

INDIAN AGRICULTURE AND IFFCO



History of Indian Agriculture (BC)

- Earliest links point to 9000 BC Wheat and Barley cultivation
- 5th millennium BC agricultural communities became widespread.
- 3rd millennium BC.. Indus Valley Civilization
 - > Irrigation developed. Civilization grew as a result.
 - > Cotton, Fruits and Vegetables, Rice.
 - > Sugarcane. Reed that produced honey without bees. (Khand)
- Evidence of animal drawn ploughs in 2500 BC.

History of Indian Agriculture (BC)

“In the later Vedic texts (c. 1000–500 BC), there are repeated references to iron. Cultivation of a wide range of cereals, vegetables, and fruits is described. Meat and milk products were part of the diet; animal husbandry was important. The soil was plowed several times. Seeds were broadcast. Fallowing and a certain sequence of cropping were recommended. Cow dung provided the manure. Irrigation was practiced.”

.....Encyclopedia Britannica

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History of Indian Agriculture (BC)

“India has many huge mountains which abound in fruit-trees of every kind, and many vast plains of great fertility. . . . The greater part of the soil, moreover, is under irrigation, and consequently bears two crops in the course of the year. . . . In addition to cereals, there grows throughout India much millet. . . and much pulse of different sorts, and rice also, and what is called bosporum [Indian millet]. . . . Since there is a double rainfall [i.e., the two monsoons] in the course of each year . . . the inhabitants of India almost always gather in two harvests annually.”

... Magasthenes (Greek Diplomat) (c. 300 BC)—in his book *Indika*

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History of Indian Agriculture (Medieval)

- 1st Century AD..Kallanai Dam built on Kaveri is considered one of the oldest water-regulation structures in the world still in use.
- Spice Trade, cinnamon, black pepper, shipping to Mediterranean started.
- Roman trade with India followed.
- Increased cross border trade brought about diffusion of technologies.
- New irrigation systems brought economic growth and material culture.

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History of Indian Agriculture (Medieval)

“Introduced by the Portuguese cultivation of tobacco spread rapidly. The Malabar Coast was the home of spices, especially black pepper, that had stimulated the first European adventures in the East. ...Tea....was yet undiscovered, though it was growing wild in the hills of Assam. Vegetables were cultivated mainly in the vicinity of towns. New species of fruit, such as the pineapple, papaya and cashew nut, also were introduced by the Portuguese. The quality of mango and citrus fruits was greatly improved.”

.....Encyclopedia Britannica

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History of Indian Agriculture (Pre colonial)

- Diffusion of civilizations and cultures...increased trade.
- Successive dynasties ruled between 10th and 18th century.
- India was witnessing a tremendous advancement in human capital...in Art, Literature, Culture, Music etc.
- Meanwhile Europe witnessed advancement of technology and Industrial revolution.
- Lured by trade in spices and plantation crops, the East India Company came to India.
- The Company eventually came to rule large areas of India.
- In 1858 the British Crown assumed direct control of India.

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History of Indian Agriculture (Pre colonial)

- Prior to 18th century, sugar cane was largely confined to India.
- A few merchants began to trade in sugar.
- Sugar became widely popular in 18th-century Europe.
- Became a human necessity in the 19th century.
- This evolution of taste and demand for sugar as an essential food ingredient unleashed major economic and social changes.
- Tropical and semitropical colonies were sought.

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History of Indian Agriculture (Pre colonial)

Sugarcane plantations, like cotton , became a major driver of large and forced human migrations in 19th century and early 20th century - of people from Africa and from India, both in millions - influencing the ethnic mix, political conflicts and cultural evolution of various Caribbean, South American, Indian Ocean and Pacific island nations.

The history and past accomplishments of Indian agriculture thus influenced, in part, colonialism, slavery and indentured labor practices in the new world.

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Agriculture in British India

- Agriculture was more or less stagnant during this period.
- Emphasis on cash and plantation crop rather than on food grains.
- Focus on trade, decreased production of food crops, mass impoverishment and destitution of farmers.
- Policies more for the Rulers than for the ruled.
- Performance during the 2 wars was dismal.
- During this period while the population increased the food output reduced.

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Evolution of Cooperatives

- Owes origin to agriculture and allied sectors
- Problem of rural indebtedness.
- Coops formed to pool resources and lend...credit societies formed.
- In early 20th century, legal framework for coops was set up.

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Agriculture post independence

- Prior to the mid-1960s India relied on imports and food aid to meet domestic requirements.
- Severe drought in 1965 and 1966 led to reform its agricultural policy,
- India could not rely on foreign aid and foreign imports for food security.
- Food security through Green Revolution.
- Adoption of superior yielding, disease resistant wheat varieties in combination with better farming knowledge to improve productivity.
- These new varieties required large quantities of chemical fertilizers.
- Seeds for IFFCO were sown.

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Evolution of Cooperatives

" But my outlook at present is not the outlook of spreading the cooperative movement gradually..... My outlook is to convulse India with the Cooperative Movement or rather with cooperation to make it, broadly speaking, the basic activity of India, in every village as well as elsewhere; and finally, indeed, to make the cooperative approach the common thinking of India.... "

....J.L. Nehru (First Prime Minister of India)

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Evolution of Cooperatives

- Coops extended to other economic activities as well.
- Post independence, coops dominated the fertilizer distribution business.
- Cooperatives distributed 70 per cent of Indian fertilizer consumption, offered an adequate distribution infrastructure but had no production facilities.
- To bridge the demand supply gap new manufacturing facility was conceived in the cooperative sector that would align with the pre- existing infrastructure.
- IFFCO was born on 3rd November, 1967.

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IFFCO Beginning

Technical assistance from ACDI formerly ICDA.

With their help USD 1 million loan was provided by US Cooperatives.

58 Indian Cooperatives, Government of India and assistance from US And UK marked the humble beginning of IFFCO.

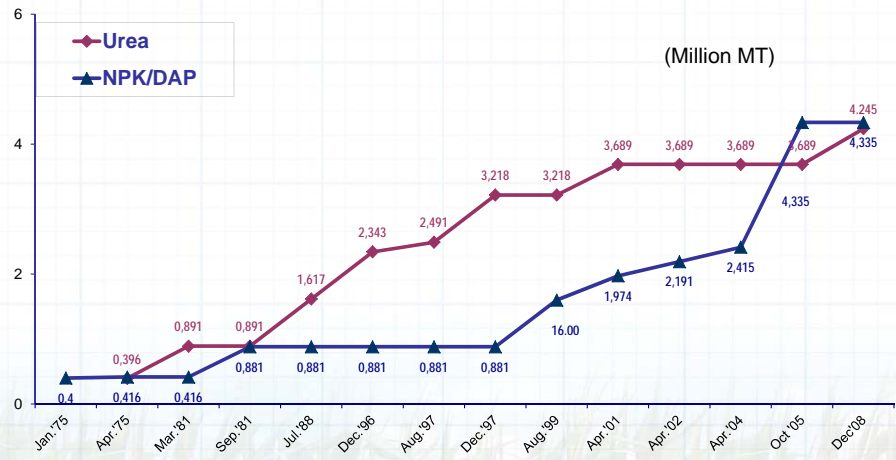
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IFFCO Today

- Largest Producer & Marketeer of **FERTILISERS** in India having installed capacity of more than **8 Million Tonnes**
- Fertilizers marketed through a pan India network of **39,862** member Cooperative Societies
- **Overseas Joint Ventures in Oman, Jordan, Senegal and Canada.**
- **Resource investments in Peru, Australia**
- **Wholly owned by Indian farmers' cooperatives**

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Capacity Growth



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IFFCO India Presence



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IFFCO Global Presence



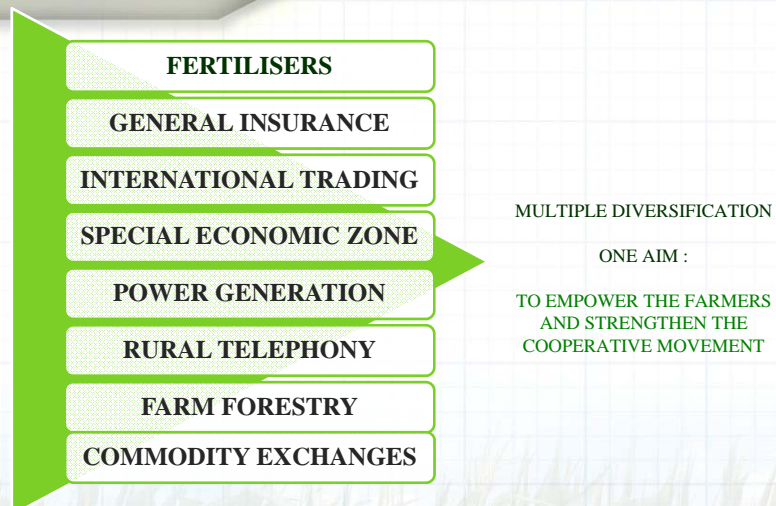
IFFCO Growth Since Inception

Production	21 times
Revenue	270 times
Shareholder Cooperatives	700 times

IFFCO ..Service to Members

- EMPOWERMENT OF MEMBER SOCIETIES & FARMERS
- IMPROVEMENT IN BUSINESS EFFICIENCY
- AGRICULTURAL PRODUCTIVITY
- ENVIRONMENT
- DEPLETING SOIL HEALTH
- ADHERENCE TO COOPERATIVE PRINCIPLES AND SUSTAINABLE DEVELOPMENT

IFFCO Diversification



IFFCO and International Cooperative Development

- In March 1982 IFFCO became a member of ACDI.

“This is one of the most heartening events in my 15 years of working with cooperatives in the developing countries. What a gratifying response to the \$1 million contribution by the U.S. cooperatives and the funding by AID that made possible the development of IFFCO, to have IFFCO now offering to support and assist ACDI in helping to develop and improve cooperatives in other countries.”

...ACDI President Don Thomas

- In 2002-03 IFFCO returned all Government Equity and became fully owned by farmers.

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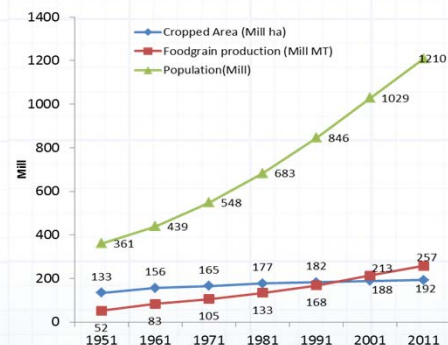
Agriculture Now

Fertilisers have played a major role in agriculture development.

Population 361m to 1210m (over 3 times)
Cropped area 133 to 192 million Ha (44%)

Food grain production was 50 million MT.
Now over 250 million MT. (over 5 times)

India moved from being an importer to exporter of food grains.



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Agriculture Now

INDIA'S POSITION IN WORLD AGRICULTURE

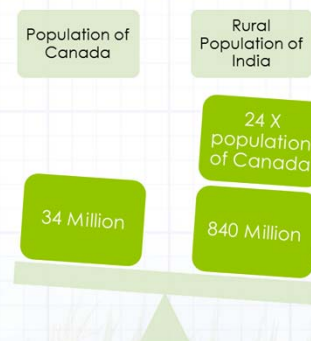
PARAMETER	RANK	FIRST RANK
LAND AREA	7	RUSSIA
ARABLE LAND	2	USA
IRRIGATED LAND	2	CHINA
WHEAT	2	CHINA
RICE	2	CHINA
PULSES	1	INDIA
GROUNDNUTS	2	CHINA
SUGARCANE	2	BRAZIL
JUTE	1	INDIA
TEA	2	CHINA
FRUITS AND VEG	2	CHINA
MILK	1	INDIA

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Agriculture Now

"The soul of India lives in its villages"
- M.K Gandhi

- 600 thousand (0.6 million) villages
- Rural Population of India (as of 2011) **840 million**
- Seven** out of every **ten** Indians live in villages
- Agriculture is the basis of many industries and has many other urban spinoffs.
- Agriculture contributes 20% to country's GDP.
- Half of average Indian's expenditure is on food.



Rural population about 24 times the population of Canada

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Miles to Go

Agriculture in India, largest crops by economic value				
		Average yield, India (2010)	World's most productive Countries (2010)	
Rank	Product	(tonnes per hectare)	(tonnes per hectare)	Country
1	Rice	3.3	10.8	Australia
2	Buffalo milk	1.7*	1.9*	Pakistan
3	Cow milk	1.2*	10.3*	Israel
4	Wheat	2.8	8.9	Netherlands
5	Mangoes	6.3	40.6	Cape Verde
6	Sugar cane	66	125	Peru
7	Bananas	37.8	59.3	Indonesia
8	Cotton	1.6	4.6	Israel
9	Fresh Vegetables	13.4	76.8	USA
10	Potatoes	19.9	44.3	USA

* Per animal per year

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Road Ahead

2nd Green Revolution. Water, Seeds, Infrastructure, Soil nutrients. Balanced Fertiliser use will continue in importance.

Balance between indigenous and imports of fertilisers.

Nitrogen is the most needed fertilizer in India. 90% of N demand is met through Urea.

India is 2nd largest consumer of Urea. Imports 25% of its demand

Fertilisers consumption 141 kg per ha (was 1 kg per ha in early 50s)

Pakistan 240 kg/ ha, Japan 260, Ireland 400+, Malaysia 1000+, Netherland 280+, UK 250+

Cost and availability of Natural Gas in India is constrained. Indian companies going overseas.

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Key Considerations

- Gas, Water and Air....Raw Material for Urea manufacture.
- Gas 50% to 80% of urea cost.
- Abundant and predictable natural gas and water supply are key drivers to locate projects.
- Stable political climate.
- Stable investment climate.
- Business flexibility.
- Options for investors are MENA, Sub Saharan Africa, Russia, China, USA.

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Why Canada

- Of the 10 large producers of Gas, majority add value domestically rather than export raw material.
- Canada exports 40% of its gas. Second only to Norway among the OECD countries.
- Canada is a strategic fertilizer market : strong demand, short supply, abundant and cheap natural gas
- Urea is the number one fertilizer used in Quebec
- 100% of Quebec farmers urea needs are met by imports
- US import more than 7 million tons / year
- Domestic requirement and hence greater social acceptability.

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Why Becancour

- World class industrial park
- Strategic location : port, rail and road connections to major markets
- Availability and access to natural gas
- Large labour pool available
- Hydroelectricity.

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IFFCO Canada's Performance Compared to the Industry

SCENARIOS	ELECTRICITY CONSUMPTION	GHG EMISSIONS*
INDUSTRY STANDARD	30 MW	850 000 t **
IMPACT STUDY	48 MW	678 000 t
IFFCO CANADA' PLANT	65 MW	575 000 t **

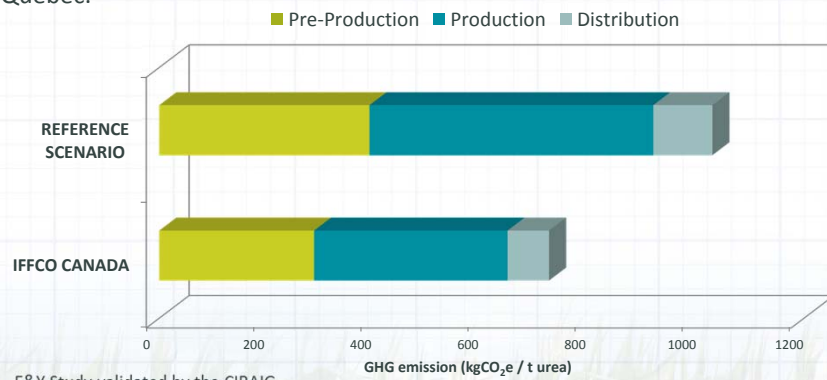
* CO₂ tonnes equivalent

** Estimations

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Comparative Carbon Footprint

GHG emission “from cradle to gate” are approximately **30% lower than the reference scenario**, i.e. importing urea instead of producing it in Quebec.



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Future Plant Perspective



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Project Partners

WHO is IFFCO Canada Enterprise Ltd.?



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The PROJECT - Introduction

The Project essentially consists in setting up a **Urea Fertilizer Complex** containing Ammonia and Urea plants along with all associated Offsite and Utilities necessary to make the plant self supporting in terms of power, water, steam, and other auxiliary systems.

- Urea Fertilizer Complex with capacity: 1.3 – 1.6 Mtpa Granulated Urea.
- Estimated Initial Investment: \$1.6 billion.
- Estimated Annual Spending (Operation): \$ 270 million.
- Site: Bécancour Waterfront Industrial Park, Bécancour, QC.
- First Urea complex in Québec.
- Target Markets: Québec, Canada, USA and World Markets.
- Québec will become an exporter from an importer.
- Plant Construction: 3 years
- Construction commences: 2015
Plant Operation: 2017
- Expected employment during construction: 1000 – 1500
- Expected permanent employment: 250

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The PROJECT - Products

Product	Capacity (tpa)	Uses
Granular Urea	1,300,000 – 1,600,000	Mainly as fertilizer. Secondary use: For Synthetic resins.
Diesel Exhaust Fluid (DEF): (32.5% liq. Urea)	760,000	Additive used for NOx abatement in diesel vehicles.
Ammonium Sulfate	3500 - 4000	Speciality fertilizer.

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Status Update(March 2014)

- Corporate Matters
- Site Studies & Project Reports
- Permitting
- EPC Progress
- Natural Gas Transportation
- Gov't Relations, Communication & CSR

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Social Acceptability

- Local Farmers
- Local Cooperatives
- Jobs
- New expertise in Quebec
- Quebec turns from importer to exporter
- Reduced Carbon Footprint
- Two large cooperatives from two great nations
- Energy for food security

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*"There are people in the world so hungry ,
that God
cannot appear to them except in the form
of bread."*

- Mahatma Gandhi

Let's work together towards Global food security.....

