

ECONOMICS, ENERGY AND FOOD SECURITY FOR THE WORLD

by

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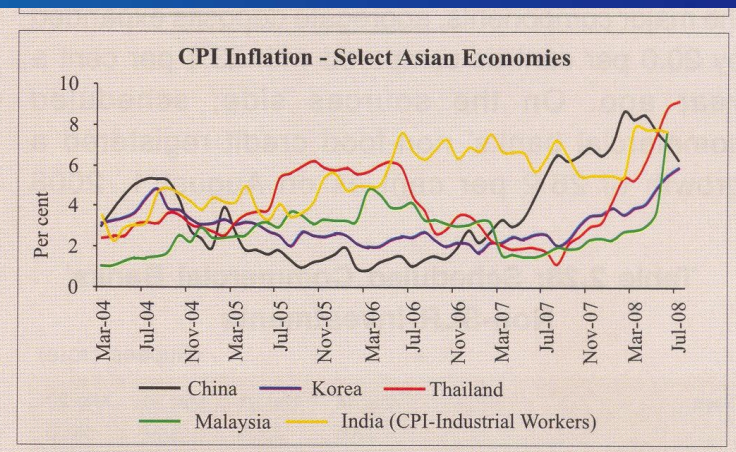
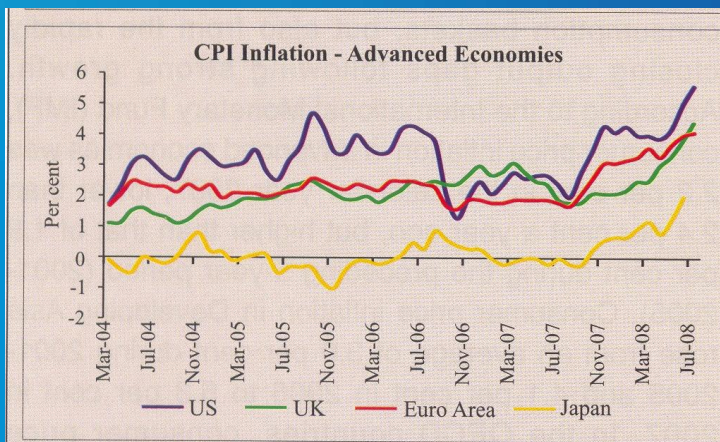
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Lecture delivered at WAAS, Hyderabad

1. Soaring Inflation particularly in Developing Countries.
2. Percent Inflation in Developed Countries US (2.2), UK (3.1), Japan (2.6), Canada (2.7), Australia (3.9).
3. Percent inflation in developing nations - India (9.0), Brazil (5.4), China (11.9), S. Africa (5.1), Indonesia (6.3).
4. Inflation primarily in food articles, poor productivity, escalating oil price, poor rural infrastructure affecting the poorer sections of society.



CAUSES OF INFLATION

1. Oil Price increase hampering growth in energy production, Infrastructure which in turn affects industrial and agricultural growth.
2. While GDP growth in India is 9% per year, contribution of agriculture has diminished. Agricultural Contribution is 17%, Industry (19%) and Services (64%). In USA, it is 5%, 20% & 75%.
3. Unlike in USA where only 2% people are engaged in Agriculture, 60% of people in India are dependant on Agriculture.
4. Poor agricultural productivity (1.0 – 2.5 t/ha.) has major effect on rural population in addition to affecting food security. Population growth (2.5% / year) offsets more than Agri growth (<2% / year).

RURAL ECONOMICS

1. GDP growth has minimal effect on rural population – rapid increase in inequity (factor of 1.5) between the rich and poor, who are most vulnerable.
2. Large scale unemployment and under-employment in rural areas.
3. Need to establish agro-based industries in rural areas for providing gainful employment. This requires substantial increase in energy and infrastructure.
4. Limited agricultural land cannot support such large population – large scale deployment of rural people to urban – semi-urban areas needed.
5. Massive investment needed for providing vocational training to enable rural people to get gainful employment.

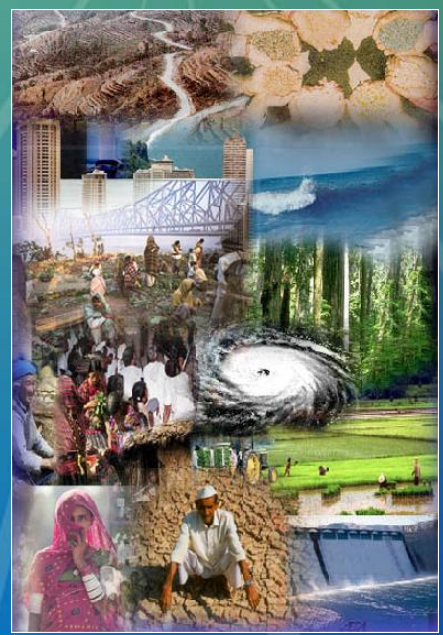
AGRICULTURAL PRODUCTIVITY

	Developed Countries	Developing Countries	Asia	Latin America	Africa
Population 2005 (Billions)	1.0	5.4	3.6	0.6	0.8
Population 2020 (Billions)	1.1	6.8	4.5	0.8	1.2
Population 2050 (Billions)	1.2	8.4	5.4	1.0	1.8
Food Productivity 2005 (T/ha.)	4.6	2.8	2.4	3.2	1.1
Required Productivity 2020 (Ton / ha.)	--	4.0	4.2	3.6	3.4
Required Productivity 2050 (Ton / ha.)	--	4.6	4.8	4.0	4.8

FOOD SECURITY

1. Poor Food Productivity 1.7 ton / ha. Average in India.
2. Primary cause is negative effect of green Revolution.
3. Food security requires increased productivity to ~ 4.5 t/ha. in developing countries by 2050.
4. New Ever Green Revolution requires:

Grid-based precision farming by combining space technology and bio-technological inputs.
5. Massive investment in Energy / Infrastructure needed.
6. Needs better access to marketing, development of agro-based industries.
7. India – started with Rural Kiosks (Gyandoot, Tarhat, Drishti) and now Village Resource Centers.
8. Use of space technology for better meteorological forecasting and mitigation of disasters (drought, meteorological disasters).



AGRICULTURE & SOIL

- Crop Acreage & Production Estimation
- Soil & Land Degradation Mapping
- Watershed Development
- Horticulture Mission for North-East



FOREST, ENVIRONMENT, BIO

- Forest Cover & Type Mapping
- Forest Fire and Risk Mapping
- Biodiversity Characterisation
- Environmental Impact Studies



WATER

- Potential Drinking Water Zones
- Command Area Management
- Reservoir Sedimentation



GEOLOGY & MINERALS

- Vasundara
- GEOISMM
- Coal Fire studies
- Mineral Exploration

DISASTER SUPPORT

- Flood Damage Assessment
- Drought Monitoring
- Land Slide Hazard Zonation



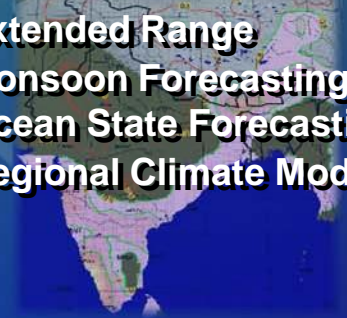
LAND

- Landuse/Land Cover Mapping
- Wasteland Mapping
- Urban Sprawl Studies
- Large Scale Mapping



WEATHER & CLIMATE

- Extended Range Monsoon Forecasting
- Ocean State Forecasting
- Regional Climate Model



OCEAN

- Potential Fishing Zone (PFZ)
- Coastal Zone Mapping



PLANNING COMMISSION

- Agro-Climatic Zone Based Planning (Land Use / Land Cover)
- Agroclimatic Planning Info. Bank-APIB

IMSD - ACTION PLANS

Surface Water Harvesting, Ground Water
Exploration and Recharge,
Soil Conservation, Alternate Land use

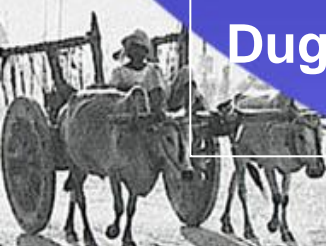
Water Resources Development

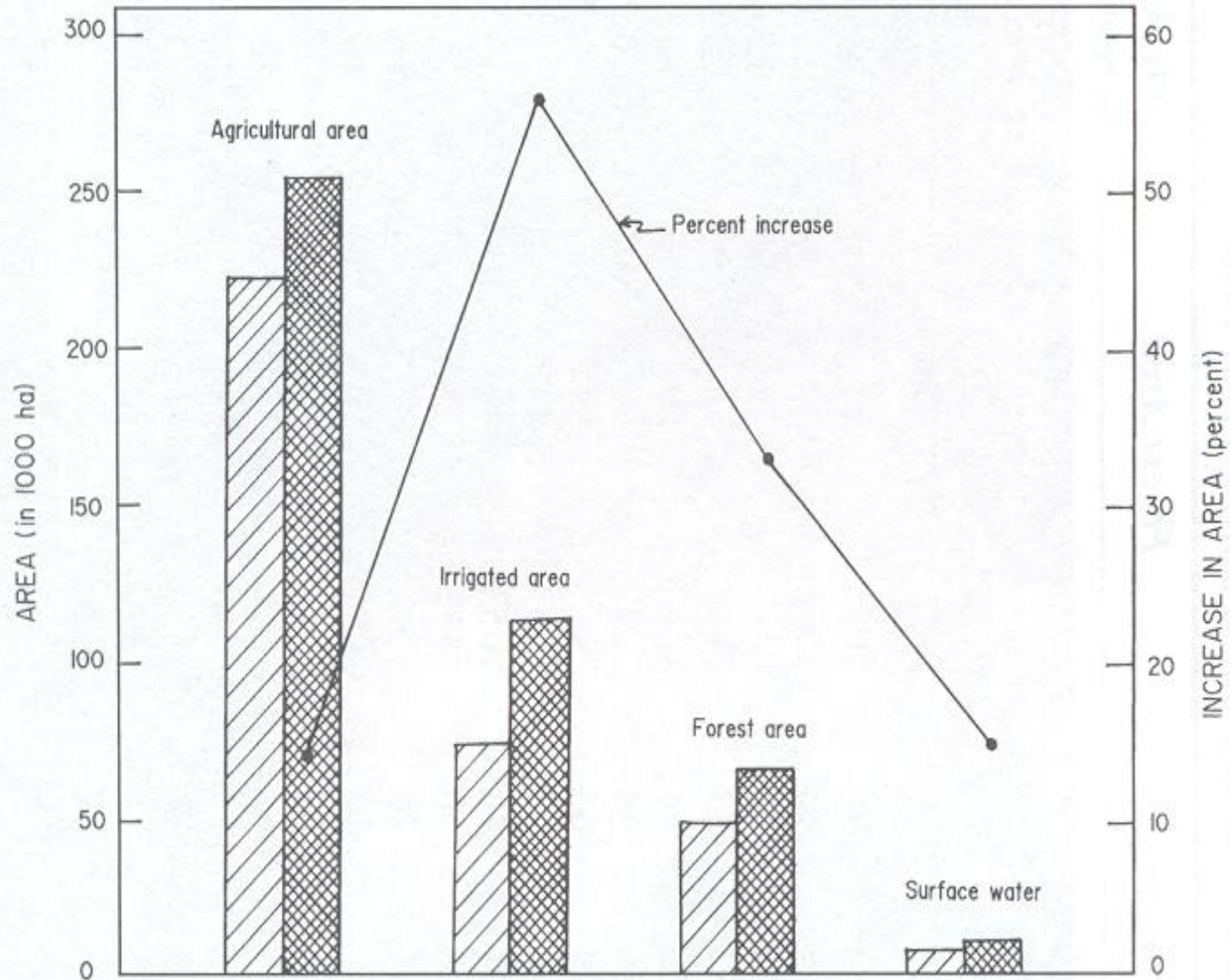
Check Dams
Percolation Tanks
Nala Bunds
Dykes (Bandhara)
Farm Ponds
Vegetative Bunds
Gully Plugs
Tank Desiltation
Dug/Tube Wells



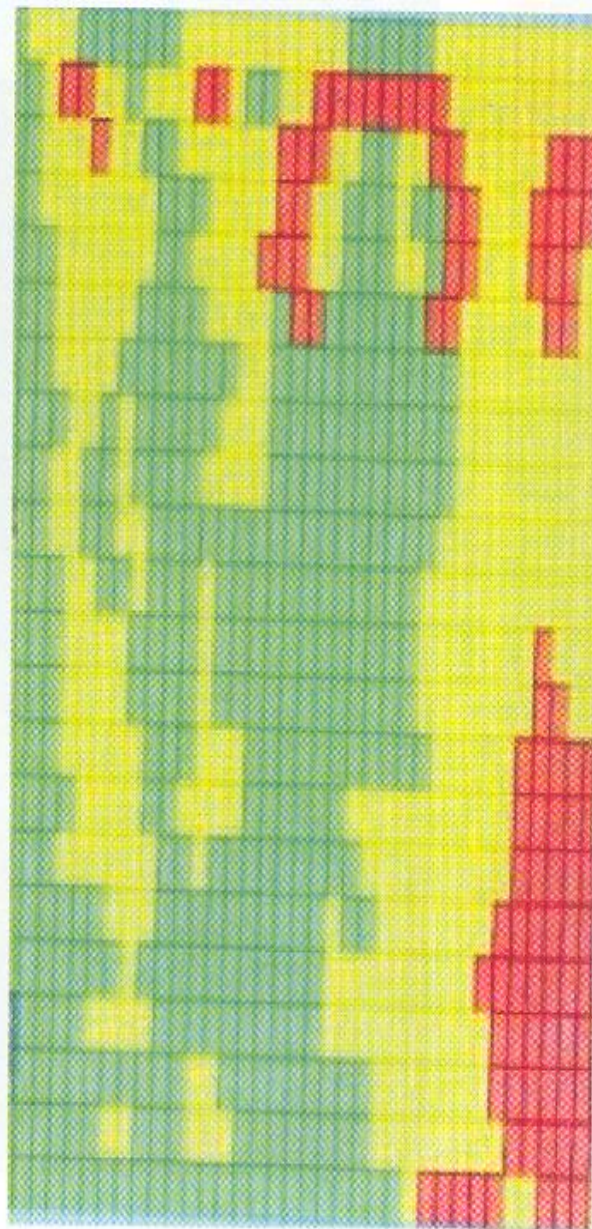
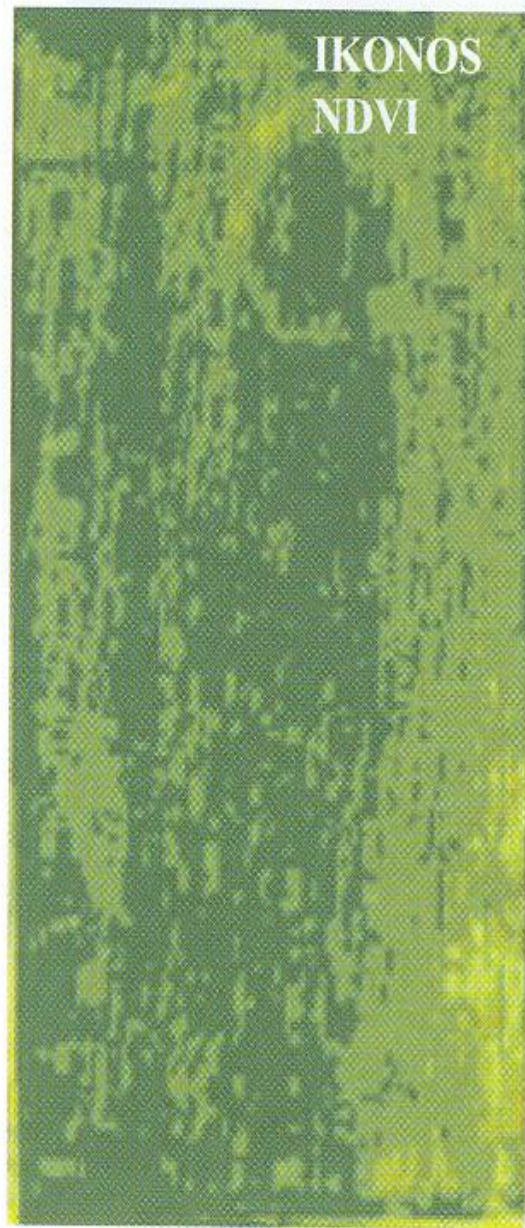
Land Resources Development

Agro-horticulture
Agro-forestry
Silvipasture
Double cropping
Intensive Agriculture
Afforestation
Forest Enrichment
Pasture Development
Fuel/Fodder Plantation





Increase in land and water resources in 20 watersheds as a result of IMSD strategy implementation (1988-1996).



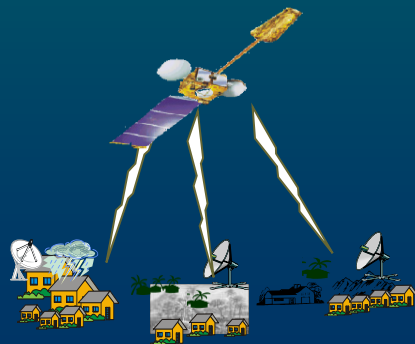
Red = 210 kg/ha N
Yellow = 180 kg/ha N
Green = 130 kg/ha N

IKONOS-derived NDVI on the left and the zone map on the right, with nitrogen application recommendations.

VILLAGE RESOURCE CENTRES (VRC) OUTREACH TO GRASSROOTS

Components

- Digital Connectivity
- EO based Info.
- Advisory on Agri, Fisheries, Livelihood support, ...
- Tele-Education, Healthcare, ..
- Disaster Management



NR Database & Query Shell in local language

Multilingual interface

PRA Summary

Name Of The Farmer : **செந்திரன்**

Patta Number : **531**

Survey Number : **177**

Sub Number : **3**

Wet Land : **7.5**

Dry Land :

CURRENT LANDUSE

FALLOW

SOIL CHARACTERISTICS

Soils : **PROSODI**

Texture : **SANDY CLAY LOAM**

Structure : **HEAVILY STRUCTURE**

ALTERNATIVE CROPS

With Less Water Available

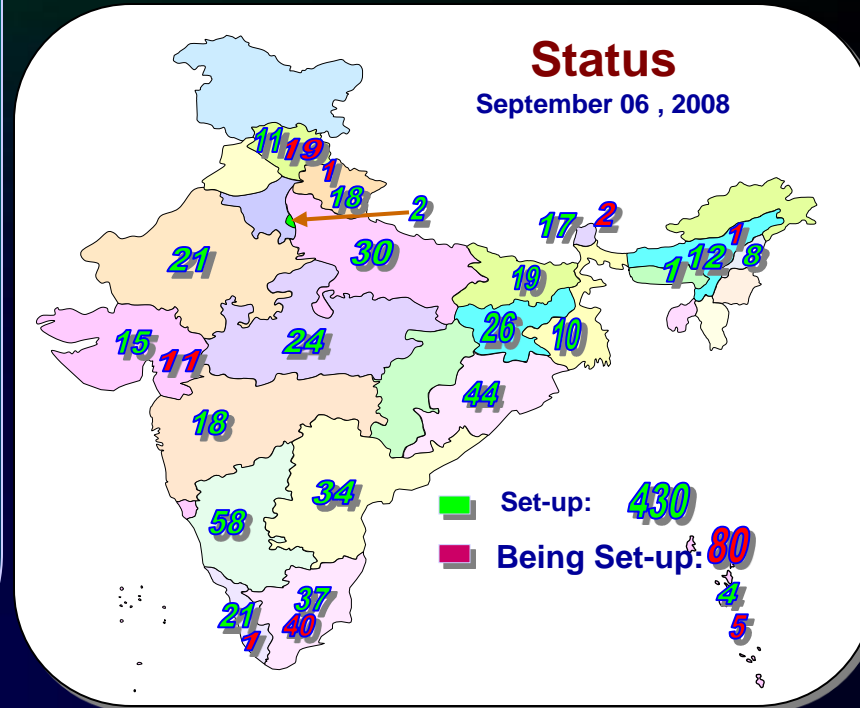
With Less Water Available

WATER RESOURCE

Water Source

Quality of Tank

Water available



ENERGY SECURITY

- Energy Security for Industrial Expansion, Agricultural and Infrastructure Growth. India's high GDP growth is mainly due to services sector – manufacturing sector growth needs increased energy.
- Per capita energy usage (Kg oil equi), US (7920), Europe (3990) as against China (1240), India (530), Developing countries (1070).
- Energy Deficit 10% on an average and 15–18% at peak in India.
160,000 MW installed capacity of which oil / coal 65%,
Hydro 25%, Solar 7.5% and Nuclear 2.5%.
- Global warming scenario 0.75°C Increase in the last 150 years.
- CO_2 Emission Increase from 280 PPM to 380 PPM.
- Global Warming effect – Glacier Melting, Arctic ice melting, Sea Level Rise (3mm/yr),
Inundation of low lying coastal areas, changing weather pattern, Increase in extreme meteorological events.
- IPCC Panel Prediction by 2100 Temp. rise of 3.4°C (2.0 – 5.4°C)
Sea Level rise .37m (0.23 – 0.51)

GLOBAL WARMING POLITICS

- Rich countries contribute most on per-capita basis US (22t), Australia (19t), European Countries (11t), 1 billion people (16%) account for almost 50% of CO₂ Emission as against 5 billion people in developing countries contributing 50%.
- Kyoto Protocol specifically recommends – rich countries must reduce their emission to make space for poor to grow. However, US / Australia have increased CO₂ Emission by 19% in the last decade.
- Transport contributes 15% of total CO₂ Emission.
US alone contributes 36% of the above.
- Poor countries cannot survive with their population predicted to increase from the present 5 billion to almost 9 billion by 2050.

GLOBAL WARMING SOLUTION

- While IPCC report is broadly correct, detailed predictions at national / sub-national level have large uncertainties. Additional caution for global warming (effect of cosmic rays through low level cloud formation) can also alter estimated effect of CO₂ emission.
- Enormous political pressure particularly targeting India and China having over 30% of global population.
- Use of alternate clean energy sources, prohibitively expensive for developing countries. Even nuclear energy capital cost is 50% more than coal (\$1.6 million / mega watt as against \$1.0 million for coal).
- Carbon credits trading is a total failure besides being demeaning.

- One possible solution is instead of carbon credits trading, you fix CO₂ emission limit for developed / developing countries and impose hefty fine on those who exceed their limit.
- The fund collected from fines be kept under a separate “Global Warming Fund”, which is to be utilised to support developing countries in building clean energy systems. The fund distribution to be based on the population and GDP of each country.
- The biggest difficulty is in making any developed country to accept any such limit and abide by the rule.

Ethical policy, be it between individuals, societies or nations, requires us to inculcate a little bit of imagination, reverence and respect for other's way of thinking, tolerance to others ideas and practices, concern for the well-being of the poor, continued effort to improve the quality of life of all people, reverence for nature, fusion of material and spiritual values and deep concern for the future generation who will inherit the earth.

The day that all men and women, all societies and nations dedicate themselves to the service of Daridra Narayana (God manifested in the hungry, destitute millions) to the upliftment and edification, we will have established true harmony in this divided world.

“Swami Vivekananda”

Thank You