



भारतीय कृषि एवं खाद्य परिषद्
INDIAN COUNCIL OF FOOD AND AGRICULTURE

ALL INDIA

Agri Startups
CONVENTION 2018



and
Agri Startup Awards 2018

February 21-22, 2018 | Constitution Club | New Delhi

Session 1: Agri Startups Potential and National Outlook

Art and Science of Innovating in Agri Value Chain

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ARS (Retd.) Ex-ICAR

Agri Startup Ecosystem is evolving. Get up fast! ...

Order of Presentation

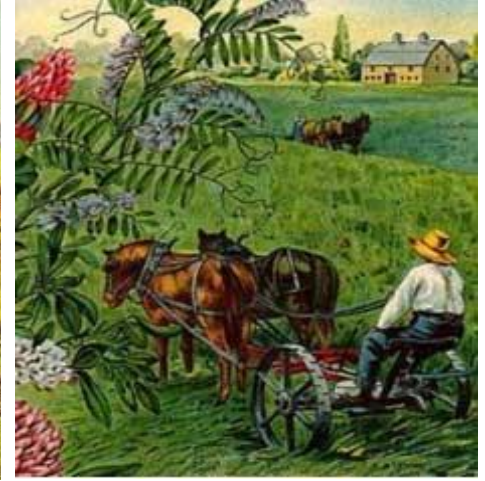
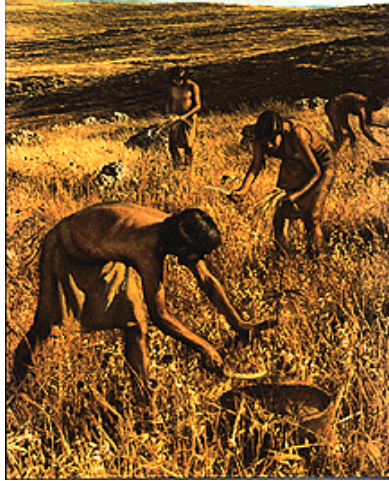
1. **Brief Historical Account of Agriculture**
2. **Commentary on Agri-business and Startups**
3. **Current Govt Initiatives in present context**

Prologue

 **Scientists are responsible for the foreseeable consequences of their research whether good or bad**

Opinion: The Dark Side of Science; The Scientist November 16, 2011

AGRICULTURE IS THE SOURCE OF PERPETUAL CREATION ON WHICH CIVILIZATION DEPENDS. --- M. S. Randhawa



Isn't it better to look out for 'Both sides of the coin'



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Despite many accomplishments of humankind, we owe our existence to a six-inch layer of top soil and the fact that it rains

--- Confucius (551-479 BC)

OXFORD INDIA PAPERBACKS

IRFAN HABIB



The Agrarian System
of Mughal India
1556–1707

SECOND • REVISED • EDITION

Some take-home messages from history

- 1. MAN CANNOT LIVE WITHOUT BREAD,**
but he does not live by bread alone
 - More people have died for the sake of their faith and ideas than for bread
- 2. POLITICAL HISTORY CAN'T BE IGNORED IN A HISTORY OF AGRICULTURE**
 - There were broad-minded rulers with sympathy for the tillers of the soil; their economy improved and people were happy.
- 3. INTERDEPENDENCE FOR AGRICULTURE IS A MUST**
 - Indians domesticated 2 dozen odd crops and British and Moghuls introduced many new vegetable and fruit crops that are integral now

- M. S. Randhawa (1980) A History of Agriculture in India

MECHANIZATION & STORAGE

Tractor cultivation in U.P. and Panjab: 1914: **S. Jogendra Singh**



Gola or Gol Ghar for Grains

a domed **granary** built in Patna by **Captain John Garstin**, in 1786 at the order of Warren Hastings, later the first Governor-General of India; following severe drought and acute famine from 1770 to 1780.

WATER: A Befitting Tribute

Lift Irrigation for irrigating the high-lying lands in Panjab: **Sir Ganga Ram**



At Pentapadu in West Godavari, Andhra Pradesh, on 15th May, farmers adorn the statue of **Sir Arthur Cotton** (who conceived and executed the schemes of Cauvery, the Godavari and the Krishna deltas 160 years hence) with a garland of paddy panicles. —Photo: A.V.G. Prasad

Agriculture History

- ❖ **Domestication** : Era of Settlement
- ❖ **Intensification** : Era of Renaissance
: Era of Green Revolution
- ❖ **Diversification** : Contemporary Era
- ❖ **Value Addition** : Recent Era/Modern Biotech Era

Drivers of Agri Intensification & Development

INNOVATION

- **Discovery and Development/ Adoption/ Diffusion**

TECHNOLOGY

- **Empirical/ Conventional / Industrial / Genetic Modification / Sensors and Robotics**

INTELLECTUAL PROPERTY RIGHTS

- **Pre Uruguay Round / Post WTO**

Patented Technology that Revolutionized Agriculture through commercial realm in USA and Europe

INVENTION	INVENTOR	YEAR
Seed Dril (Horse drawn) For sowing in Rows	Jethro Tull	1701
Spinning Jenny	James Hargreaves	1770
Cotton Gin	Eli Whitney	1793/1807
Reaper	Cyrus McCormick	1831
Barbed Wire	Joseph Glidden	1873
Peanut Agricultural Science For digging & cleaning of soil	George Washington Carver	1896



EXCLUSIVE USE OF SUCH TECHNOLOGY LED TO SOCIETAL BENEFITS AND ECONOMIC DEVELOPMENT

Generic Technology also led to Revolution in Agriculture through Public Good push in **DEVELOPING COUNTRIES**

- **Semi-dwarf varieties of wheat and rice brought green revolution**
- **Hybrids in maize, pearl millet, vegetables brought radical increases in production**
- **Hybrid rice development in China brought in yet another way rice crop can out-yield itself**

- **LED TO MANY AWARDS AND REWARDS, AND OF COURSE SOCIETAL BENEFITS BUT NOT AS MUCH ECONOMIC DEVELOPMENT**

❖ **Nobel Peace Prize; World Food Prizes, etc.**

Innovations in agri-production realm since domestication

1. SEED CULTURES

- Cultivation of **GRAINS & VEGETABLES**; **FRUIT** crops came much later

2. IRRIGATION

3. TILLAGE SYSTEM

- Domestication of Animals

4. SELECTION OF VARIETIES

5. CROPPING SEASONS – wet and dry seasons; **Intensive cropping**

- Vegetables and Paddy in lowlands

6. ADDRESSING PEST PROBLEMS; weeds, diseases, insect pests

7. POST-HARVEST processing and storage

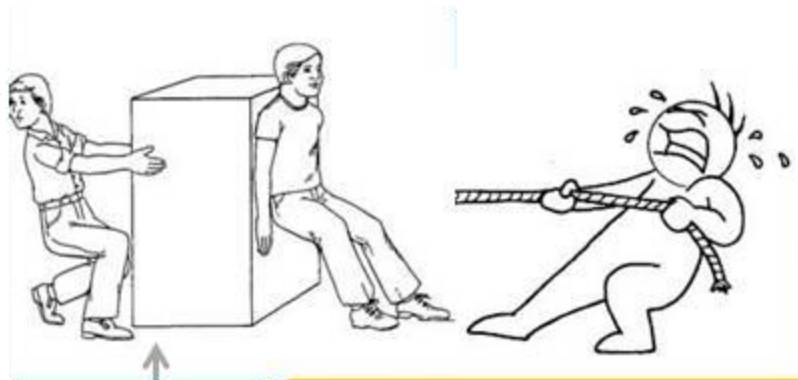
8. FISHING AND AQUACULTURE

- Early fisherman probably practiced first agriculture

Enterprising in agriculture has vast scope

Primary products	Grains ; Fruits & Vegetables ; Mushrooms ; Condiments & Spices ; Flowers & Ornamentals ; Fodder
Industrial Derivatives	Oils, Cake & Meal ; Sugar, Tea, Coffee, Tobacco ; Fibre: Cotton, Jute, Coir ; Food products/Value added Food products ; Breakfast/ processed/ canned foods (Baby foods ; Aromatic oils ; Flavours) ; Feed Mix ; Nutraceuticals ; Plant based medicines
Agricultural inputs	Seeds & other Planting Material ; Farm Power & Machinery ; Tools & Implements ; Agril chemicals (Fertilizers, growth promoters, pesticides ; weedicides) ; Bio agents ; Hi-Tech nursery ; Sprinkler/ Drip irrigation equipment
Post Harvest Operations	Cold storage; Processing & Value addition ----- Packaging, storage, transportation (secondary operations)
Agribusiness	Commodities, Goods and Services

Technology Push ↔ Market Pull

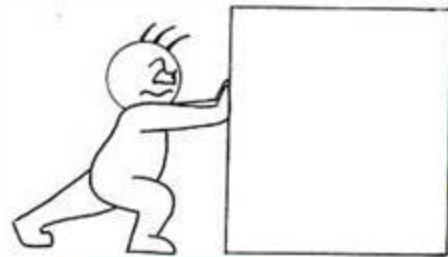


● **Market**

● **Innovation**

**User
satisfaction
oriented**

**Product
specification
standards
& quality
oriented**

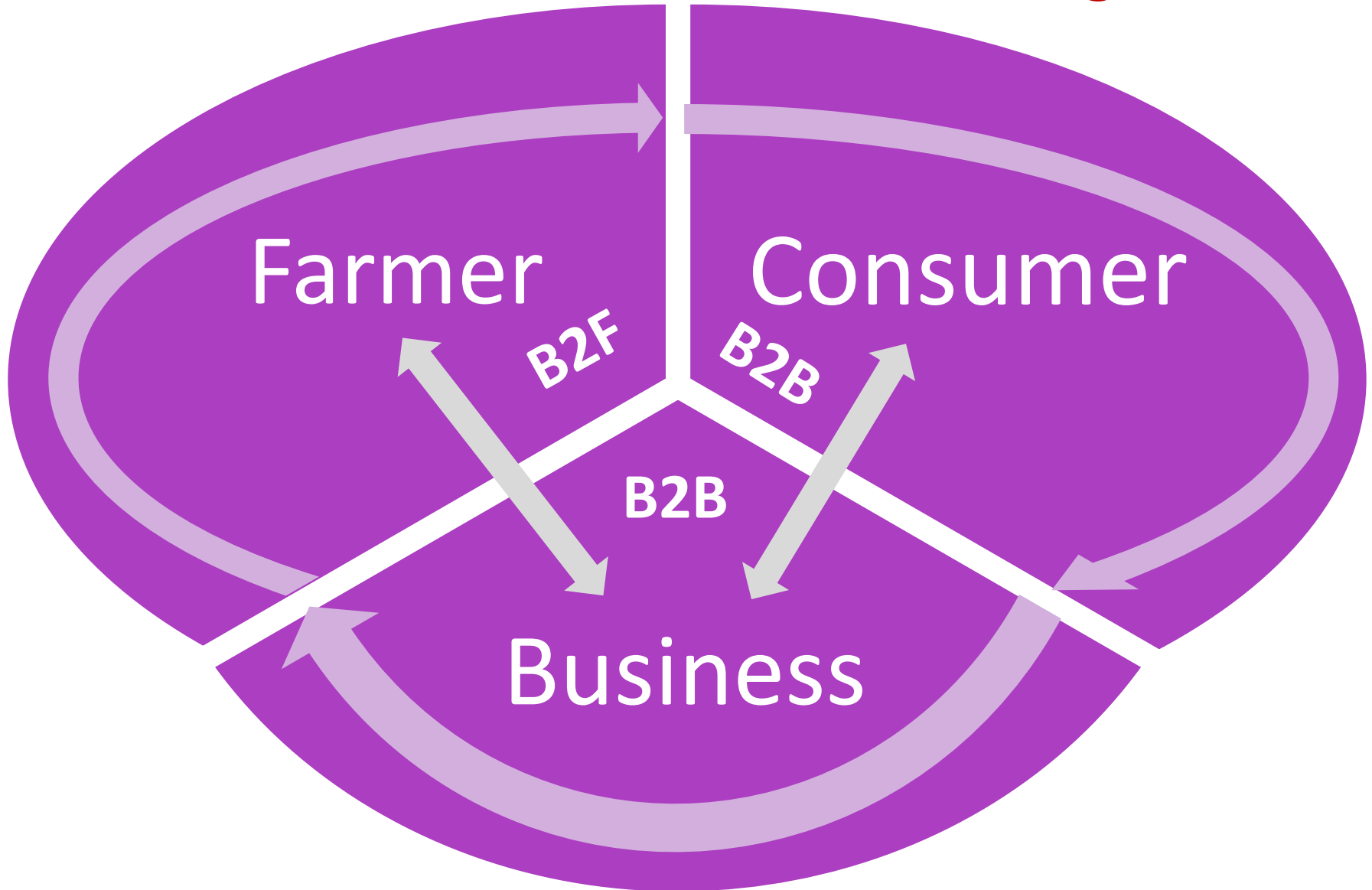


● **Technology**

**Problem-solving
target oriented**



Innovate for win-win networking



⇒⇒ Startups ⇒ Companies ⇒ distributors ⇒ retailers ⇒ farmers ⇒⇒

25 most innovative ag-tech startups @ US\$ 40k mn - Forbes

1. AgCode

Vineyard management

2. AGER point

Nut & Citrus orchard management

3. Arvegenix

Cash crop between corn & soybean

4. BluWrap

Patented oxygen management technique extends shelf life of fresh protein

5. Bovecontrol

Livestock manager using cloud technology

6. BrightFarms

Building and operating greenhouses

7. Clear Labs

Database of world's food supply retailers - suppliers – healthy food focus

8. CropX

Cloud-based software & sensors to boost yield while saving water and energy

9. Farmer's Edge

Hardware + software + satellite imagery + precision tech to manage land variability

10. Farmer's Business Network

open data support to small farms to let them compete with large operations



Forbes list of most innovative ag-tech startups – contd.

FarmLead

FoodLogiq

S4

Sample6

Full Harvest

Spensa Technologies

Granular

Strider

mOasis

Mavrx

SWIIM

Produce Pay

Terviva

RipeIO

Trace Genomics

ARRAY OF AGRI-STARTUPS IN INDIA

- ~ US\$ 36mn invested in 15 startups in 2017

AgroStar

EM3 Agri Services

Farm Taza

Crofarm

MeraGrocer

GrocerMax

NinjaCart

Freshfalsabzi.com

Gold Farm

CropIn

Aarav Unmanned Systems

Waycool

Aibono

Tessol

MyRML

Intello Labs

AgriApp

FarmLink

FlyBird Innovations

Gramco Infratech Pvt Ltd

Kamal Kisan

VDrone

Rainbow By Green Tech Solut

Triton Foodworks

Stage of Technology to determine Commercialization Approach

- 1. Finished, Marketable Product** ⇔ Ready for Commercial use
- 2. Finished Product but no Interest shown by Industry** ⇔ Start Up/ Scientist Entrepreneurship
- 3. Proof of Concept** ⇔ Requires scaling up//Large Scale Field-Demonstration Trials/R&D
- 4. Bench Scale Research Result** ⇔ Requires Validation and Demonstration
- 5. Intermediary Product with known weakness/ facing known challenge** ⇔ Contract Research
- 6. REGULATORY CLEARANCE IS OBLIGATORY in all situations** ⇔ Who would seek? ⇔ Licensor / Licensee

Technology Transfer: Gross Idea

- 1. GENERIC TECHNOLOGY** ⇔
Agricultural Extension ⇔ Input Market
- 2. BRANDED TECHNOLOGY** ⇔
Market Goodwill + Publicity ⇔ Open Market
- 3. SEED TECHNOLOGY (Generic/Truthfully Labeled)** ⇔
Demonstration ⇔ Public Sector Sale Windows/
Seed Market
- 4. PATENTED/ IPR PROTECTED TECHNOLOGY** ⇔
Production-Distribution/ Assignment/ Licensing
[Identification/Validation/ Valuation/ Expression of
Interest/ Licensing/ R&D/ Incubator/ Commercial
Product/ Market Chain// License Fee/ Royalty]

Agro-IP and Tech Transfer (Gross Idea)



**Patents/
Geographical Indications**



Plant Varieties



Trademarks



Copyright



License agreements



Commercialization



Partnerships

Realm of Law

- **Company Formation Laws**
- **Business Finance Laws**
- **Tax and Accounting Laws**
- **Securities Laws**
- **Labour / Employment Laws**
- **Information Technology Laws**
- **Dispute Resolution**
- **Contract Law**
- **Tort Law**
- **Law of Unfair Competition**
- **Intellectual Property Rights Laws**
- **Environment (Protection) Law**
 - Includes Genetic Engineering, Biosafety
- **Biodiversity Law**
 - Includes Access and Benefit Sharing, Biopiracy

Unfair Competition

- 1. Making/causing confusion as to the products or services or the production or commercialisation activities of a company or business house**
- 2. Misleading the public by making certain allegations or at least indications as regards the method of manufacture of a product, its quality or quantity or any other factor; similarly misleading for services**
- 3. Making discrediting false allegations for the products or services or industrial or commercial activities of an enterprise**

Unfair Competition

- 4. Disclosing and Unfair use of other's trade secrets unlawful acquisition and use of trade secrets by companies or unlawful disclosure of trade secrets by employees or others**
- 5. Free riding/Taking advantage of other's achievements unfair reproduction of copyrighted materials/use of someone's well established trademark**
- 6. Comparative Advertisement indicating other's product without mentioning it**

Sharing IP & TT experience from ICAR-NAIP BSR



Nano-fertilizers and micronutrients in agriculture



Indian Agricultural Research Institute, New Delhi
Central Arid Zone Research Institute, Jodhpur
National Agricultural Innovation Project, New Delhi
Indian Council of Agricultural Research, New Delhi

1. IP Management

- Patent applications
- Copyright
- Trademark
- Plant Varieties

2. Genomic Resources

3. Technologies shortlisted

4. Technology validation

5. Business Planning/ Hand holding/ Investors' Meet / Agreements and Licenses

6. Post-NAIP Agreements

New Central Initiatives in agriculture sector envision improved farmers' fortunes and economy



2011-2020 is the Decade of Innovation as per the National Policy on IPR



- 👉 Make in India
- 👉 Digital India
- 👉 Skill India
- 👉 Start Up India
- Stand Up India

Capture the Spirit of IP Stimulated Growth



FARMERS' PORTAL

"ONE STOP SHOP FOR FARMERS"

Google Custom Search

* Beta Version only in English as of now.
Full version in different languages under development.



Insurance	Storage	Credit	Crops	Extension Activities	Beneficiary List	MSP	Login
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Latest News

- Do you want to know the MAIZE varieties with EARLY maturity?
- Do you want to know the Crop varieties with recommended

Click on the State and Navigate to your Block and Crop

Startup to build a progressive, resilient and win-win agriculture

Input Technology

e-extension

Disaster Management

e-commerce

Value Addition

Export Orientation

RELATED LINKS

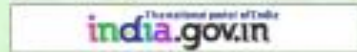
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RELATED DOCUMENTS

- [Farmer Friendly Handbook](#)
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National Policy on Agriculture

- **Fasten agricultural development**
- **Promote value addition**
- **Accelerate growth of agro-business**
- **Create employment in rural areas**
- **Secure a fair standard of living for farmers, agricultural workers and their families**
- **Discourage migration to urban areas**
- **General improvement in the rural socio-economic conditions**
- **Techno-regulatory growth**

Agricultural Policy: Incentives for Agriculture

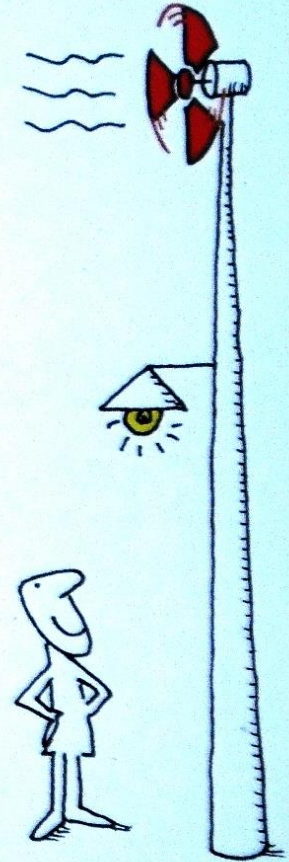
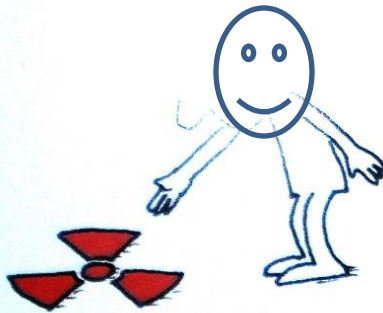
- **Create favourable economic environment**
 - **Increase capital formation**
 - **Increase farmer's own investments**
- **Remove distortions in the incentive regime**
- **Improve the terms of trade with manufacturing sectors**
- **Bring about external and domestic market reforms backed by rationalization of domestic tax structure**
- **Easy availability of credit and other inputs**
- **Infrastructure facilities for development of agro-business industries**
- **Development of effective delivery systems**
- **Freeing movement of agro produce**

Key take away messages ...

- 1. VOLUNTARY CONDUCT** is paramount in abiding regulatory matters as per the prevailing law and make both ends meet
 - **There is no defined Code of Conduct as such**
- 2. The prevailing legislative, policy and executive paradigms should be better harnessed through INDUSTRY–FARMER INTERPLAY and sharing of space in the value-chain**
 - **Expecting govt. support or subsidy from day 1 of your start up make you a weak businessman**
- 3. Cause to widen the scope of agri-business and BRING STARTUPS IN NEW AREAS** such as Bamboos, Bio-agents, Farming Systems, Ag Biotech, Climate Smart Ag, Specific Commodities, Secondary Ag
 - **Thus effectively contribute towards doubling farmers' income**
- 4. Be COMPETITIVE AND EXPORT ORIENTED** for specific commodities
 - **Govt. support may be desirable**

To choose between optimism and fault-finding it is up to you!

अनुस्पर्धा > प्रतिस्पर्धा > ईर्ष्या > द्वेष



Thanks

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NO-RIO (Japan)