

01/08/2023

RNSIT Talk

on Aug 17, 2023 Notes for

o Thanks part ... I am glad that you are going to listen to a series of well accomplished persons from different disciplines. It is a pleasure to be here.

o In my talk I like to be interactive and keep you all in alert mode and me on my toes! Be alert on the questions I will ask & try to reply as best as you can.

o Though I maybe expected to talk on ~~Space~~ Chandrayan, or Vision 2020 etc, I am going to cover some items which

Span ~~the~~ a large gamut of Indian economy and society. Naturally in ^{one} ~~a~~ brief talk, it would be in glimpses.

~~a lot more about with agriculture.~~

That would be my first part.

- ~~the~~ glimpses of span of Indian economy, society. How linkages work.

Second part will be about ~~an~~ a fast emerging area of Space Technology and applications, with a larger focus on Small Satellites.

Third Part will be about a crucial but not so much talked about area of Security - ~~national~~ internal and external.

Fourth Part will be about the future - immediate, ~~or~~ short and medium term - of all of you personally and professionally.

Then ^{fifth} some time for freelance Questions by you and my attempt to answer.

Now the first Part I start with Agriculture.

Have you read about Indian Govt banning export of non-basmati rice? → How many % of you; raise hand.

Do you think it has any global implications at all. Most of us think India is a country of shortages

struggling to meet its two ends.

Do ~~you~~ any one of you know
about India's ^{annual} rice production,
~~the~~ ~~the~~ inputs and exports.

→ Raise hands.
For 2022-23
Overall cereal production was 330.5 MMT
(Million Metric Tonnes)
(calculate for yourselves in Kg)

- of this rice production	135.5 MMT
Wheat	112.7 MMT
Coarse cereals (like Ragi, Jowar etc)	101.8 MMT

India exported more than 22 MMT
of rice.

Please note that these ^{exports} ~~production~~ are
even after exports Govt of India
(that is the Central Govt) gives
FREE RICE of 5kg/person/month

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for more than 800 million people
~~live for that~~ under Garib Kalyan
Yojana.

In addition to this Govt of
India through Food Corporation
of India (FCI) has a STOCK
of ~~42~~ 40.95 MMT as of July 1, 2023
(This is more than three times
the BUFFER norm). Why
this buffer? To ~~not~~ release
in terms of for serious disaster
struck areas and also immediately
to release some stock when
prices rise high. Govt does
not directly interfere in fixation
of prices in the market. It

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~~plans~~ uses with the law
of economics (of free markets)
of Supply & Demand.

~~Now~~ Now coming to
exports of please note that
India is the largest exporter
of rice world wide, accounting
for about 40% of the total 55.6 ^{MMT}
of global trade in rice.

Note the impact
if 40% ^{of supply} is cut-off! Prices
globally ~~is~~ has gone sky
rocketing! Some of our Indians
in US have rushed to buy rice
in their super markets, as ~~not~~
big shops have started rationing!

Indian exports are not only to the Arab countries & USA but also to many African countries which depend on India's supplies.

About 60% of India's rice export are to the African nations.

So the world bodies have raised concern about it!

I won't give further more details, as you can search out

But I want to point out the huge presence of India in cereal production. During

1960's India had a crisis in food supplies. When I was very young, I have seen the

terrible situation in Bombay
(then it was called B'bay) in
Nahin — large ~~queue~~ queues,
terrible quality of wheat imports
from America etc.

Green Revolution and
subsequent technological inputs
in terms of supply of water,
fertiliser, nutrients, machines
in the farms, new irrigation
systems, ~~at~~ better transport of
farm produce etc. — many
such items have contributed
to the commanding position.
Don't imagine farming to
be a lone, poor ~~dirty~~ job
dirty

done by illiterate farmers!

At this point I wish
to point out that many

Also farm incomes also
come from ~~the~~ horticulture,
floriculture, commercial crops
like cotton, edible oils, etc.

You all need to
understand that real growth
and development and thus
CREATION OF WEALTH for
those who do work and through
them the nation, comes
from hundreds of ^{supply} stems in
the input ₂ chains and output

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Supply chains. They can't be stand alone. They all cluster.

Please read in my website and YouTube talks delivered in some colleges, IIT's, schools to understand such chains & clusters, to succeed in your life.

Success of Agriculture is also dependent of Manufacturing sector (which gives machines, chemicals, water supply & equipment; transport of produce, and also most importantly the taking out of the supplies from the fields and convert into useful products like atta.)

The delivery of these is

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through the Trade and financial
Sector — which are called
Services Sector — a huge
wealth creating sector. ~~an~~

They use ~~IT~~ ICT services.

~~the~~ Without ICT services
the transactions will be very
~~slow~~ slow — Imagine your
~~life~~ lives without Google Pay,
Paytm, net banking etc. Similarly
FASTAG has cut down
waiting time in Toll.

So So tomatoes from Kolar
can go to Delhi markets
three or four times faster.
3 or 4
You ~~would~~ work out a few
examples yourselves.

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The hugeness of Indian
manufacturing sector can be
seen by a few examples
(very small samples in a huge pool)

Manuf. Sector 16-17% of GDP
Employs 20% of our Workforce
that is 27.3 million workers.

Passenger Car export 577,875
per year 2021-22

Commercial vehs 92297
per year

Two wheels 4,443,018

Annual Production 22.9 million units
per year.

India Laptop & PC market
is estimated to be \$ 8 Billion Annually
or Rs. 65600 Crores

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Head count of employees
in TOP 10 IT companies
~ 18 lakhs

But ~~not adding only~~
^{change in headcount}

Very little < 100
from last year to now.

Their revenue annual
is \$ 25.7 Billion
~ 2.1 lakh crores.

Look at a figure — annual
addition to total head < 100

So you won't get jobs?

Not ~~ex~~ exactly. This is
where one has to get
into details.

In these top 10 IT
companies — many may be

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laid off if they don't
learn new technologies. AI
will reduce direct intake.

But ^{not that} ~~with~~ these 10 companies
are NOT the whole market

There are other smaller companies;
also users of IT like

B banks, media, hospitals
& health delivery, mobiles etc.

Most of you won't get
a good paying job, if you
can fit into the right slot
of supply chain I mentioned.
I will say a little more
on it in my fourth part

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Let me now get leave
this FASCINATING EXPANSE
of India economy & society.
and go Part Two: Small
Satellites.

How many of you
have heard of Pico, Nano,
Micro Satellites.

→ Raise hands & explain

How many of you had heard
about Starlink, One Web...

What about Elon Musk?
Do you know who he is.

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On one side we have launch vehicles like B our BahuBali
But many in USA, China, Russia,
Europe ... ^{much} bigger than that?
h

But also small satellites?
Do it only for poorer countries
which can't afford big ones!

Try to answer ...

Some points: GEO is at
36000 km.

∴ Radiowaves $\frac{1}{R^2}$ Law.

Even very high power transmitter
energy will be reduced ~~at~~ largely when
it reaches the earth. But antenna
can be pointing in one direction only without
need to ~~be~~ track. Great advantage
for Direct to Home TV etc.

But lower power can sustain only

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lower bit rates... Diff telecom Satellite links can even support 4G easily.

But the trouble with telecom & TV eh is "Eh did manage more!"

India in ~~1980's~~ upto early 1980's did not have a good TV coverage. If we could get STD we thought we were in heaven!

↓
How many know what is STD call?

✶

↓
✶ Thanks to Satellite TV and later because of fibre optic cable which are competitors, we have now more than 300 TV nice colour some HD ~~cont~~ channels too round the clock.

So ~~for~~ Many millions of mobiles ~~have~~ can have TV at the fingertips. Plus ~~so~~ so much

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of internet connections...
High speed ~~connections~~ searches
→ very low latency rates...

Still we want ~~5G~~ 5G.

Best way is to bring the
satellites to down orbit say
400 - 500 km. See the

advantage in $\frac{1}{R^2} = \frac{(36000)^2}{(500)^2}$

But Nature does not give
something good without some
problems $\frac{1}{2}$ associated with it!!

Low orbit satellites are invisible
only for a short duration, say
15 - 20 mins ~~over~~ over a place
Then it will come only after a
few hours.....

If we put many satellites

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in some synchronized manner
we can have continuous coverage.

But the antennas have to track!
That is made possible due to
phased array antennas ... I won't
give all details due to time constraint.

~~The~~ Many advanced technologies, ...
computational systems come into play.

So we can have a constellation
of small satellites and have
continuous higher power reception
of r-f waves!

5G \rightarrow 6G \rightarrow all of
Also coverage all over the globe
which 4G satellites can't give.

Note that all GPS
satellites are in LEO's.

Do you know ~~how~~ whether

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Indian student made small satellites
have been flown. How many?

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But now many more will go!
ISRO has opened up. Govt of India
has opened up ~~Satellite~~ Space sector
to private companies. Already
about > 150 operating.

These are your exciting new
opportunities!

New areas of are: Space
to ground optical communication.....
Read up on that..

Space is not just satellites
& launch vehicles; there are ground systems;
associated ~~ground system~~ applications; a
huge industry - called downstream business
So you look for these as well!

6/8/2023
TOI

QAT-24

Fully owned by private
company Tata

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~~That~~ I ~~now~~ come to
SECURITY. Don't think

Most of us think security
is limited to some obscure work
done in our borders by Defence
Services (military) and internal
Security by Special Police. As if
they are isolated somewhere.

How many of you will
be ready to work for Defence and
Security?

Are you aware of the extent
of technological business involved
in security. Not just HAL ~~to~~ ~~and~~
~~make~~ Defence PSU's to make
missiles, aircraft and tanks.

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India is a biggest importer
of Defence Equipment & System
(Some thing not to be proud of)
Govt is now trying to make
many of them in India. It
is going to be a big industry.

Also Space Technology has pervaded
Defence & Security sectors. See
Some of my talks Space, War &
Security — Google my name

of S. Rajan & look for the talk.
I gave in IIT Roorkee.
Also S. Chandrasekhar: Space,

War & Security -

There are tremendous
opportunities for technical work
in this field. Don't be afraid

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that you have to fight with
guns in difficult terrains.

I urge govt / women to be
a part of ~~a great~~ the huge
supply chain for Defence & Security
system & chains.

I am not giving examples
in this talk. You may ask in Q&A

lastly & You own

Future: Personal & Professional

A I have dealt in some detail
the terms of for personal care
in my ^{recent} Condo Address to
JNEU at Ballia. ~~It~~ I will
give some points.

First & foremost You
all need to take care of

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body & mind. Don't take unnecessary risks with your life.

Death of young people in road accidents is alarming. Don't

& blame it all on potholes

in road! No helmet, over speeding,

drunken driving, stunts, ~~etc~~ driving while talking on mobiles etc

* || To enjoy life, you have to live.

Also Don't ABUSE,

DISUSE

MISUSE

your body & minds.

I will tell some examples

Mobiles, holding

~~sleeps~~ Sleep deficit.

etc etc

~~Don't~~

(Tell some more...)

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Professional :

Fit into a supply chain
of business needs of Industry & Business.

Have you
seen Advt
one skill mk
enough for
Job.?

Don't have some imaginary
ideas about a good job.

Top IT, USA Job, TSRO, DRDO

etc....

If you get ^{one} ~~two~~ of them fine;
but don't waste years & your life
chasing them alone.

As I have briefly pointed out
in the earlier part of my talk there
are hundreds of new areas which
are before you, if you prepare yourselves
for them — in terms of right skilling,
careful tailoring of your CV (of course

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(scrupulously) to show the best match
you may have with the organization /
company to which apply, ~~at~~ preparing
mentally for interview, etc

~~The~~ Some of the areas in which
good job opportunities are available
are:

Data Science
Data handling, AI applications (LLM
Large Language Models)
not just in IT Company but in
banks, ~~Cybersecurity~~ Cyberforensics,
~~the~~ ICT companies customer care,
advertising, retail delivery etc

Other than these other areas
with different domain expertise are

- Infrastructure, Roads, Railways,
Construction sectors,

- Automobile: Conventional &
~~and~~ E-vehicles

- Agriculture: variety of them
including E-Mandi's, Mechanisation, Drones
etc

Ask for
Video

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- Agroprocessing: From Atta to many value added; storage;
- Waste Management of all sorts, waste water recycling, solid wastes, industrial wastes, Waste Reduction, Environmental restoration not just forestry but cleanup mined areas;
- Irrigation: Big size to drip irrigation even at apartments, homes
- Whole range of health sector. Clinical, pharma, telemedicine, retails,
- Space & Defence Industries of various types
- Direct jobs in Defence & Security services

∞ You see the Business People
Just search for more
If you PREPARE YOURSELF YOU WILL SUCCEED

Now Q & A