X.5 Sustainable Dev^t: Ecology & Economic Progress

Dev^t & Sustainable Dev^t

→ Dev^t ($\vec{D}$) : vector of desirable social objectives deemed fit by dev^t agencies, state etc. (⇒ open to ethical debate)
it may include (not exhaustively) – ↑education, ↑ per capita Y, improvement in health & nutritional status, access to basic freedoms etc.

Sustainable dev^t ⇒ when vector D does not decrease overtime.

Probs with def^n: (1) Assumes infinite time horizon. Policy decisions, however, are taken in a finite space

(2) Does not make a distinction b/w strong sustainability ($\frac{dD}{dt} > 0$ for each and every time period) vs weak sustainability (whether trend of $\frac{dD}{dt}$ must be > 0) or PDV benifits must exceed costs

→ Idea of sustainability is better to be interpreted in its weak form ($\frac{dD}{dt}$ is 'generally' +ve over selected time horizon)
→ underlying idea of weak sustainability is ass^n that there has been some degradation or extinction of resources.

∴ Sustainable dev^t ⇒

(a) vector D is non-√^{g} overtime.
(b) Elements of D open to debate
(c) Relevant time horizon for policy decision making is indeterminate
(d) Intergenerational objectives considered.

Yet, they exist several probs with the generality of the def^n

CONDITIONS FOR ACHIEVING SUSTAINABLE DEVT (Debatable def^n condition)

Key necessary condition — natural K stock ⟷

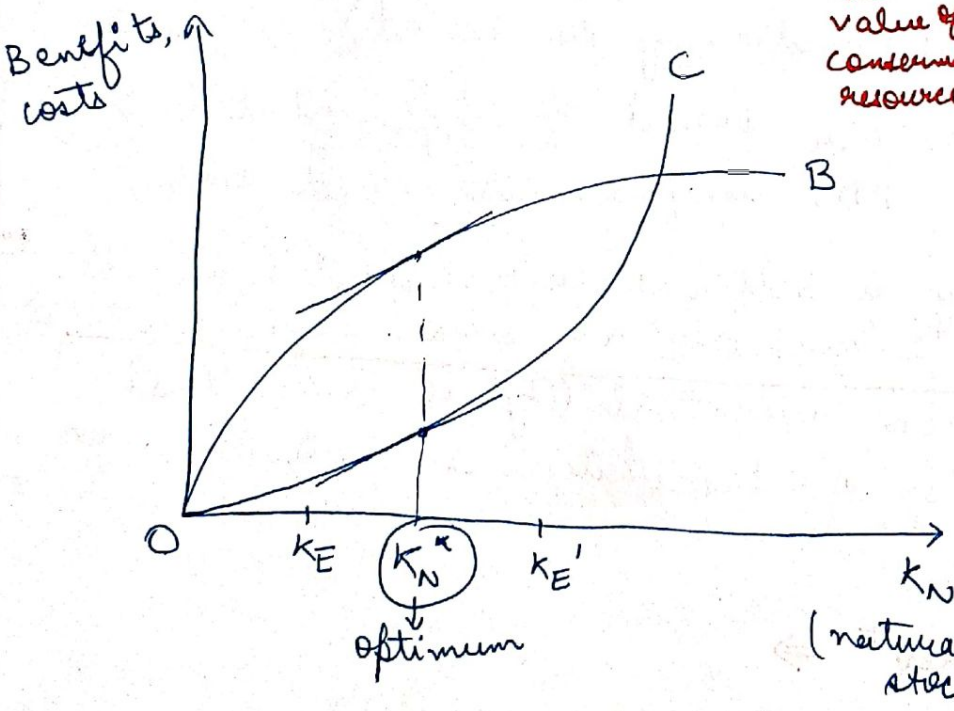
⇓

non-ve Δ in stock of natural resources & environmental quality (conservation necessary; improvements are welcome)

defined broadly ← & quality to include all qty & natural resources

(World Commission Report, 1987)

However, Δ^g Natural K stock has advantages ∀ prod^n, c^n (eco^y as a whole) ⇒ a cost-Benefit analysis is essential to determine optimum stock.



Total eco^c value of conserved resources = B = (~~Total economic value~~ Benefits from ↑^g Natural K stock

= use value + non-use value

use value → for wildlife obs., recreation, scientific study, pollution control, waste-sink)

non-use value → existence value to non-users

C = as K_N ↑^Δ ⇒ ∃ ↑^g costs in the form of foregone benifits from not conserv^g the environment. (eg: dev^t foregone by not doing deforestation)

If $K_N < K_N^*$ → Beneficial to ↑ stock by ↓^g degradation

$K_N > K_N^*$ → Benificial to reduce stock by ↑^g degradation

∴ Follow^g the def^n of sustainable dev^t, maintenance is required iff we are at K_N^* or ↑ is reqd. iff we are to the left of K_N^*. why doesn't the def^n then also talk about ↓^{g} Natural K stock (pt. to right of K_N^*)? then why is conservation of exist^g stock imp.?

1.) For dev^g countries generally ~~of~~ → $K_N < K_N^*$

2.) The cost benefit analysis only compares 'value' of increas^g natural resources with opp. cost of degrad^g them & us^g them for ↑^{g} dev^t. It does not consider their multifunctionality into integrated life support system.

∴ Even if a ctry can afford degradation (to the right of K_N^*) there are risks of doing so as-

(a) Imperfect understand^g of K_N as life support system

(b) Even if degradation was reversible, there exists low capability to substitute / reverse it later

(c) ∃ losses due to irreversibility.

∴ when uncertainity + irreversibility exist ⇒ rationale ∀ conserv^g exist^g stock until a clearer determination of optimal stock can be made

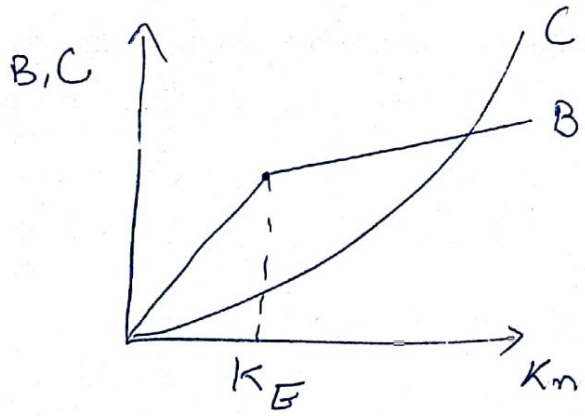
3.) use of concepts of willingness to pay (for ↑ in size of exist^g asset) and willingness to accept (for ↓ in ———) measures of benefit.

Eco^c theory ⇒^{s} willingness to pay + a small gain = ——— accept (compensation) on giv^g up a small amt. of asset.

b/w the two. Compensation req'd is much higher. (4)

Why? Existg stock is the reference point ⇒ Prospect theory → attitudes to givg up somethg we ~~hav~~ already have is diff. from when ∃ prospect of gain.

↳ Benefit curve is "kinked" at existg stock.



If existg stock represents the kink ⇒ optimal stock = existg K stock (K_n)

∴ The defn of sustainable devt that calls ∀ a constant K stock ⇒ a higher valuation should be placed on reduction of existg K stock (∵ B curve is steeper before K_E) than ↓g it ∴ ∴ conservation is imp. & depends on K_E. ∉ which is ipso facto = K_N)