual states unfurl the national flag, followed by parades and pageants. Until 1973, the Governor of the State hoisted the National Flag at the State capital. In February 1974, the Chief Minister of Tamil Nadu, M. Karunanidhi took up the issue with then Prime Minister Indira Gandhi that the Chief Ministers, like the Prime Minister, should be allowed to hoist the National Flag on Independence Day. Since 1974, Chief Ministers of the respective states have been hoisting the National Flag on Independence Day at the respective state capital.

At MCF Works, S Girish, CMO, hoisted the Tiranga in front of the administration building followed by the inspection of the Guard of Honour. The CMO in his speech highlighted the essence of freedom and the endeavour of all of us to maintain the dignity of the invaluable freedom that was won by our forefathers and passed down to the generations in the past 76 years.

During the occasion, the Adventz Excellence cash award was presented to two Mangala Family members for achieving excellence in sports and games, and scholarships for academic excellence to five students in 10th standard and 2nd PUC. Congratulations Chetan, Spoorthi, Shreevardhan, Eshan, and Dristhi for securing the scholarship awards, and Alyssa, Alaister for securing the excellence awards in sports and games. Mangala Vartha wishes you a bright future and success in your future endeavours.

In recognition of the long service, the Service Award was given to 35 recipients who had completed 10 years of service at MCF during the celebrations at Works. Congratulations Ranjith, Vinaya, Nitheen, Yashavantha, Sachin, Preetham, Naveen, Basavaraj, Chidan, Bharath, Ashwin, Niranjana, Sampath, Ganesha, Nithesh, Charan, Lavin, Benedict Joachim, Rahul, Deepak, Harshith, Ashoka, Nithin, Sangam, Nitesh, Kumar, Deepak, Rajeev, Shashanka, Keerthi, Ashwath, Roshan Lal, Abhishek, Chethan, and Deekshith. Mangala Vartha appreciates your valuable service to our company.

Mangala Vartha also appreciates the dedicated service put in by T M Muralidharan, Satheesh, Sanmathi, Parani Veeran, and Sathisha who have been bestowed the Service Award. Congratulations to you too.































# To boldly go where no man has gone before...

These words were said by the fictional character Captain James T. Kirk (William Shatner) in the title sequence of the 1966 – 1969 Star Trek series. And now, it defines exactly what India achieved at 6:02 PM on 23 August 2023, the day ISRO's Chandrayaan 3 made a soft landing on the south pole of the Moon. Chandrayaan 3 made India the first country to successfully land a spacecraft on the southern pole of the Moon, and the fourth country after the USSR, the USA and China to ever land on the lunar surface.

Situated at a mean distance of 3,84,400 km from the Earth, the Moon is the brightest object in the sky after the Sun as seen from Earth. In addition to its nearness to Earth, the Moon is relatively massive compared with it. The ratio of their masses is much larger than those of other natural satellites to the planet they orbit. The hemisphere of the Moon that we see from the Earth is called the near-side. The far-side of the Moon is the hemisphere that faces away from the Earth; in other words, it is the surface of the Moon that we can't see from the Earth. The Moon's proximity makes it a great testbed for technologies required for deep space exploration, including putting humans on Mars. Lunar exploration can also help assess the Moon's potential for resources and human habitation.

### Lunar Missions

The USSR's launch of Sputnik 1 ushered in the Space Age and kicked-off the Space Race. Following Sputnik in 1957, it became obvious that the next major goal of both the USSR and the US space programs would be the Moon. The US quickly prepared and launched a few robotic lunar probes, most of which failed and none of them reached the Moon. The USSR had more success, achieving in 1959 the first escape from Earth's gravity with Luna 1, the first impact on the lunar surface with Luna 2, and the first photographic survey of the Moon's far-side with Luna 3. In response to early Soviet space achievements, the US administration built the NASA in October 1958 to oversee space exploration and aeronautics research.

After the Soviet cosmonaut Yury Gagarin pioneered human Earth-orbital flight in April 1961, the US President John F. Kennedy established the national objective of landing a man on the Moon and returning him safely by the end of the decade. Apollo was the result of that effort. Within a few years, the USSR and the US were heavily engaged in a political and technological race to launch manned flights to the Moon. At the same time, the USSR did not publicly acknowledge the full extent of their program, but they did launch several human pre-cursor circumlunar missions between 1968 and 1970 under the generic name Zond. Some of the Zond flights brought back colour photographs of the Moon's far-side and safely carried live tortoises and other organisms around the Moon and back to Earth.

Starting from the 1950s, 146 missions (including failed missions) have been made to the Moon so far. The USA made the maximum number of missions to the Moon – 59, closely followed by the USSR with 58 missions. The Cold War 1960s decade saw 63 missions to the Moon. Though there have been 146 missions, soft landing on the lunar surface was attempted by very few missions. A soft landing is a kind of landing that does not result in significant damage to the vehicle or its payload. The average vertical speed in a soft landing is 2m/s or less.

The first spacecraft to land on the Moon successfully was Luna 2 of the USSR on 13 September 1959. This was followed by Luna 9 which made the first soft landing on the Moon on 3 February 1966. However, it was Apollo 11 that made, perhaps, the biggest headline of all the lunar missions on 29 July 1969, when it became the first manned mission to the Moon. While Apollo 11 sparked the interest of the whole world, subsequent Apollo missions did not hold sway as much was done by Apollo 11. Thus, Apollo 17 was the last manned mission to the Moon in December 1972. Apollo 17 was followed by the Luna 24 mission that landed on the Moon on 22 August 1976 and it went on to become the last mission to the Moon by the USSR. After a long Iull of 37 years, the next soft landing on the Moon was done by China's Chang'e 3 on 14 December 2013. This was the first successful mission by China to soft land on the Moon. Chang'e 4 became the first spacecraft to soft land on the far-side of the Moon on 3 January 2019.

Luna 25 of Russia's Roscosmos made a failed soft landing on the south pole of the Moon on 20 August 2023, just days before Chandrayaan 3, after a failed orbital maneuver. Luna 25 was the first lunar mission of Russia after the disintegration of the USSR, and would have been the first lander to land on the lunar south pole.

Attempting a soft landing on the south pole of the Moon is much more difficult when compared to the landing on the lunar equator. On the mountainous southern pole, the terrain is difficult and dangerous with many craters and trenches; these regions are in perpetual darkness due to poor sunlight. The temperatures in the southern pole can drop to as low as minus  $150^{\circ}$ C. In the early 1960's scientists had speculated about the existence of water on the Moon. But the lunar samples returned by the Apollo missions appeared dry. In 2009, a NASA instrument on Chandrayaan 1 discovered water on the surface of the Moon at its south pole.

Nations around the world are keen to reach the southern pole of the Moon due to the presence of lunar water ice, potentially the most valuable resource of the Moon. Water ice could be a valuable resource for future Moon exploration, as it could be used as a source of drinking water, to cool equipment, or to produce fuel and breathable oxygen. Space agencies and private companies see it as a key to a Moon colony, lunar mining and potential missions to Mars. A business case analysis indicates that mining of propellants in the craters could become a profitable commercial enterprise.

#### **Chandrayaan Mission**

ISRO was formed on 5 August 1969; in the early days of ISRO, rocket parts were often transported on bicycles and bullock carts to the launch sites. Prime Minister Atal Bihari Vajpayee announced the Chandrayaan project in his Independence Day speech on 15 August 2003. The Chandrayaan program, launched in 2008, is a series of outer space missions by ISRO for the exploration of the Moon. The program consists of a lunar orbiter, an impactor, a soft lander and a rover spacecraft. The first launch was Chandrayaan 1 which hard landed on the lunar surface on 14 November 2008. The impact probe released from the Chandrayaan orbiter hit near the Shackleton crater on the surface. The location of the impact was named Jawahar Point or Jawahar Sthal as the day of impact was the birthday of Jawaharlal Nehru. The mission was a success and it ended after 310 days.

Chandrayaan 2 was launched in September 2019 and failed due to a software glitch when attempting a soft-land on the southern pole. Chandrayaan 2's lander failed to reduce its speed to the desired level in the final seconds of descent, resulting in a crash landing. This mission cost Rs.978 crore and it was even cheaper than the 2014 Hollywood film 'Intersteller' (Rs.1,062 crore). The landing site of Chandrayaan 2 was named as Tiranga.

Chandrayaan 3 is a cost-effective mission costing around Rs.615 crore. Out of the Rs.615 crore, the lander, rover and propulsion module costs Rs.250 crore and the launch services cost around Rs.365 crore. The objectives of the mission are 1) to demonstrate a safe and soft landing on the lunar surface, which is the primary objective of the mission; 2) to demonstrate rover roving on the Moon; and 3) to conduct in-situ scientific experiments to better understand the composition of the Moon. Chandrayaan 3 has a lander named 'Vikram' and a rover named 'Pragyan', but it does not have an orbiter. The lander and rover have a combined mass of 3,900 kilograms. Chandrayaan 3 was launched aboard a Geosynchronous Satellite Launch Vehicle Mark III rocket, which is India's most powerful rocket to date, from Satish Dhawan Space Centre in Sriharikota, Andhra Pradesh on 14 July 2023 at 14:35:17 IST. Compared to Chandrayaan 3, Luna 25 lifted up on 10 August 2023, and entered the lunar orbit on 16 August 2023. The landing site of Chandrayaan 3 was named as Shiv Shakthi by the Prime Minister on 26 August 2023.

After the successful landing, the Vikram lander deployed the rover Pragyaan on 25 August 2023 to explore the lunar surface and perform experiments using the on-board instruments. One of the significant observations made by ChaSTE (Chandra's Surface Thermophysical Experiment) was the wide

#### Lunar expeditions and landings

in August 23, 2023 India successfully touched down on the lunar South Pole. The Soviet Union, the inited States, China and India are the only four countries that have successfully carried out soft andings on the moon.

#### USA 🕒 USSR 😔 China 🔍 India



variation in the temperature just above and below the surface of the Moon. The range of temperature was -10°C to 60°C over a depth of 80mm below the surface to 20mm above the surface. These measurements were consistent with what is known about the thermal profile of the Moon from previous expeditions and experiments. But this was the first direct measurement of temperatures of the topsoil and the subsoil near the south pole. Another tremendous observation was the detection of Sulphur in the lunar surface. The presence of Sulphur on the Moon has been known before; however, it was detected for the first time at the south pole by the rover. After completing the assignments, Pragyaan was put into sleep-mode by ISRO on 2 September 2023 to enable the lunar module to withstand the lunar night. During the lunar night, the south pole does not receive sunlight.

Going forward, ISRO has planned a joint lunar mission with Japan Aerospace Exploration Agency (JAXA) known as the Lunar Polar Exploration Mission (LUPEX) or Chandrayaan 4 in 2026.

Chandrayaan 3 marks an important epoch in the history of India. It is also a significant milestone in India's space program that demonstrates the capability of India to build complex technology indigenously and in a very cost-effective manner. Chandrayaan 3 is indeed a great achievement that makes every Indian beam with pride!!!



# ಕಳೆದು ಹೋದವಳು

ಈ ಕಥೆಯನ್ನು ಮಂಜು ನನಗೆ ಹೇಳಿದಾಗ ನಾನು ನಿಜಕ್ಕೂ ನಂಬಿರಲಿಲ್ಲ. ಇದು ಅವನ ಭ್ರಮೆ ಮತ್ತು ಕಲ್ಪನೆಯನ್ನು ಒಟ್ಟುಗೂಡಿಸಿ ಹುಟ್ಟಿಕೊಂಡ ಕಥೆ ಎಂದುಕೊಂಡಿದ್ದೆ. ಈಗ ಅದು ನಿಜವಿದ್ದರೂ ಇರಬಹುದೆನಿಸುತ್ತದೆ.

ಮಂಜ ಹುಟ್ಟಿ ಬೆಳೆದದ್ದು ನಮ್ಮ ಊರಿನಲ್ಲೆ. ನಮ್ಮ ಊರು ಮಲೆನಾಡಿನ ಒಂದು ಹಳ್ಳಿ. ಮಲೆನಾಡಿನಲ್ಲಿ ಬೇಟೆ ಮೊದಲಿನಿಂದಲೂ ನಡೆದು ಬಂದಿದೆ. ತುಂಬಾ ಹಿಂದೆ ಜನರು ಬೇಟೆಯನ್ನು ಭರ್ಜಿ, ಬಲೆ, ಈಟಿಗಳನ್ನು ಉಪಯೋಗಿಸಿ ಮಾಡುತ್ತಿದ್ದರು. ನಂತರ ಸುಡುಮದ್ದು, ಕೋವಿಗಳು ಬಂದವು. ಬೇರೆ ಆಯುಧಗಳಿಂದ ಕೊಲ್ಲಲು ಹೆಚ್ಚುಕಡಿಮೆ ಕಷ್ಟಸಾಧ್ಯವೇ ಆಗಿದ್ದ ಪ್ರಾಣಿಗಳು ಕೋವಿ, ಸುಡುಮದ್ದಿನ ಮುಂದೆ ಅಷ್ಟೇ ಅಸಹಾಯಕವಾಗಿ ಹೋದವು.

ಮಂಜನ ಮನೆಯಲ್ಲಿ ಒಂದು ಹಳೆಯ ಕಾಲದ ಕೋವಿ ಇತ್ತು. ಅವರಪ್ಪ ಮುದುಕನಾದ ನಂತರ ಅವನ ಆಸ್ತಿಯ ಒಂದು ಭಾಗವಾಗಿದ್ದ ಕೋವಿಗೆ ಇವನೇ ಒಡೆಯನಾದನು. ಕೋವಿ ಕೈಯಲ್ಲಿ ಹಿಡಿದವರಿಗೆ ಸರಸ್ವತಿ ಒಲಿಯುವುದಿಲ್ಲ ಎನ್ನುವ ಮಾತು ನಮ್ಮಲ್ಲಿ ಪ್ರಚಲಿತದಲ್ಲಿದೆ. ಕೋವಿ ಕೈಗೆ ಸಿಕ್ತ ನಂತರ ಶಾಲೆಗೆ ಬೆನ್ನು ತಿರುಗಿಸಿ ಆ ಮಾತನ್ನು ಮಂಜ ಸತ್ಯವಾಗಿಸಿದನು. ಆ ಕೋವಿಗೆ ಪರವಾನಗಿ ಇತ್ತು. ಬ್ರಿಟೀಷರ ಕಾಲದಲ್ಲಿ ಬೆಳೆಯನ್ನು ಕಾಡುಪ್ರಾಣಿಗಳಿಂದ ರಕ್ಷಿಸಲು ಪರವಾನಗಿ ನೀಡುತ್ತಿದ್ದರಂತೆ. ಪರವಾನಿಗೆಯನ್ನು ಪಡೆದದ್ದಷ್ಟೆ, ನವೀಕರಿಸುವ ಕಡೆ ಗಮನ ಕೊಡದಿದ್ದುದರಿಂದ, ಆ ಕೋವಿಗೆ ಪರವಾನಗಿ ಅವಧಿ ಮುಗಿದು ಪರವಾನಗಿ ಪಡೆದವನು ಸತ್ತಷ್ಟೆ ವರ್ಷಗಳಾಗಿತ್ತು. ಕೋವಿಗೆ ಒಡೆಯನಾದ ಹೊಸತರಲ್ಲಿ ಹಗಲೂ ರಾತ್ರಿ ಎರಡೂ ಹೊತ್ತು ಬೇಟೆಗೆ ಹೋಗುತ್ತಿದ್ದವನು ಈಗ ಪ್ರಾಣಿಗಳು ವಿರಳವಾದ್ದರಿಂದ ಹಗಲು ಬೇಟೆ ಕಾಲು ಕೈ ನೋಯಿಸಿಕೊಳ್ಳುವ ವ್ಯರ್ಥ ಕೆಲಸವೆಂದು ಹಗಲು ಬೇಟೆಗೆ ಹೋಗುವುದನ್ನು ನಿಲ್ಲಿಸಿದ್ದನು. ರಾತ್ರಿ ಬೇಟೆಗೂ ಪ್ರತೀರಾತ್ರಿ ಹೋಗುವುದನ್ನು ನಿಲ್ಲಿಸಿ ವಾರಕ್ಕೆರಡು ಸಾರಿ ಹೋಗುತ್ತಿದ್ದನು.

ರಾತ್ರಿ ಬೇಟೆಗೆ ಹೋಗುವವರು, ಹಳೆಯ ಮಾದರಿಯ ನಾಲ್ಕು ಶೆಲ್ನ ಬ್ಯಾಟರಿಯ ತಲೆಯನ್ನು ಮಾತ್ರ ತೆಗೆದು ಉಳಿದ ಭಾಗವನ್ನು ಜಜ್ಜಿ ಒಂದು ಪಟ್ಟಿಯ ತರಹ ಮಾಡಿಕೊಳ್ಳುತ್ತಾರೆ. ಆ ಪಟ್ಟಿ ಸರಿಯಾಗಿ ಹಣೆಯ ಮೇಲೆ ಕೂರುವ ಹಾಗೆ ಅರ್ದಚಂದ್ರಾಕೃತಿಯಲ್ಲಿ ಬಗ್ಗಿಸಿ, ಎರಡೂ ಹಗ್ಗವನ್ನು ಪಟ್ಟಿಗೆ ಸೇರಿಸಿ ನಂತರ, ಬ್ಯಾಟರಿಯ ತಲೆ ಹಣೆಯ ಮೇಲೆ ಬರುವ ಹಾಗೆ, ಪಟ್ಟಿಯನ್ನು ಹಣೆಯ ಮೇಲಿಟ್ಟು ಮೊದಲೇ ಕಟ್ಟಿದ ಹಗ್ಗವನ್ನು ತಲೆಯ ಹಿಂಭಾಗದಲ್ಲಿ ಗಂಟು ಹಾಕಿಕೊಳ್ಳುತ್ತಾರೆ. ಹಣೆಯ ಮೇಲಿಟ್ಟ ಬ್ಯಾಟರಿ ತಲೆಯಿಂದ ಎರಡು ವೈರ್ಗಳನ್ನು ಭುಜದ ಹಿಂಭಾಗದಿಂದ ಕೆಳಗಿಳಿಸಿ ಸ್ವಿಚ್ ನ ಮುಖಾಂತರ ಮೊದಲೆ ತಯಾರಿಸಿರುವ ಒಂದು ಕೃತಕ ಮರದ ಬ್ಯಾಟರಿಗೆ ಜೋಡಿಸಿರುತ್ತಾರೆ. ಮರದ ಬ್ಯಾಟರಿ ಭುಜಕ್ಕೆ ನೆಲಾಡಿಸಿರುತ್ತಾರೆ. ಸ್ವಿಚ್ ಹೊಮ್ಮುತ್ತದೆ. ಬ್ಯಾಟರಿಯನ್ನು ಕೈಯಲ್ಲಿ ಹಿಡಿದು ನಡೆದಾಡುವ ರಗಳೆ ಕಾಡುಬೆಕ್ಕೂ ಆ ಮರಕ್ಕೆ ಬರಲಿಲ್ಲ. ಆದರೂ ದಿನಾ ರಾತ್ರಿ ಹೋಗಿ ಆ ಮರಕ್ಕೆ

ತಪ್ಪುತ್ತದೆ. ಕೋವಿಯನ್ನು ಉಪಯೋಗಿಸುವ ಸಂದರ್ಭ ಬಂದಾಗ ಬ್ಯಾಟರಿ ಕೈಯಲ್ಲಿದ್ದರೆ ಆಗುವ ಅನಾನುಕೂಲವನ್ನು ಇದು ತಪ್ಪಿಸುತ್ತದೆ. ಇದಕ್ಕೆ ರಾತ್ರಿ ಬೇಟೆಗೆ ಹೋಗುವುದನ್ನು ಹೆಡ್ಲೈಟ್ಗೆ ಹೋಗುವುದೆಂದೇ ಕರೆಯುತ್ತಾರೆ.

ಅವನ ಮನೆಯಿಂದ ಸ್ವಲ್ಪ ದೂರದಲ್ಲಿದ್ದ ಗದ್ದೆಯನ್ನು ಹಾದು, ಅದರ ಮುಂದಿದ್ದ ಬೇಣವನ್ನು (ಬಯಲು) ದಾಟಿ, ಅದರಾಚೆಗಿದ್ದ ಬೆಟ್ಟವನ್ನು ಹೊಕ್ಕರೆ ಸ್ವಲ್ಪ ದೂರದ ನಂತರ ಅದೇ ದಟ್ಟ ಕಾಡಾಗಿ ಮಾರ್ಪಟ್ಟಿತ್ತು. ಆ ಕಾಡು ಹಾಗೆ ಇವರ ಊರನ್ನು ಸುತ್ತುವರಿದು, ಇವರ ಊರಿನ ಹಿಂಬದಿಯಿದ್ದ ಗುಡ್ಡದ ತಪ್ಪಲಿನ ತನಕ ಬಂದು ನಂತರ ಬೆಟ್ಟವಾಗಿ ಅದರ ನಂತರ ಬಯಲಾಗಿ ಊರಿನ ಮನೆಗಳ ಹಿಂದೆ ಪ್ರರ್ಯಾವಸನವಾಗಿತ್ತು. ಮೇಲೆ ಹೇಳಿದ ದಾರಿಯಲ್ಲಿ ನಡೆದು ಊರಿನ ಹಿಂಬದಿಗೆ ತಲುಪಲು ಸರಿಸುಮಾರು ಮೂರ್ನಾಲ್ಕು ತಾಸುಗಳೇ ಬೇಕಾಗಬಹುದು. ಹೀಗೆ ಹೊರಟವನಿಗೆ ಭತ್ತದ ಗದ್ದೆಗೆ ಲೂಟಿಮಾಡಲು ಬರುತ್ತಿದ್ದ ಹಂದಿಗಳು ಎದುರಾದರೆ ಮರುದಿವಸ ಹಬ್ಬ, ಇಲ್ಲದಿದ್ದೇನು ಪರವಾಗಿಲ್ಲ ಮುಂದೆ ಬಯಲಿನಲ್ಲಿ ಮೊಲವೋ, ಬರ್ಕಾನೋ ಸಿಗಬಹುದು. ಅಲ್ಲಿಯೂ ಏನೂ ಸಿಗಲಿಲ್ಲವೆಂದರೆ ಮುಂದೆ ಕಾಡಲ್ಲಿ, ಕಬ್ಬೆಕ್ಕೊ, ಮಿಗವೋ ಕಾನುಕುರಿಯೋ ಸಿಗಬಹುದು. ಅಲ್ಲಿಯೂ ಏನೂ ಇಲ್ಲವೆಂದರೆ ಬೇಜಾರಿಲ್ಲ. ಕಾಡಿನಲ್ಲಿ ಆ ರಾತ್ರಿ ಒಬ್ಬಂಟಿಯಾಗಿ ನಿರ್ಭಯುವಾಗಿ ಕೋವಿ ಹಿಡಿದು, ತಣ್ಣನೆಯ ಗಾಳಿಯನ್ನು ಒಳಗೆಳೆದುಕೊಳ್ಳುತ್ತಾ ಕತ್ತಲನ್ನೇ ಅಪ್ಪಿ ನಿಂತ ಬೃಹನ್ಮರಗಳ ನಡುವೆ ಕಾಡಿನ ತಂಪನ್ನು ಸವಿಯುತ್ತಾ, ಅಲ್ಲಿ ಪ್ರಾಣಿಗಳು ಕಾಣಬಹುದು. ಇಲ್ಲ ಪ್ರಾಣಿಗಳು ಕಾಣಬಹುದೆಂಬ ನಿರೀಕ್ಷೆಯಲ್ಲಿ ಅಲೆದಾಡಿದ ಅಲೆಮಾರಿ ಆನಂದವಾದರು ಸಿಗುತ್ತದೆ. ಈ ಸ್ವೇಚ್ಛೆಯ ಆನಂದಕ್ಕಾಗಿ ಶಿಕಾರಿಗೆ ಅಂಟಿಕೊಂಡವರು ಬಹಳ. ಈ ಆನಂದದ ಆಸೆಯ ಮುಂದೆ ಅದನ್ನು ಹೊಡೆದು ತಿನ್ನಬೇಕೆಂಬ ಆಸೆ ಅರ್ಧದಷ್ಟೂ ಇಲ್ಲವೇನೋ.

ಹುಣ್ಣಿಮೆಯ ರಾತ್ರಿಗಳನ್ನಂತೂ ಅವನು ತಪ್ಪಿಸಿಕೊಳ್ಳುತ್ತಲೇ ಇರಲಿಲ್ಲ. ಹುಣ್ಣಿಮೆಯ ತಿಂಗಳ ಬೆಳಕಿನಲ್ಲಿ ಪ್ರಾಣಿಗಳು ಆಹಾರಕ್ಕಾಗಿ ಬಯಲಿಗೆ ಬರುತ್ತವೆ. ಮರುದಿವಸ ಒಂದು ಮಾಂಸದ ಸಾರಿನ ಸಂಭವ ಹೆಚ್ಚಾಗಿರುತ್ತದೆ. ಸುಮಾರು ಎಂಟು ಗಂಟೆಗೆ ಹೊರಟು ಮಧ್ಯರಾತ್ರಿಯ ಆಸುಪಾಸಿಗೆ ತಿರುಗಿ ಬರುತ್ತಿದ್ದನು. ಚಿಕ್ಕದಾಗಿದ್ದು ಏನಾದರು ಶಿಕಾರಿಯಾದರೆ ಅದನ್ನು ಒಂದು ಪಾತ್ರೆಯಲ್ಲಿ ಮುಚ್ಚಿಟ್ಟು ಮಲಗಿ ಬೆಳಗ್ಗೆ ಎದ್ದು ಮುಂದಿನ ಕಾರ್ಯ ನೋಡುತ್ತಿದ್ದರು. ದೊಡ್ಡದಾಗಿದ್ದರೆ ನಾಲ್ಕು ಜನರು ಸೇರಿ ಮಧ್ಯರಾತ್ರಿಗೆ ತುಕುಡಿಮಾಡಲು ಶುರುಮಾಡುತ್ತಿದ್ದರು. ಅದು ಅತ್ತಿಯ ಹಣ್ಣು ಬಿಡುವ ಕಾಲ. ಇವನಿಗೆ ತಿಳಿದಂತೆ ಬೆಟ್ಟ ಕಾಡಾಗಿ ಬದಲಾಗುವ ಜಾಗದಲ್ಲಿ ಒಂದು ಅತ್ತಿಯ ಮರ ಇತ್ತು. ಹಣ್ಣು ಬಿಡುವ ಕಾಲದಲ್ಲಿ, ಅಲ್ಲಿ ಐದಾರು ಕಾಡುಬೆಕ್ಕು (ಪುನುಗುಬೆಕ್ಕು) ಕಳೆದ ವರ್ಷವಷ್ಟೆ ಹೊಡೆದಿದ್ದನು. ಕಾಡುಬೆಕ್ಕುಗಳು ಬ್ಯಾಟರಿಯ ಬೆಳಕು ಬಿದ್ದಾಗ ತಮ್ಮ ಹೊಳೆಯುವ ಕಣ್ಣುಗಳಲ್ಲಿ ಬೆಳಕನ್ನೆ ದಿಟ್ಟಿಸುತ್ತಾ ಎಲ್ಲಿರುತ್ತವೆಯೋ ಅಲ್ಲಿಯೆ ಕುಳಿತಿರುತ್ತವೆ. ಇದಕ್ಕೆ ಪ್ರಾಣಿಗಳು ಕಣ್ಣುಕೊಡುವುದು ಎನ್ನುತ್ತಾರೆ.

ಆಗ ಸರಿಯಾಗಿ ಗುರಿಯಿಟ್ಟು ಕೋವಿಯಿಂದ ಒಂದು ಈಡು ಹೊಡೆದರೆ ದೊಪ್ಪನೆ ನೆಲಕ್ಕೆ ಬೀಳುತ್ತದೆ. ಅವುಗಳಿಗಾಗಿಯೇ ಅವನು ರಾತ್ರಿ (ಮೆಲ್ಲನೆ) ಕದ್ದು ಸದ್ದಾಗದಂತೆ ಆ ಮರದ ಹತ್ತಿರ ಹೋಗಿ ಮರಕ್ಕೆಲ್ಲಾ ಬ್ಯಾಟರಿ ಬೆಳಕನ್ನು ಅದುಮಿದರೆ ತಲೆಯ ಮುಂದಿರುವ ಬ್ಯಾಟರಿಯ ತಲೆಯಿಂದ ಬೆಳಕು ಬಿಡುತ್ತಿದ್ದನು. ಆ ವರುಷ ಅವನಿಗೆ ಆಶ್ಚರ್ಯವಾಗುವಂತೆ ಯಾವ

ಬ್ಯಾಟರಿ ಬೆಳಕನ್ನು ಬೀರುವುದನ್ನು ನಿಲ್ಲಿಸಲಿಲ್ಲ. ಒಂದು ದಿನ ಆ ಮರದ ಕೇಳಬೇಕೆಂದು ಎದ್ದು ನಿಂತನು, ಎದ್ದು ನಿಂತವನಿಗೆ ಏನು ಕೇಳಬೇಕೆಂದು ಎದುರು ಬೆಳೆದ ಮಟ್ಟಿಯಲ್ಲಿ ಬಗ್ಗ, ಗಿಡಗಳ ಜಿಗ್ಗು ಕಡ್ಡಿಗಳನ್ನೆಲ್ಲಾ ತಿಳಿಯಲೇ ಇಲ್ಲ. ಎಲ್ಲಾ ಮರೆತು ಹೋದ ಹಾಗಾಯ್ತು. ಬ್ಯಾಟರಿಯ ಸ್ವಿಚ್ ನ್ನು ಸದ್ದಾಗದಂತೆ ನಿವಾರಿಸಿ, ಕಾಡು ಹಂದಿಗಳು ನಡೆದು ಸವೆಸಿದ ದಾರಿಯಲ್ಲಿ ಅದುಮಿದ. ಅದು ಹೊತ್ತಿ ಕೊಳ್ಳಲಿಲ್ಲ. ಅದು ಹೊತ್ತಿ ಕೊಳ್ಳಲಿಲ್ಲ ಅನ್ನೋದು ನಿದಾನವಾಗಿ ಕುಕ್ಕರಿಸಿ ಹಾಗೆಯೆ ನಡೆಯುತ್ತಿದ್ದನು. ತಕ್ಷಣ ಮೈಯೆಲ್ಲಾ ಅವನಿಗೆ ಗೊತ್ತಾಗಲಿಲ್ಲ. ಅವಳು ಮಾತನಾಡುವುದನ್ನು ನಿಲ್ಲಿಸಲಿಲ್ಲ, ಬದಲಿಗೆ ಬೆವರಲು ತೊಡಗಿತು. ಯಾರೋ ಮಾತನಾಡುವುದು ಕೇಳಿಸಿತು. ಅದು ಸಹ ಇನ್ನೂ ಪಿಸುದನಿಯಲ್ಲಿ ಮಾತನಾಡತೊಡಗಿದಳು. ಇವನಿಗೆ ಹೆಣ್ಣು ದನಿ. ಯಾರದೋ ಗಂಡಸು ದನಿಯಾಗಿದ್ದರೆ ಅವನು ಆಶ್ಚರ್ಯವಾಗುವಂತೆ ಅವಳು ಮಾತನಾಡುತ್ತಿದ್ದದ್ದು ಇವನಿಗೆ ಹೆದರುತ್ತಿರಲಿಲ್ಲ. ಕೆಮ್ಮಿಯೋ, ಹೋ ಯಾರ್ರೊ ಅದು? ಎಂದು ಕೇಳಿಯೋ ಆಶ್ಚರ್ಯವಾಗತೊಡಗಿತು. ಅವಳು ಯಾರು? ಅವಳು ಯಾಕೆ ಅಲ್ಲಿಗೆ ತನ್ನ ಇರುವಿಕೆಯನ್ನು ಬಹಿರಂಗ ಪಡಿಸುತ್ತಿದ್ದನು. ಗಾಳಿಯು ಇವನಿರುವ ಬಂದಿದ್ದಾಳೆ? ಎಲ್ಲವೂ ಗೊತ್ತಾಗತೊಡಗಿತ್ತು. ಅವಳು ಮಾತನಾಡುತ್ತಿದ್ದ ದಿಕ್ಕಿಗೆ ಬೀಸಿದಾಗ ಆ ದನಿಯು ಸ್ಪಷ್ಟವಾಗಿಯೂ ಗಾಳಿ ಬೀಸುವುದು ನಿಂತಾಗ ಭಾಷೆ ತಾನು ಯಾವಾಗಲೋ ಮಾತನಾಡುತ್ತಿದ್ದು, ಈಗ ಮರೆತಿರುವ ಭಾಷೆ ಮೆಲುದನಿಯಾಗಿಯೂ ಕೇಳುತ್ತಿತ್ತು. ಅವನ ಬೆವರಿದ ಬಿಸಿಮೈಗೆ ತಣ್ಣನೆಯ ತೋರಿತು. ಅವಳ ಮಾತಲ್ಲಿ ಲೆಕ್ಕವಿಲ್ಲದಂತೆ ಮಕ್ಕಳನ್ನು ಹೆತ್ತು ಸಾಕಿದ ಅನುಭವ ತಂದಿತು, ಕಾಲುಗಳು ಬಲಹೀನವಾದವು. ಗಂಡಸಾಗಿದ್ದರೆ ತನ್ನ ತಾಯಿಯ ಲಾಲನೆ ಇತ್ತು. ಲೆಕ್ಕವಿಲ್ಲದಂತೆ ಮಕ್ಕಳನ್ನು ಕಳೆದುಕೊಂಡವಳ ಹಾಗೆ ಹೆಡ್ಲೆಟ್ಗೆ ಬಂದವರಾಗಿರಬಹುದು. ಈ ರಾತ್ರಿ ಹೊತ್ತಿನಲ್ಲಿ ಅದು ವೈರಾಗ್ಯ ಗಾಂಭೀರ್ಯವಿತ್ತು. ಹೆತ್ತಮಕ್ಕಳು ದಾರಿ ತಪ್ಪಿದಾಗ ಮರುಗುವ ಯಾವ ಹೆಂಗಸು ಅಲ್ಲಿಗೆ ಬರುತ್ತಾಳೆ!. ಮುಂದೆ ಹೋಗಿ ಏನು ಎಂದು ತಾಯಿಯ ಮರುಕವಿತ್ತು. ಕೆಲವು ಮಕ್ಕಳು ತನ್ನನ್ನು ಕೈ ಬಿಟ್ಟು ಹೋಗುತ್ತಿರುವ ನೋಡುವ ಧೈರ್ಯನೂ ಇಲ್ಲ. ವಾಪಾಸ್ ಹೋಗಲು ಹಾಳು ನೋವಿತ್ತು. ತಾಯಿಯ ಕತ್ತನ್ನೇ ಹಿಸುಕುವ ಮಕ್ಕಳನ್ನು ಪಡೆದ ತಾಯಿಯಂತೆ ಕುತೂಹಲಾನೂ ಬಿಡುತ್ತಿಲ್ಲ. ಅವನಿಗೆ ಹಗಲೂ ರಾತ್ರಿ ಕಾಡಿನಲ್ಲೆಲ್ಲಾ ಅಲೆದು ಮಾತನಾಡುತ್ತಿದ್ದಳು. ಇವನಿಗೆ ಎಲ್ಲವೂ ಅರ್ಥವಾಗುತ್ತಿತ್ತು. ಅವಳ ಮಾತಿನಲ್ಲಿ ಅಲೆದು ದೆವ್ವ ಭೂತಗಳ ಮೇಲೆ ನಂಬಿಕೆ ಹೋಗಿತ್ತು. ಅವುಗಳು ಒಂದು ಜಗತ್ತನ್ನೇ ಆಳಿದವಳ ಮಾತಿನಲ್ಲಿನ ಗಾಂಭೀರ್ಯ, ಗಡಸು ಕಾಣಬರುತ್ತಿತ್ತು. ವೇಳೆ ಅಸ್ಥಿತ್ವದಲ್ಲಿದ್ದರೂ, ಕೋವಿ ಹಿಡಿದವನೆದುರು ಬರುವುದಿಲ್ಲ ಎಂದು ಅವಳು ಅಳುತ್ತಿರಲಿಲ್ಲ. ಅವಳಿಗೀಗ ಬಂದ ದುರ್ಗತಿ ತಾನು ಬಲವಾಗಿ ನಂಬಿದ್ದನು. ಆದರೂ ಈಗ ಕೇಳಿ ಬರುತ್ತಿರುವ ಧ್ವನಿ ಮಾನವ ಅನುಭವಿಸಲೇಬೇಕಾಗಿರುವ ಕರ್ಮವೆಂಬಂತೆ ನಿರ್ಭಾವುಕಳಾಗಿದ್ದಳು. ಧ್ವನಿಯಲ್ಲ ಎನಿಸಿತು. ಇದ್ದ ಚೂರುಪಾರು ಧೈರ್ಯವನ್ನೊಡಗೂಡಿಸಿ ಇವನಿಗೆ ಅವಳು ತನ್ನನ್ನು ಕುರಿತು ಮಾತನಾಡುತ್ತಿಲ್ಲ ಎನಿಸಿತು. ಸ್ವಲ್ಪ ಹೊತ್ತಿಗೆ ನಿದಾನವಾಗಿ ಮುಂದೆ ಹೋದನು. ಆಗ ಮಾತುಗಳು ಸ್ಪಷ್ಟವಾಗಿ ತನಗಿದ್ದರೂ ಇರಬಹುದೆನಿಸಿತು. ಆಮೇಲೆ ತನಗೇ ಎನಿಸಿ ಭಯವಾಯಿತು. ಕೇಳುತ್ತಿದ್ದವು. ಆದರೆ ಅದು ಅವನಿಗೆ ಅರ್ಥವಾಗಲಿಲ್ಲ. ಆಕೆ ಅವನು ಅವಳು ಮಾತನಾಡಲೋಸುಗ ಜೀರುಂಡೆಗಳು, ದೂರದಲ್ಲಿ ಆಗಾಗ ಕೂಗುವ ಈವರೆಗೂ ಕೇಳಿದ, ಇರುವಿಕೆಯನ್ನು ತಿಳಿದ ಯಾವ ಭಾಷೆಯಲ್ಲಿಯೂ ಗೂಬೆಯು, ಬೊಂಬುಗಳನ್ನು ತೇದು ಸದ್ದು ಹೊರಡಿಸುವ ಬಿದಿರು, ಹೀಗೆ ಮಾತನಾಡುತ್ತಿರಲಿಲ್ಲ. ಕೋವಿಯನ್ನು ಎತ್ತಿ ಭುಜಕ್ಕೊತ್ತಿ ಹಿಡಿದು ಎದುರಿಗೆ ಕಾಡಿನಲ್ಲಿ ರಾತ್ರಿ ಸಾಮಾನ್ಯವಾಗಿ ಸದ್ದುಮಾಡುವವೆಲ್ಲವೂ ಸುಮ್ಮನಿದ್ದವು. ಇಲ್ಲಿ ಏನಾದರು ಕದಲಿದರೆ ಟ್ರಿಗರ್ ಒತ್ತುವ ಹಾಗೆ ಮುಂದುವರಿದನು. ಅತ್ತಿಯ ಅವಳು ಬಹಳ ದಿನ ಇರುವವಳಲ್ಲ ಎಂಬ ವಾಸ್ತ್ಯವೂ ಅವನಿಗೆ ಮರದಿಂದ ಸ್ವಲ್ಪ ದೂರದಲ್ಲಿ ಅವನು ಬರುತ್ತಿದ್ದ ದಾರಿ ಕೊನೆಯಾಗುವಲ್ಲಿ ಹೊಳೆಯಿತು. ಅವಳು ತನ್ನ ಬದುಕಿನ ಬಗ್ಗೆ ಭರವಸೆಯನ್ನು ಬದುಕಬೇಕೆಂಬ ನಿಂತು ಬ್ಯಾಟರಿ ಬೆಳಕನ್ನು ಬೀರಿದ. ಅಲ್ಲಿ ಯಾರೂ ಇರಲಿಲ್ಲ. ಸದ್ದು ನಿಂತಿತು. ಆಸೆಯನ್ನೂ ಮತ್ತು ಬದುಕನ್ನು ಮೂರನ್ನೂ ಕಳೆದುಕೊಂಡಿದ್ದವಳಂತೆ ಅವನಿಗಾದ ದುಗುಡ, ತುಮುಲ, ನಡುಕ ಯಾವುದೂ ಅವನಿಗೆ ನೆನಪಿಲ್ಲ. ಕಂಡಳು. ಇವನಿಗೆ ತಾನು ತಿರುಗಿ ಏನು ಹೇಳಬೇಕೆಂದು ಗೊತ್ತಾಗಲಿಲ್ಲ. ಅವನ ಮನಃಪಟಲದಲ್ಲಿ ಉಳಿದಿಲ್ಲ. ಬ್ಯಾಟರಿಯ ಬೆಳಕನ್ನು ಸುತ್ತಲೂ, ಹೇಳಿದರೂ ಅದು ಅವಳಿಗೆ ಅರ್ಥವಾಗುವ ನಂಬಿಕೆ ಇರಲಿಲ್ಲ. ಅವಳ ಮೇಲೂ, ಕೆಳಗೂ ತಕ್ಷಣ ತಿರುಗಿ ತನ್ನ ಹಿಂದಕ್ಕೆ ಬಿಟ್ಟದ್ದು ಮತ್ತು ಮನೆಗೆ ಭಾಷೆಯನ್ನು ತಾನು ಎಂದೋ ಮರೆತಂತೆ ಅನಿಸಿತು. ಮಾತೆಲ್ಲಾ ಮುಗಿಸಿ ಬಂದು ಮಲಗಿದ್ದು ಅಷ್ಟೆ ಅವನ ನೆನಪಿನಲ್ಲಿದೆ. ಈ ರೀತಿ ಐದಾರು ರಾತ್ರಿ ಒಂದು ದೀರ್ಘ ನಿಟ್ಟುಸಿರಿಟ್ಟು ಮಾತನ್ನು ನಿಲ್ಲಿಸಿದಳು. ಆ ನಿಟ್ಟುಸಿರು ಅವಳ ನಡೆಯಿತು. ಅವನು ಹೋಗುವುದು, ಯಾರೋ ಹೆಂಗಸು ಬೇಸರ, ಹತಾಷೆ, ನೋವು, ಅಭದ್ರತೆ ಎಲ್ಲವನ್ನೂ ಗಾಳಿಯಲ್ಲಿ ತೇಲಿಬಿಟ್ಟಿತು. ಮಾತನಾಡುವುದು, ಇವನು ಬ್ಯಾಟರಿ ಬೆಳಕು ಬೀರಿದ ಕೂಡಲೆ ಮಾತು ಆ ಗಾಳಿಯು ಇವನ ಮುಖಕ್ಕೆ ಬಡಿದು ತಣ್ಣೆನೆಯ ಅನುಭವವನ್ನೇ ನೀಡಿತು. ನಿಲ್ಲಿಸುವುದು. ಅಲ್ಲಿ ಯಾರೂ ಇಲ್ಲದೆ ಇರುವುದು. ಹೀಗೆ ಇವನು ಅದು ದೆವ್ವ ಅವಳು ಮಾತು ನಿಲ್ಲಿಸಿದ ಕೂಡಲೆ ಜೀರುಂಡೆಗಳು ಅವಳ ಮಾತಿನಂತೆ ಭೂತಗಳ ಚೇಷ್ಟೆ ಇರಲಿಕ್ಕಿಲ್ಲ ಎಂದುಕೊಂಡನು. ದೆವ್ವ ಭೂತಗಳನ್ನು ನಮಗರ್ಥವಾಗದ ಹಾಗೆ ಜಿರ್, ಜಿರ್ ಎಂದು ಜೀರ್ದನಿಸತೊಡಗಿದವು. ನೋಡಿದವರಿಗೆ ಮಾರನೆ ದಿನ ಕೆಂಡದಂತೆ ಮೈಸುಡುವ ಜ್ವರ ಬರುತ್ತದೆಂದು ಅಲ್ಲಿಯವರೆಗೂ ಸುಮ್ಮನಿದ್ದವನು ಪಕ್ಕನೆ ನೆನಪಾದಂತೆ ಸ್ವಿಚ್ ಅದುಮಿದ ಕೇಳಿ ತಿಳಿದಿದ್ದ. ಅವರಲ್ಲಿ ಕೆಲವರು ಸತ್ತರೆ, ಕೆಲವರು ದೇವರಿಗೆ ಬ್ಯಾಟರಿ ಹೊತ್ತಿತು. ಅಲ್ಲಿ ಯಾರೂ ಇರಲಿಲ್ಲ. ಹೇಳಿಕೊಂಡಿದ್ದರಿಂದ ಉಳಿದುಕೊಂಡಿದ್ದರು. ಆ ರಾತ್ರಿ ಏನಾದರಾಗಲಿ ನೀನು ಯಾರು? ಎಂದು ಕೇಳಿಯೇ ಬಿಡಬೇಕೆಂದು ದೃಢ ನಿಶ್ಚಯಮಾಡಿ ಹೊರಟನು.

ಬೇಣವನ್ನು ದಾಟಿ ಬೆಟ್ಟವನ್ನು ಹೊಕ್ಕು ನಿಧಾನವಾಗಿ ಆ ಮರದ ಹತ್ತಿರ ಬಂದು, ಬಗ್ಗಿ ನಿಧಾನವಾಗಿ ಕೂತಲ್ಲಿಯೇ ಹೆಜ್ಜೆಯ ಮೇಲೆ ಹೆಜ್ಜೆಯನ್ನಿಡುತ್ತಾ ಮರದ ಹತ್ತಿರ ಬಂದನು. ಸಾಕಷ್ಟು ಹತ್ತಿರ ಬಂದವನೆ ನೀನು ಯಾರೆಂದು

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🖄 ಗುರುರಾಜ ಎನ್. ಕೆ. ಛೀಫ್ ಮ್ಯಾನೇಜರ್ – ಇಲೆಕ್ಟೀಕಲ್



# Edition 3





# Whip your grey matter and solve this puzzle....

1

# ACROSS

- 3 This Nobel Prize cannot be divided between three candidates
- 7 One of the ingredients of Greek dish tzatziki
- **10** A large marsupial
- 11 Malassezia globose
- 14 God is with us
- **15** Aphrodite and her son Eros transformed in order to escape the monster Typhon
- **17** Word of praise when Jesus made his triumphal entry into Jerusalem
- 18 Royal House to rule an independent Scotland
- 19 Cirith Ungol
- 21 The warden of the north
- **22** Passing the point of no return
- 24 Wine brought to room temperature

'You ask, what is our aim? I can answer that in one 2 word'

DOWN

- 2 Qualis Artifex pereo
- 4 On either side of the Danube
- 5 Inspired by the Sanyasi Rebellion
- 6 Battle of Alesia
- 8 Swedish word used for an official who investigates complaints
- **9** The city in which the classic car chase takes place in 1969 The Italian Chase
- 12 The toe of Italy
- 13 This surname indicates that an ancestor was a maker or seller of arrows
- **16** A collective noun
- 20 The raaga of fire
- **21** To satisfy something, such as a thirst
- 23 Phase of the moon when it is more than half, but not full



# **Daylight Zone**



Name : Sanath B. Shetty Date of joining : 1.8.2023 **Position : Management Trainee** Job location : Mangaluru Native place : Bantwala, KA Interests : Trekking, Gardening, Badminton



Name : Devinand Prabhu Date of joining : 1.8.2023 **Position : Management Trainee** Job location : Mangaluru Native place : Karkala, KA Interests : Numismatics, Cricket, Badminton



Name : Shiv Shashank Shetty Date of joining : 1.8.2023 **Position : Management Trainee** Job location : Mangaluru Native place : Mangaluru, KA Interests : Trekking, Music, Cricket



Name : Chethan Shenoy Date of joining : 1.8.2023 **Position : Management Trainee** Job location : Mangaluru Native place : Padubidri, KA Interests : Chess, Geopolitics Talent : Speed Math



Name : Bhuvan Date of joining : 1.8.2023 **Position : Junior Management Trainee** Job location : Mangaluru Native place : Bantwala, KA Interests : Video and photo editing, Drawing



Name : Likhith Date of joining : 1.8.2023 **Position : Junior Management Trainee** Job location : Mangaluru Native place : Mangaluru, KA Interests : Trekking, Travelling, Cricket, Volleyball



Name : Manjunath A Revadi Date of joining : 1.8.2023 **Position : Junior Management Trainee** Job location : Mangaluru Native place : Bagalkote, KA Interests : Bike riding, Trekking, Kabaddi



Name : Nevil Lasrado Date of joining : 1.8.2023 **Position : Junior Management Trainee** Job location : Mangaluru Native place : Bantwala, KA Interests : Travelling, Music, Volleyball



Name : Suman Date of joining : 1.8.2023 **Position : Junior Management Trainee** Job location : Mangaluru Native place : Mangaluru, KA Interests : Travelling, Drawing

**Position : Junior Management Trainee** 

Name : Sukesha

Date of joining : 1.8.2023

Job location : Mangaluru Native place : Mangaluru, KA

Interests : Travelling, Music

Talent : Solving Rubik's Cube





Name : Punit K Date of joining : 7.8.2023 Position : Officer – Stores Job location : Mangaluru Native place : Kundapura, KA Interests : Gardening, Reading, Cricket



Name : Adarsh Date of joining : 1.9.2023 **Position : Management Trainee** Job location : Mangaluru Native place : Karkala, KA Interests : Swimming, Chess, Cricket, Basketball





Name : Adlyn Rithesh D'Souza Date of joining : 1.9.2023 Position : Management Trainee Job location : Mangaluru Native place : Mangalore, KA Interests : Travelling, Movies



Name : Chethan Date of joining : 1.9.2023 Position :Junior Management Trainee Job location : Mangaluru Native place : Bantwala, KA Interests : Cricket, Movies, Badminton



Name : Deekshith Date of joining : 1.9.2023 Position : Junior Management Trainee Job location : Mangaluru Native place : Udupi, KA Interests : Cricket, Fishing, Badminton



Name : P L Karthik Date of joining : 1.9.2023 Position : Junior Management Trainee Job location : Mangaluru Native place : Kadaba, KA Interests : Travelling, Kabaddi

# **Twilight Zone**



Raghunatha Sr. Engineer – Electrical 38 years of service

# Obituary



# Bhaskar U

Assistant Officer - Electrical Left for the heavenly abode on 20th July 2023

# From page 22 Edition 3

# Cognitate

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# Cognitare Edition 2 - Correct Answers

Blonde hair, 2. Psychedelic mushrooms
Iron, 4. Giraffe, 5. Meteoroids, 6. Arsenic
Getting goosebumps, 8. Mitochondria

# Winner by draw of lots

We received 14 entries and all the entries had correct answers. But the prize goes to only to one and that is **Sandesh Kumar**, **Senior Engineer (Production – Ammonia), E. No. 303245.** You win Rs.1000 cash prize. Congratulation champ... Write the correct answers in the grid and send the clear picture of the grid to mangala.vartha@adventz.com within 30 November. Entry with all correct answers will win a Rs. 1000 cash prize.

# Let's Celebrate



# Mohammed Nadeem Shaikh Chief Manager – Electrical

Passed the Energy Auditor Examination conducted by Bureau of Energy Efficiency, Government of India on 1 January 2023. He is now a certified Energy Auditor. Congratulations Nadeem. Way to go!!!!



# Adarsh B Attavar S/o Bharath Attavar – Maintenance

Bagged overall Gold, Gold in Sqaut, Silver in Bench Press and Gold in Dead Lift at World Junior Powerlifting Championship held at Cluj, Romania in August 2023. Congratulations Adarsh. You have made us proud.



# Mahesh D Kuratti Marketing Officer – Gangavathi

Took vows with Vidyashri on 11 June 2023. Congratulations. May the years ahead be filled with love and joy Mahesh and Vidya!!!



# A Boopathi Marketing Officer – Coimbatore Tied the knot with S Shanmugapriya on 7 June 2023. Congratulations. Wishing you a lifetime of love and happiness Boopathi and Shanmugapriya!!!



Avinash Kitta Regional Marketing Officer – Raichur

Walked down the aisle with Swapna on 14 June 2023. Congratulations. May the love you share today grow stronger as you grow old together Avinash and Swapna!!!





In this edition of Salt N' Pepper, we present to you two famous fish preparations – Fish Mappas from Kerala and Machher Jhol from Bengal. Try it with appams or rice, and indulge your taste buds. Recipe courtesy – Nish Kitchen

### **Fish Mappas**

### Ingredients (for 5 servings)

- Silver pomfret fish cut into medium pieces 500g
- Mustard seeds 1tsp
- Ground coriander 1tsp
- Medium-sized onion 2
- Coconut milk 1/3 cup
- Shallots, sliced 8
- Garlic paste 2 tsps
- Ginger paste 1tsp
- Mustard seeds 1tsp
- Cumin seeds and fenugreek seeds ¼ tsp each
- Turmeric powder and freshly grated black pepper ½ tsp each
- Dried red chillies 3
- Lemon-sized tamarind soaked in water
- Vinegar 1tsp
- Oil ½ cup
- Green chillies cut in half ad medium tomato sliced 2 each
- A pinch of Asafoetida
- Curry leaves 1 sprig
- Salt to taste

# Ingredients to marinate fish

- Turmeric powder ¼ tsp
- Chilli powder 2 tsp
- Salt to taste

# Preparation

- Marinate fish with turmeric powder, chilli powder, and enough salt for one hour. Heat oil in a pan and shallow fry the fish pieces in batches. Keep aside.
- Add the remaining oil into the pan, and splutter mustard, fenugreek, and cumin seeds. Add shallots, green chillies, and curry leaves. Fry until the shallots become golden brown in colour. Add ginger garlic paste, and fry until a nice aroma is released.
- Add asafoetida, turmeric powder, ground coriander, and chilli powder. Fry for a few seconds, and season with black pepper. Add tomatoes and cook. When the oil separates, add tamarind extract.
- At this stage, add fish, cover it with a lid and cook. When the fish is cooked, check the seasonings and add vinegar. Add curry leaves. Allow the fish curry to boil. Add coconut milk and remove from flame. Serve hot with appams.

# Machher Jhol

# Ingredients (for 4 servings)

- King fish cut into cutlets 1kg
- Large potatoes peeled and cut into large cubes 3
- Large onion, roughly chopped 1
- Mustard oil 1tbsp
- Cumin seeds 1tsp
- Bay leaf 1
- Cardamom pods 3
- Ginger and garlic paste 1tbsp
- Green chili, sliced 1
- Tomato purée 2 tbsp
- Turmeric powder ½ tsp
- Coriander powder 1tsp
- Yoghurt 5 tbsp
- Water 1 cup

## Preparation

## Marinate and fry fish



Coat fish with ½ teaspoon ground turmeric. Season with salt. Marinate for 30 minutes in the refrigerator. Heat 1 tbsp mustard oil in a large frying pan. Add fish. When one side is browned, flip over to brown the other side. Set aside.

## Potatoes & eggplants

 Marinate potatoes and eggplants (if using) with ½ teaspoon turmeric powder. Season with salt. Add potatoes to the same pan used for frying fish. Shallow fry until both sides are brown. If you are using eggplants too, fry eggplants (2 small size, sliced) and set aside.

# **Fish curry**

- Heat oil in a large frying pan over medium-high heat. Add cumin seeds, bay leaf and cardamom pods. Sauté, stirring constantly, for a minute or until fragrant. Grind onion to a smooth paste and add. Sauté, stirring occasionally, for 1-2 minutes or until slightly browned. Add ginger, garlic and green chillies. Sauté, stirring occasionally, for 1-2 minutes or until fragrant.
- Add tomato paste. Sauté, stirring occasionally, for 1 minute. Add turmeric and coriander powder. Sauté, stirring, for a minute or until fragrant. Add yoghurt. Stir to combine. Simmer for 2-3 minutes or until oil separates. Add potatoes and eggplants.
- Pour water. Stir to combine. Cook, covered, for 2-3 minutes or until potatoes are tender. Add fried fish. Stir gently. Cook, covered, for 5 minutes or until fish is cooked through and sauce is slightly thickened.

# **Mangala Specialty Fertilizers**

Specialty Fertilizers are a diverse group of fertilizers containing one or more essential primary, secondary and micro-nutrients. Primary nutrients are Nitrogen (N), Phosphorous (P), and Potassium (K). Secondary nutrients are Calcium (Ca), Magnesium (Mg) and Sulphur (S). Micro-nutrients are Iron (Fe), Zinc (Zn), Manganese (Mn), Copper (Cu), Boron (B) and Molybdenum (Mb). Primary and secondary nutrients are collectively known as macro-nutrients. The requirement of primary nutrients is typically 100 kg/ha, that of secondary nutrients is 10 kg/ha and micro-nutrients is 1kg/ha of crops.

MCF offers a diverse range of Specialty Fertilizers - Water Soluble Fertilizers and Micro-Nutrient Fertilizers. These products are sold under the popular brand name Mangala. In this issue of Mangala Vartha, we will focus on the Water Soluble Fertilizers (WSF) manufactured and traded by MCF. Water soluble fertilizers (WSF) are readily soluble in water. WSF achieves this by releasing essential plant nutrients at the root zone from where they are easily absorbed and used elsewhere in the plant system. WSF can be sprayed on the leaves of the crop (foliar application) or they can be applied through an irrigation system (fertigation application). WSF has many benefits for its users. About 25- 30% of the recommended dose of fertilizer can be reduced by using WSF. Essential nutrients can be applied uniformly to every crop daily. Due to foliar and fertigation application techniques, WSF avoids nutrient loss, which is common in the ground application of fertilizers. This enhances the nutrient use efficiency. WSF manufactured by MCF and traded by ZFHL are explained in next paragraphs.

### Mangala NPK 19:19:19 and Mangala NPK 13:40:13

Mangala NPK 19:19:19 has all the three major plant nutrients viz., Nitrogen, Phosphorus and Potash in equal proportion (19%), whereas Mangala NPK 13:40:13 has Nitrogen, Phosphorus and Potash in the proportion 13%, 40% and 13% respectively.

### Mangala Calcium Nitrate

Mangala Calcium Nitrate is a unique fully water-soluble fertilizer containing one major (Nitrogen) and one secondary (Calcium) plant nutrient. Calcium is a 'quality nutrient' that enhances the quality and shelf life of produce. The nitrate-nitrogen in the fertilizer is readily absorbed by the plant and improves the efficiency of Calcium uptake. Mangala Calcium Nitrate is free from Sodium and Chlorides, which may be harmful to some crops.

#### Mangala 12:61:0 (Mono Ammonium Phosphate)

Mangala 12:61:0 has two major plant nutrients viz., Nitrogen and Phosphorus. The product is a highly concentrated source of Phosphorous for plants. It is Ideal for application in the initial stages of crop growth as Phosphorus is very important for the development of a proper root system. Also, the Nitrogen in the product helps vigorous vegetative growth. Ammonium in the product reduces the pH of the soil surrounding the root system, which in turn helps quick and easy absorption of Phosphorus from the soil.

### Mangala 0:54:34 (Mono Potassium Phosphate)

Mangala 0:54:34 has two major plant nutrients viz., Phosphorus and Potassium. The product is a highly concentrated source of both Phosphorus and Potassium for plants. It is ideal for application at the reproductive (fruit setting) stage of fruit crops. This increases sugar content in the fruit and hence quality of the fruits.

### Application of WSF

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Mangala Water Soluble Fertilizers can be applied to all crops, plants and trees like paddy, maize, sugarcane, chilli, black pepper, banana, grapes, potato, coconut, cotton, tomato, garden flowers, shrubs etc. WSF is free-flowing and easy to handle. These products can be fully dissolved in water and then applied to the crop. They are suitable for both foliar spraying and fertigation. For foliar application, the recommended dosage is 4-5 g/l of water. For fertigation application, the recommended dosage is 1-3 kg/acre of irrigated area. The number of times of application using the fertigation technique depends upon the type of the crop, and the dosage is based on the results of soil analysis, the crop and its growth stage.

All the products are available in 1kg and 25kg packs.

Sunith S

Manager (Production Planning)



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