Role of Irrigation Development in Poverty Alleviation in India

A
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Facts about India

- Geographical Area : 329 mha (2.4 % of World)
- Population : 1.2 billion (17 % of World)
- Ultimate Irrigation Potential: 139.90 mha
- Cultivable Area : 186 mha
  - Under Irrigation : 38% which contributes to 60% of total food production due to high productivity
  - With rise in population and industrialisation the cultivabl area may stabilise at 140-145 mha
- Irrigation Potential : 1951 – 22.60 mha
  : 2007 – 102.77 mha

- At the beginning of new millennium, 260 million people in India were below poverty line
- Poverty eradication is one of the major objectives of development planning process in India

Water Resources Availability in India

- Average Annual Water Resources Potential : 1869 BCM
- Utlilizable Water : 690 BCM (considering hydrological, terrain and geological constraints)
- Average replenishable ground water : 433 BCM
- Total utilisable Water Resources : 1123 BCM
  (About 28% of annual precipitation received)
- Water availability : Very skewed
- Aerial distribution of Water Resources is highly uneven

India's Population Growth and Food Security

Considering projected population of 1.6 billion in 2050, the food production is required to be doubled to 420 million tonnes from the present level of 210 million tonnes, to ensure desired level of food security

India's Irrigation Development and Agricultural GDP Growth

- GDP (Agriculture Sector)

  1950-51 : USD 1.1 billion (₹ 5080 cr.)
  2008-09 : USD 1062 billion (₹ 49,33,183 cr.)

- Growth Rate of GDP (Agriculture & Allied Sectors)

  1950-51 : 3.26

  2008-09 : 10.11

Irrigation Development and GDP Growth in Agriculture Sector

- Gross Domestic Product (GDP)
  - 1950-51 : Rs. 5080 crore
  - 2008-09 : Rs. 4933183 crore

- GDP Growth Rate
  - 1950-51 : 3.26
  - 2008-09 : 10.11

Micro-Irrigation Development in India

- Management of WR Development in a sustainable manner is the need of the day to :
  - » economise water in agriculture
  - » bring more area under cultivation
  - » reduce irrigation cost
  - » increase yield.
- The objective can be achieved through advanced micro-irrigation methods (drip and sprinkler)
- Area under micro-irrigation : 69.5 mha
- India provides subsidy for sprinkler irrigation through various programmes
- India also making efforts for popularisation and expansion of sprinkler irrigation through Farmer's Participatory Action Research Programme
- Micro-irrigation increases productivity per drop pf water

Irrigation Development and Poverty Alleviation

- Agriculture Employment Growth Rate
  - 1993-94 to 1999-2000 : - 0.03
  - 1993 – 94 to 2004-05 : + 0.40
- Overall Poverty Ratio
  - 1973-74 : 54.9%
  - 2004-05 : 21.8%
- Poor in Rural Area
  - 1973-74 : 261 million
  - 2004-05 : 170.3 million

✓ These are largely attributable to irrigation development

Case Study-1: Indira Gandhi Nahar Project, Rajastahan

Rajasthan

- Located : in North-West of India
- Population : 56.1 million (5.49 % of India's)
- Total land area : 34.23 mha
- Climate : Driest in the country
- Average annual rainfall ~ 500 mm
- Water Availability : Not assured, frequently affected by famine.
- Cultivable area : 27.65 mha (only 3.72 with assured irrigation facilities)
- Ultimate irrigation Potential: 5.15 mha

Case Study-1: Indira Gandhi Nahar Project, Rajastahan

Indira Gandhi Nahar Canal

- Objective: Making water available to largest possible area and to arrest spread of desert
- One of the most gigantic projects in the World
- Aims at de-desertification and transforming desert waste land into agriculturally productive area
- Planned CCA: 1.88 mha
- Being executed in two stages

Case Study-1: Indira Gandhi Nahar Project, Rajastahan

Stage-I : Started in 1958 and completed in 1992

- Feeder canal of 204 km length
- Main Canal of 189 km
- 3075 km long distributaries
- Culturable Command Area (CCA) : 0.56 mha
- Estimated Cost : USD 73.86 million (₹ 343.oo crore)

Case Study-1: Indira Gandhi Nahar Project, Rajastahan

Stage-II

- Started in 1971-72 and likely to be completed by 2015-16
- Feeder Canal of 256 length
- 5610 km long distributaries
- CCA: 1.36 mha
- Estimated Cost: USD 1598 million (₹ 7416.26 crore)

Case Study-1: Indira Gandhi Nahar Project, Rajastahan

Impacts

- Major role in agriculture production
- Provides agriculture produce worth UDS 377.4 million (₹ 1750 crore) annually
- Benefited 17.5 million people covering 8 districts and 3461 villages
- Food grain, oil seed and cotton production increased from 4.78 million tonne in 1987 to 10.64 present
- Besides Irrigation, the project provides drinking water in seven districts of most arid zone of Rajasthan.

Case Study-2: Maan and Jobat Irrigation Projects Madhya Pradesh

Madhya Pradesh

- Ranks second in terms of area and seventh in population in India
- Primarily an agricultural Stte
- 73% of population is rural which depend on agriculture
- Agriculture plays important role in State's economy and social tandem
- 78% of States' work force is directly engaged in agriculture

Case Study-2: Maan and Jobat Irrigation Projects Madhya Pradesh

- Maan Participatory Irrigation Management Project
  - Designed Irrigable Area: 15000 ha
  - Aims to benefit people and agriculture in 53 villages
  - About 7910 rural families to get benefited
- Jobat Participatory Irrigation Management Project
  - Designed Irrigable Area: 9848 ha
  - Aims to benefit people and agriculture in 24 villages
  - About 2450 rural families to get benefited

Case Study-2: Maan and Jobat Irrigation Projects Madhya Pradesh

- Socio-economic Transformation
  - Green revolution in tibal dominated area of madhya Pradesh
  - Lush green hillocks visible around dam and canal network
  - Tribes earlier reeling under great economic hardship now grow two crops a year
  - Irrigation provided even in ridge areas where there was no water available earlier
  - Farmers feeling out of clutches of poverty
  - Agriculture production : 2004-05 : 36154 tonnes
  - : 2009-10 : 67735 tonnes
  - Positive change exhibited in social behaviour

Case Study-3: Upper Kolab Multipurpose Project, Orissa

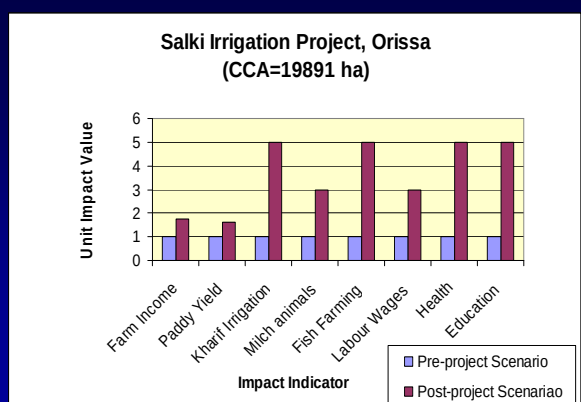
- The Project in brief :
  - Located on river Kolab in Koraput-Bolangir-Kalandi region of Orissa, one of the historically known poorest regions of India.
  - Command area : 47985 ha consisting of more then 40% of the tribal population of the State
  - Dam : 55 m high, straight masonary gravity dam
  - Hydropower generation : 111 MW of firm hydropower
  - Estimated Cost : USD 3.47 million (₹ 16.08 crore)
  - Completed in 1990

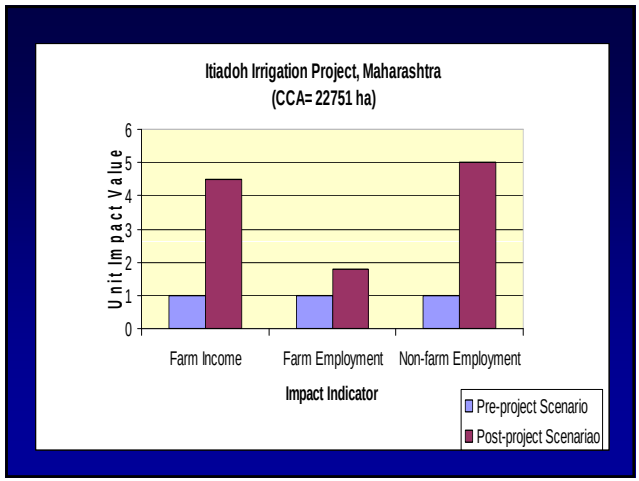
Case Study-3: Upper Kolab Multipurpose Project, Orissa

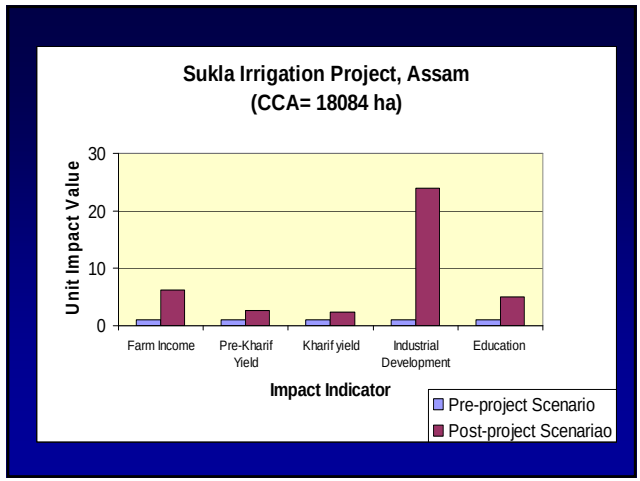
- Benefits :
  - Planted acreage increased by three fold
  - Substantial increase in crop yield, paddy yield increased by six times.
  - Multiple crops started growing, commercial crops of sugarcane, potato and vegetables added and specialised crops like strawberry introduced.
  - Greater farm opportunities created even in un-irrigated region.

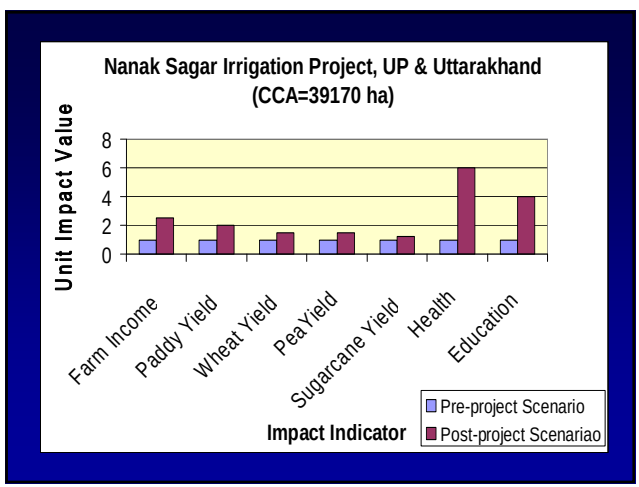
Case Study-3: Upper Kolab Multipurpose Project, Orissa

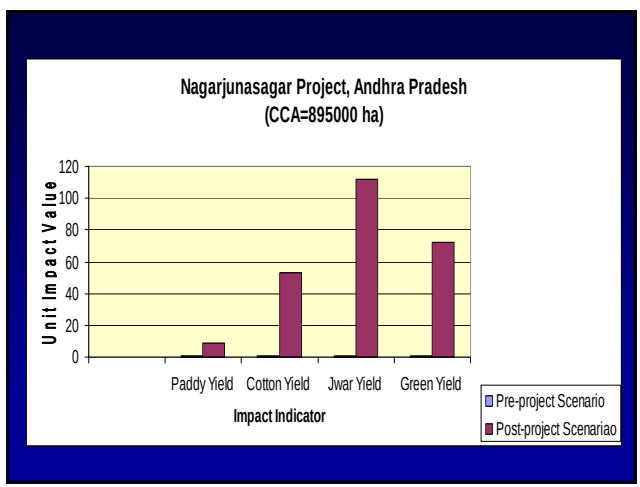
- Benefits :
  - Spurt in construction of greater pakka houses indicates well being of the poor as impact of irrigation development.
  - Irrigation development has resulted in increased agricultural production, increased per capita income, more education and employment opportunities.
  - Benefits can be further maximised by providing incentives for industries, command area development programmes, water use policies and by encouraging micro irrigation.

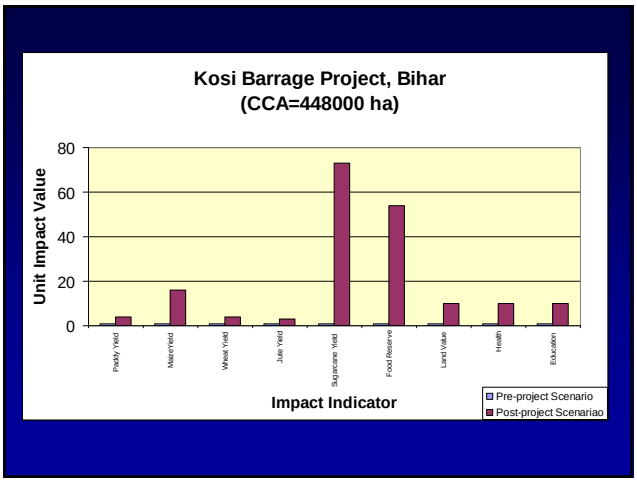


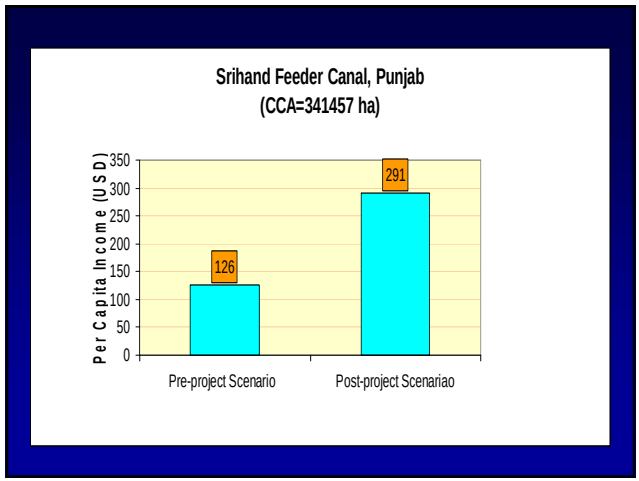

Itiadoh Irrigation Project, Maharashtra
(CCA= 22751 ha)
Unit Impact Value
0
1
2
3
4
5
6
Farm Income
Farm Employment
Non-farm Employment
Impact Indicator
Pre-project Scenario
Post-project Scenariao

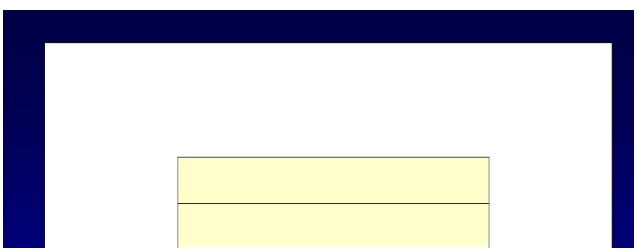

Sukla Irrigation Project, Assam
(CCA= 18084 ha)
Unit Impact Value
0
10
20
30
Farm Income
Pre-Kharif Yield
Kharif yield
Industrial Development
Education
Impact Indicator
Pre-project Scenario
Post-project Scenariao


Nanak Sagar Irrigation Project, UP & Uttarakhand
(CCA=39170 ha)
Unit Impact Value
0
2
4
6
8
Farm Income
Paddy Yield
Wheat Yield
Pea Yield
Sugarcane Yield
Health
Education
Impact Indicator
Pre-project Scenario
Post-project Scenariao


Nagarjunasagar Project, Andhra Pradesh
(CCA=895000 ha)
Unit Impact Value
0
20
40
60
80
100
120
Paddy Yield
Cotton Yield
Jwar Yield
Green Yield
Impact Indicator
Pre-project Scenario
Post-project Scenariao


Kosi Barrage Project, Bihar
(CCA=448000 ha)
Unit Impact Value
80
60
40
20
0
Paddy Yield
Maize Yield
Wheat Yield
Jute Yield
Sugarcane Yield
Food Reserve
Land Value
Health
Education
Impact Indicator
Pre-project Scenario
Post-project Scenariao


Srihand Feeder Canal, Punjab
(CCA=341457 ha)
Per Capita Income (USD)
350
300
250
200
150
100
50
0
126
291
Pre-project Scenario
Post-project Scenariao



Conclusion

- Increased on-farm and off-farm income and spurt in value of land in the concerned areas, increased crop yield and multiple crop sowing, enhanced education level and better standards of living are suggestive of substantial impact of irrigation development on poverty alleviation in India.
- In India, the irrigation development has, in fact, been a pro-poor strategy to alleviate the severity and gravity of the poverty.
- The Government of India has launched many programmes in Agriculture Sector with special emphasis on poverty alleviation.
- With better irrigation water management and technological developments, the agricultural activities in rural and other areas are expected to increase further which would result in more on-farm and off-farm incomes and would further alleviate poverty.

Thank You