

Climate change & sustainability

- Broad themes
 - Invasive species, Monoculture
 - carrying capacity of Earth (max popⁿ size ecosystem can sustain w/o degradation)
 - Land-use change
 - zoonotic spillovers & diseases, permafrost melt
 - (warming ⇒ mosquitoes spread, sea-level rise ⇒ water borne diseases)
 - ↳ also vectors spread
 - Agri & food security ⇒ need for CSA
 - Inequality ↑ ⇒ coping capacities ⇒ heat waves & extreme weather events
 - climate finance: ↓ + Mitigation > adaptation

- Broad solutions
 - Biosphere reserves ⇒ UNESCO MAB (1971) ⇒ harmonious coexistence
 - SDG: middle path b/w env. & dev. ⇒ anything sustainable ⇒ talk abt 3 aspects (eco, social, env.)
 - Funds
 - ↳ available ones: GCF, GEF, L & D
 - ↳ Need to create: Biodiversity fund
 - CBDR + historical climate justice + intergenerational equity
 - Carbon mkts
 - ↳ Carbon Taxes: ₹400/tonne on coal
 - ↳ Carbon Trading: Energy Conservation Act 2022 (Min. of Power)
 - ↳ Global efforts
 - ↳ Kyoto → Paris Agreement
 - Frontier technology: CCUS
 - Tech transfers + funds for green transition ⇒ IP challenge

These are themes around which soln to any climate change issue has to be devised

- Steps by India
 - Panchsheel goals (Active Recall)
 - Schemes: MISHTI, PM PRANAM, NAPCC, Carbon Credit Trading scheme, Rooftop solar scheme
 - ES: IFC report ⇒ India only a20 nation in line with 2°C target
 - legislations: WPA 1972, FCA 1980, EPA 1986
 - 2024: share of non-fossil fuel in energy = 45.4%
 - **weightage of forest cover in Tax devolution (10%) (ES)**
 - Intl. leadership: ISA, CDRI, Mission LIFE ⇒ Incentivize states

Cumulative emissions : USA (25%) > EU (22%)

Both aspects are crucial to equity argument, esp. with the per capita catch

India (4% despite 17% pop^{ln})
Developed world = Abt 80%

Present emissions : China (30%) > US (15%)
> India (7%)

- CBDR RR

Per capita : < 2% of global emissions
+ terms by India

Fair & equitable burden sharing → Art 2.2 of Paris Agreement

Already 1.1°C heated
⇒ carbon budget

Polluter pays principle ⇒ historical + present

ACF set up in 2010 : \$100B per yr by 2020

(target shifted to 2025, met in 2022 (\$116B) as per OECD report, only \$32B towards adaptation)

- Climate Finance → sources

- Public \$: limited
- Pvt. capital : Mitigation > adaptation
- Carbon Mkts. → carbon tax, cap & trade
- Development banks : Need to de-risk green investments

As per WB Rep.: State & Trends of C Pricing 2024: C Pricing revenues exceeded \$100B for 1st time in 2023

Data : Developing countries need \$2.4 Trillion annually for green transition

as per an expert grp constituted as part of COP 27

b/w now & 2030 ⇒ 4x of current investments

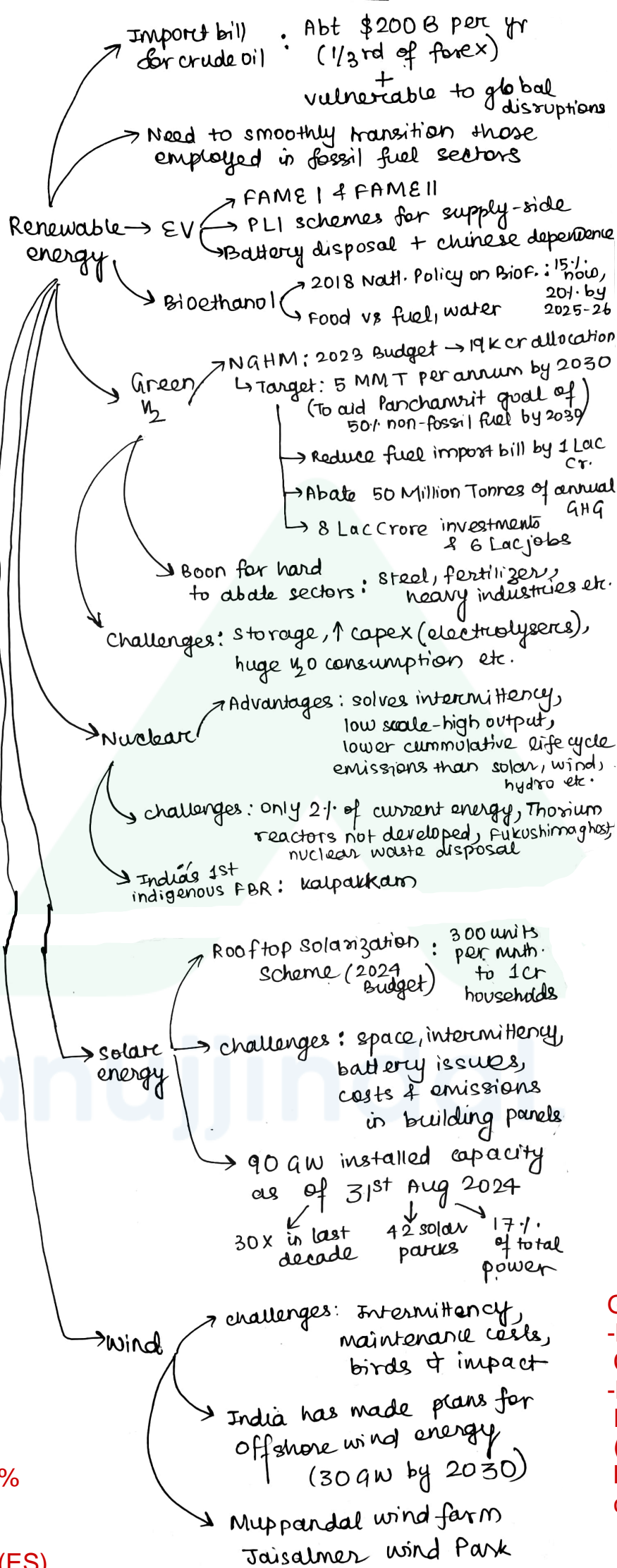
Instruments : Green bonds, Loans, grants, Tech transfer, Debt for climate swaps

Green bonds ka prob. ⇒ Greenium (premium investors need to pay for green bonds ⇒ bond price down ⇒ bond yield up) ⇒ RBI recalled 10 yr green bonds auction since mkt. not ready for it

~~India alone needs \$170B every yr for its INDC~~

explain? ←

According to the RBI's Report on Currency and Finance FY23, India will need an additional annual investment of at least 2.5% of GDP for green financing till 2030



India's power mix:
(Data from Ministry of Power, May 2023)

- Coal: 49%
- Hydro: 11%
- Solar: 16%
- Wind: 10%
- Nuclear: Less than 2%

-Renewables: 45.4% (ES)

- Govt. steps:
- Renewable Energy Certi (REC): tradable
 - Renewable Purchase Obligation (RPO): for Discoms & large electricity consumers

Climate change as an actor-less security threat

29 May 2023 23:20

- Disasters and the risks to critical infrastructures. Military being deployed in routine disaster response that consumes the bandwidth.
- Challenges to food, water etc. security, vital to national security & strategic autonomy as well may lead to internal unrest and civil strife due to shortages and migration.
- Geopolitical competition due to race to capture certain resources & minerals critical to resilient green transition. Other domains of competition could be for fish stocks (fish migrating due to climate reasons or depleting) or melting of Arctic that would accelerate the rush to take control of the minerals & trade routes trapped within.
- It forms a nexus with other forms of direct security risks like terrorism & extremism as climate change-induced impoverishment & sub-optimal governance may give rise to breeding ground for terror recruits as seen in part of Africa. So while being itself a soft security issue, climate change may exacerbate the hard security threats.
So, climate sustainability is no longer desirable, but a national security imperative.

Very unique dimension to climate change; PESTEL HINGE mein bhi aata hai => recallable + nobody else will write on it

→ Tigris dry => ISIS boost

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Impact of climate change on financial sector

We will do stakeholder analysis here.
=> isko ghul ke pi jao

Preferably add one piece of data for each stakeholder & you are sure to get max. possible marks in this Q/essay

① Impact on banks & NBFCs

No good data here

reputational risk (pressure to delist from C intensive sectors)

collateral risk

(collateral like real estate impacted by flooding, sea level rise etc.)

operational risk to bank infra

quality of credit ↓ due to repayment capacity of borrowers (mention examples)

Banks exposed to many sectors that may be adversely impacted by climate change ⇒ contagion (mkt. risk) → financial stability

limitations of traditional risk mgt strategies (eg. insurance)

individual risk mgt.

can't handle sector-wide risks

② Central Bank

2 pieces of facts & data here enough

Efficacy of monetary policy ↓ due to supply shocks (inflation)

Last few yrs mein heatwaves and monsoon shift driving food inflation even when core inflation in check

Increased regulatory oversight to account for climate risks in stress-testing, disclosures, systemic resilience etc.

currency risk due to climate related supply disruptions + increased financial stability burden

eg. 18 items that make up for 75% of

Indian exports are agri & natural products (cereals, textiles, fish, fruits, spices, food grain etc.)

eg. Green protectionism

⇒ vulnerability to climate change

⇒ exchange rate risk

Tourism sector at risk from climate change

③ Businesses

cost of capital ↑ as investors incorporate climate risks into assessment

Also green technologies themselves very capital intensive

C-intensive sectors

carbon tax Iska data likh do

reputational risk

Higher capital cost Phasing out of govt. subsidies

supply chain disruptions due to climate risks (overdependence on certain geographies)

Also disruptions of operations more frequent due to more disasters, extreme weather events etc.

Insurance premiums ↑ for

climate sensitive assets ⇒ operational cost ↑

Asset depreciation (in high-risk areas)

Physical assets like factories or real estate in high-risk areas could suffer from devaluation due to increased vulnerability to climate events.

Compliance burdens (carbon tax, cap & trade, green stde.)

Isme ek piece of data (GST compensatory cess on coal, Rs. 400 per tonne)

④ Investors & Asset Managers

Portfolio risk to climate - exposed sectors

eg. Bonds, stocks, assets held of these sectors

liquidity risk : climate disruption

Sudden revaluations or market corrections triggered by climate-related events could make assets less liquid, leading to significant market volatility & potential losses

Stranded assets ⇒ C-intensive sectors under ↑ global reg. scrutiny ⇒ write-offs & losses

Isme no data to quote as such

⑤ Insurance companies

Higher payouts ⇒ sector-wide risks

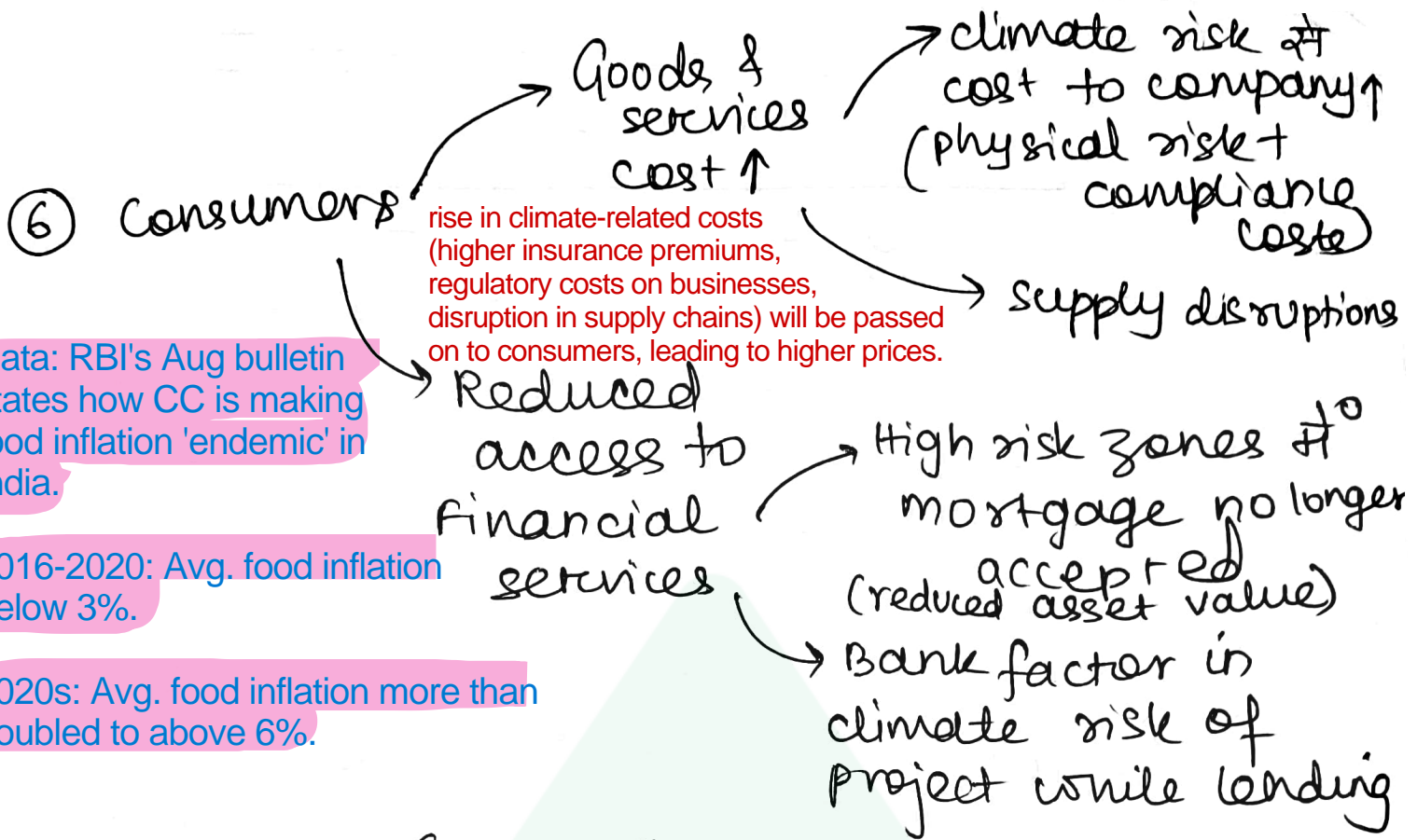
extreme weather events & frequent disasters

Premium ↑ ⇒ loss of customers

Investment risks ⇒ real estate or infra projects ↓

climate risks (physical), compliance costs etc. ← returns to them.

No good data here too



Data: RBI's Aug bulletin states how CC is making food inflation 'endemic' in India.

2016-2020: Avg. food inflation below 3%.

2020s: Avg. food inflation more than doubled to above 6%.



Data: Green investments require 2.5% of GDP ANNUALLY until 2030 for India's green transition goals as per RBI C&F report 2023.

⑧ CRA → Need to factor in climate risks into their assessments to remain credible

Isme no data needed, just analytical point