

NIIR PROJECT CONSULTANCY SERVICES

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CLIENT CASE STUDY

Strategic Investment in Citric Acid Manufacturing

Transforming Industrial Vision into a Profitable Manufacturing Reality

Client: M/s. Indian Potash
Ltd

Location: Coimbatore,
Tamil Nadu

Project: Citric Acid
Manufacturing Unit

Status: Approved for
Execution

Industry: Large-Scale
Industrial

Service: Techno-Economic
Feasibility & DPR

ABOUT NPCS

Who We Are

Niir Project Consultancy Services (NPCS) is one of Asia's most trusted industrial knowledge and advisory organizations. With over three decades of consulting excellence, NPCS has been the backbone of thousands of industrial ventures across India and globally — from conceptualization through to commissioning.

NPCS is part of Asia's leading industrial knowledge ecosystem with thousands of project profiles and global consulting expertise.

Our multidisciplinary team of engineers, economists, market analysts, and industry specialists provides clients with unbiased, data-driven advisory services that transform investment intent into implementation readiness.

CORE SERVICES

DPR Detailed Project Reports	TEF Techno-Economic Feasibility	MR Market Research & Analysis	EA Engineering Advisory
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OUR AUTHORITY IN NUMBERS

85 Countries Served	150K+ Clients Served	150K+ Successful Projects Delivered	30+ Years in Consulting
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NPCS combines deep industrial domain knowledge with cutting-edge market intelligence to deliver feasibility studies and DPRs that are recognized by banks, financial institutions, government bodies, and private investors across 85 countries.

CLIENT OVERVIEW

M/s. Indian Potash Ltd — Client Profile

CLIENT NAME	M/s. Indian Potash Ltd
INDUSTRY	Agri-Input & Industrial Supply / Large-Scale Manufacturing
LOCATION	Coimbatore, Tamil Nadu, India
PROJECT RECOMMENDED	Citric Acid Manufacturing Unit
CONSULTANCY TYPE	Techno-Economic Feasibility Study & Detailed Project Report (DPR)
IMPLEMENTATION STATUS	Approved — Proceeding to Project Execution Phase

Client Background & Investment Objective

M/s. Indian Potash Ltd is a reputed name in India's agri-input and industrial supply ecosystem. Seeking to diversify beyond their traditional portfolio, the organization identified manufacturing as a high-growth opportunity with strong long-term fundamentals.

The client approached NPCS with a clear and structured mandate — to identify and evaluate a large-scale manufacturing opportunity that could be strategically implemented in Coimbatore, Tamil Nadu, capitalizing on the region's logistics advantages, agro-industrial linkages, and established industrial infrastructure.

Strategic Objectives

- Long-term profitability and sustained revenue generation
- Operational scalability aligned with market growth trajectory
- Sustainable and locally available raw material sourcing
- Market resilience with diversified end-user segments
- Industrial-grade demand visibility across B2B sectors

PROBLEM STATEMENT

Challenges & Investment Gaps Addressed

Before engaging NPCS, M/s. Indian Potash Ltd faced several critical challenges that required expert advisory intervention:

CHALLENGE	NPCS RESPONSE
Market Identification Gap — uncertainty on which	Multi-parameter sector evaluation leading to citric

product segment to enter	acid recommendation
Technical Feasibility Uncertainty — lack of clarity on production technology	Detailed technical process evaluation and machinery analysis
Financial Risk Assessment — limited in-house capacity for ROI/IRR modeling	Comprehensive financial modeling with IRR, payback period projections
Supply Chain Complexity — sourcing of carbohydrate substrates for fermentation	Location-specific raw material availability study for TN region
Regulatory & Compliance Complexity — environmental, licensing requirements	Regulatory guidance incorporated into DPR implementation roadmap

OUR APPROACH & STRATEGY

NPCS Consulting Methodology

NPCS employs a structured, five-phase consulting methodology that ensures every recommendation is grounded in rigorous data analysis, market intelligence, and technical validation.

PHASE 1 Project Identification	<ul style="list-style-type: none"> ✓ Sector screening across 50+ manufacturing verticals ✓ Alignment with client's capital appetite, regional strengths, and strategic goals ✓ Preliminary shortlisting of high-potential opportunities
PHASE 2 Market Analysis	<ul style="list-style-type: none"> ✓ Domestic demand-supply gap analysis ✓ Import substitution opportunity mapping ✓ Export potential assessment — Asian, Middle Eastern, and African markets ✓ Competitive landscape and pricing benchmarks
PHASE 3 Technical Feasibility	<ul style="list-style-type: none"> ✓ Process technology evaluation for fermentation-based citric acid production ✓ Machinery selection and equipment sourcing guidance ✓ Utility requirement assessment (water, steam, power) ✓ Plant layout and infrastructure planning
PHASE 4 Financial Modeling	<ul style="list-style-type: none"> ✓ Capital investment estimation (civil, machinery, utilities, working capital) ✓ Revenue projections based on production capacity and market pricing ✓ IRR, NPV, and payback period computation ✓ Sensitivity analysis for risk scenarios
PHASE 5 Implementation Strategy	<ul style="list-style-type: none"> ✓ Phased project implementation roadmap ✓ Risk identification and mitigation framework ✓ Regulatory and licensing pathway guidance ✓ Strategic advisory for long-term scalability

SCOPE OF SERVICES DELIVERED

End-to-End Consultancy Services

NPCS delivered a comprehensive suite of consultancy services, culminating in a bankable Detailed Project Report (DPR) that serves as the strategic blueprint for the entire project lifecycle.

<ul style="list-style-type: none"> ✓ Market Demand & Competition Analysis ✓ Raw Material Sourcing Assessment 	<ul style="list-style-type: none"> ✓ Capital Investment Estimation ✓ Financial Viability & Profitability Projections
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- ✓ **Technical Process Evaluation**
- ✓ **Plant Layout & Machinery Selection**

- ✓ **Risk Assessment & Mitigation Strategies**
- ✓ **Implementation Planning & Regulatory Guidance**

BUSINESS OPPORTUNITY IDENTIFIED

Why Citric Acid Manufacturing?

After conducting a comprehensive techno-economic feasibility study and location-based industrial assessment, NPCS recommended the establishment of a Citric Acid Manufacturing Unit as the optimal investment avenue for M/s. Indian Potash Ltd.

Key End-Use Industries for Citric Acid

Food & Beverage	Pharma & Health	Cosmetics & Personal Care	Detergents & Cleaners	Textile Processing	Industrial Chemicals
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NPCS Recommendation Rationale

- Abundant availability of carbohydrate-rich substrates (molasses, maize) in Tamil Nadu and neighboring regions
- Established fermentation-based production technology with proven scale-up track record
- Continuous institutional demand from food processors, pharmaceutical companies, and FMCG manufacturers
- Favorable industrial policies and infrastructure in Coimbatore's manufacturing ecosystem
- Moderate capital investment relative to production capacity and projected revenues
- High export potential across Asian, Middle Eastern, and African markets
- Alignment with green manufacturing: waste utilization and by-product valorization opportunities

TECHNICAL INSIGHTS

Manufacturing Process Overview

Citric acid is produced through a submerged aerobic fermentation process using *Aspergillus niger* or *Candida* species on carbohydrate substrates. The integrated production process follows a rigorously controlled multi-step pathway:

1	Raw Material Preparation — Molasses/maize substrate preparation, sterilization, and pH adjustment
2	Inoculum Development — Preparation of fungal seed culture under controlled aseptic conditions
3	Fermentation — Aerobic submerged fermentation in stainless-steel bioreactors (72–96 hours)
4	Broth Filtration — Separation of mycelium from fermentation broth via rotary drum filters
5	Precipitation — Addition of lime to precipitate calcium citrate; filtration and washing
6	Acidulation — Treatment of calcium citrate with sulfuric acid to release citric acid
7	Purification — Activated carbon treatment, ion exchange resin polishing for food-grade purity

8	Crystallization & Drying — Evaporation, crystallization, centrifugation, and fluidized bed drying
9	Packaging & QC — Automatic filling into food-grade packaging; quality testing per FSSAI / IP standards

MARKET & FINANCIAL ANALYSIS

Market Opportunity & Demand Outlook

Domestic Market Drivers

- Rapid expansion of India's processed food and beverage industry
- Growing pharma sector consumption of citric acid as excipient and buffer
- Rising demand for biodegradable and eco-certified cleaning agents
- Surge in nutraceutical and health supplement manufacturing
- Increase in flavored beverages, dairy, and confectionery production

Export Market Advantage

- Global shift toward natural fermentation-based organic acids
- Indian manufacturers well-positioned for Asia-Pacific and Middle East exports
- Cost competitive advantage vs. Chinese and European producers
- Growing demand from Africa's emerging food processing sector
- NPCS identified compelling import substitution opportunity in domestic market

IMPORT SUBSTITUTION OPPORTUNITY

India's domestic citric acid production significantly lags consumption, creating a compelling import substitution opportunity. New domestic manufacturing capacity directly addresses this gap, reducing import dependency and capturing substantial market share.

Investment & Financial Overview

NPCS conducted a thorough cost-benefit analysis covering all capital and operational parameters to determine project viability and investor returns:

CAPITAL INVESTMENT COMPONENTS	FINANCIAL PERFORMANCE INDICATORS
<ul style="list-style-type: none"> • Land acquisition and site development • Civil construction and plant buildings • Fermentation systems and bioreactors • Downstream processing machinery • Utility systems — boiler, ETP, power • Packaging and logistics infrastructure • Pre-operative and working capital requirements 	<p>Investment Range: Feasible for large-scale industrial setup</p> <p>IRR: Attractive returns based on market pricing benchmarks</p> <p>Payback Period: Favorable timelines aligned with sector norms</p> <p>NPV: Positive net present value at conservative assumptions</p> <p>Break-Even: Early break-even supported by institutional demand</p> <p><i>Note: Detailed financial projections are available in the complete NPCS DPR.</i></p>

PROJECT EXECUTION

Phase-wise Implementation Roadmap

The NPCS DPR provides a structured, milestone-driven implementation plan to guide the client through each critical phase of project execution with minimal delays and maximum capital efficiency.

PHASE	MILESTONE	KEY DELIVERABLE
Pre-Project	Project Advisory & DPR Delivery	Approved Detailed Project Report & financial model
Phase I	Site Finalization & Statutory Clearances	Environmental NOC, factory license, land registration
Phase II	Civil Construction & Infrastructure	Plant buildings, ETP, utilities, warehouse ready
Phase III	Machinery Procurement & Installation	Bioreactors, filtration, crystallization systems commissioned
Phase IV	Trial Production & Quality Validation	First batch citric acid produced; QC certification obtained
Phase V	Commercial Launch & Market Entry	Full-scale production; institutional sales agreements signed

RESULTS & OUTCOMES

Value Delivered to M/s. Indian Potash Ltd

The NPCS engagement delivered measurable and strategic value across multiple dimensions, enabling the client to proceed with investment confidence:

Strategic Benefits

- Entry into a high-demand specialty chemical segment
- Diversified revenue streams beyond agri-input business
- Reduced dependency on external citric acid suppliers
- Strong domestic and export market positioning
- Alignment with sustainability and green manufacturing trends

Operational Benefits

- Clear technical roadmap eliminating trial-and-error in setup
- Bankable DPR accepted by financial institutions for funding
- Regulatory pathway identified — faster licensing and clearances
- Scalable fermentation technology with future capacity expansion path
- Risk mitigation strategies embedded in implementation plan

CLIENT TESTIMONIAL

What Our Client Says



NPCS provided us with a comprehensive and professionally structured project report for the proposed Citric Acid Manufacturing Unit. The feasibility insights, cost estimations, and market analysis enabled us to make an informed investment decision. We appreciate the depth of technical and financial evaluation delivered by the NPCS team and look forward to implementing the project as per their recommendations.

— M/s. Indian Potash Ltd, Coimbatore, Tamil Nadu

WHY CHOOSE NPCS

The NPCS Advantage

- ✓ Proven industrial expertise across 85 sectors globally
- ✓ Deep global market understanding and trade intelligence
- ✓ Data-driven feasibility studies backed by primary research
- ✓ Bankable DPRs accepted by leading financial institutions
- ✓ End-to-end project support from concept to commissioning
- ✓ Risk mitigation framework built into every engagement
- ✓ Unbiased, independent advisory with client-first approach
- ✓ Network spanning 85 countries with 150K+ clients served globally

CONCLUSION

Strategic Value Delivered

This successful collaboration between NPCS and M/s. Indian Potash Ltd exemplifies how structured industrial consulting transforms investment intent into actionable implementation readiness. By leveraging NPCS's multi-disciplinary expertise — market research, technical engineering, and financial

modeling — the client received a holistic, investor-grade blueprint that de-risked the entry into citric acid manufacturing.

The approved DPR now serves as the cornerstone document for project financing, regulatory approvals, and phased execution planning — a testament to the depth and quality of NPCS's consulting deliverables.

READY TO BUILD YOUR NEXT INDUSTRIAL PROJECT?

Partner with NPCS to transform your investment idea into a profitable industrial venture.

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