

- Supply side aspect of forest products
- Production theory as applied to forestry
- Production function in economics

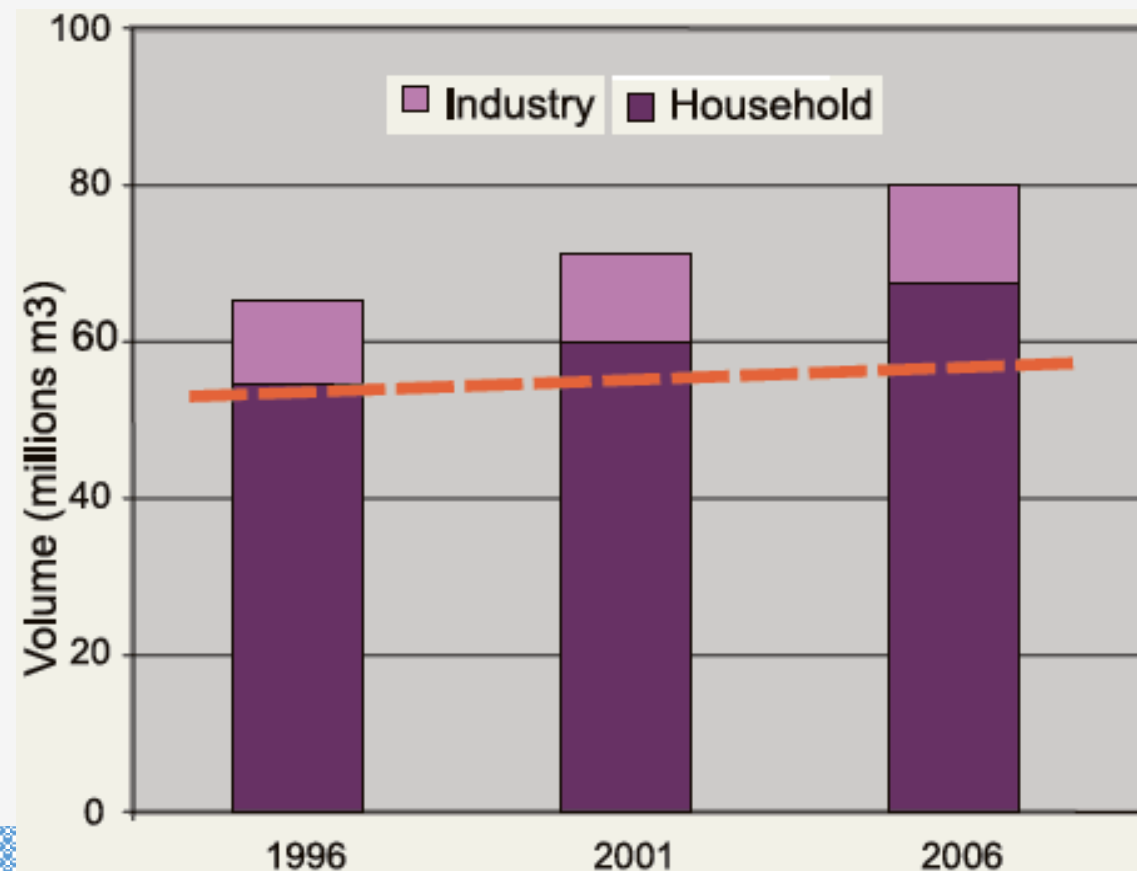
# Forestry supply

- As per land-use pattern, forestry is 2<sup>nd</sup> largest in India
- A top producer of tropical logs in member countries of ITTO
- Around 300 million poor people deriving their livelihoods from forestry

## Indian forest industrial factsheet

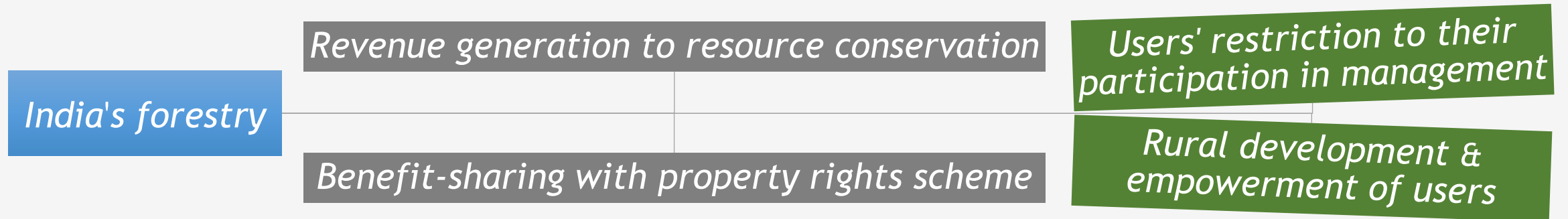
DD (industry category)	2000	2010	2020
Pulpwood-Based	8.76	21.92	45.86
Panel Wood-Based	11.55	18.82	30.53
Durable wood-Based	37.69	54.26	76.61
<b>Total</b>	<b>58.00</b>	<b>95.00</b>	<b>153.00</b>

SS (million cu.m.)	2000		2010		2020	
	Wood	Fuel wood	Wood	Fuel wood	Wood	Fuel wood
Natural Forest	14	37	14	37	14	37
Government Plantations	9.24	3.96	22.16	9.50	32.16	13.95
Social Forestry	5.80	3.10	13.80	8.44	13.80	8.44
<b>Total (Rounded off)</b>	<b>29</b>	<b>44</b>	<b>50</b>	<b>54</b>	<b>60</b>	<b>59</b>



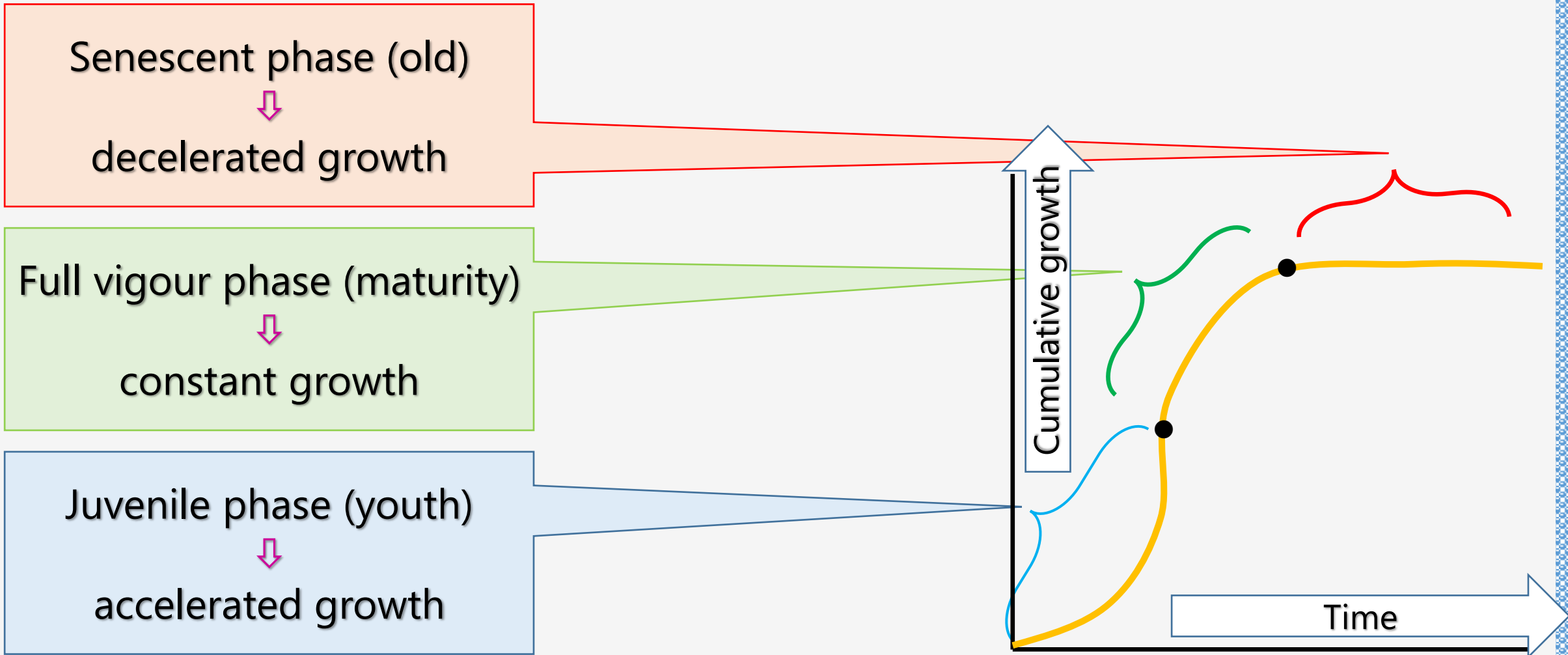
# Forestry supply

## Indian forestry from management perspective



- ✓ Flow of revenue (direct use value)
  - ✓ Flow of services (indirect use value)
  - ✓ Flow of environmental benefits (carbon sequestration)
- 👉 win-win solution through cooperative strategies by both users & regulator
- ⇒ possible by ensuring regularity in supply of benefits to users

# Forestry: production theory non-linear/exponential growth of tree



# Forestry: production theory ☞ determination of economic rotation age

How to determine the economic rotation age

☞ when cutting of tree would be beneficial

- **CAI** (*current annual increment*): Vol at current age  $t$  – Vol at past age  $t-1$
- **MAI** (*mean annual increment*): Tot Vol / Age at any given point

Economics ☞ average change

Economics ☞ marginal change

Age	Vol (cft)	MAI	CAI
1	1.0	1.0	
2	3.3	1.7	2.3
3	6.2	2.1	2.9
4	9.4	2.4	3.2
5	13.0	2.6	3.6
6	16.9	2.8	3.9
7	21.1	3.0	4.2
8	25.7	3.2	4.6
9	30.1	3.3	4.4
10	33.8	3.4	3.7
11	37.2	3.4	3.4
12	39.9	3.3	2.7
13	41.8	3.2	2.2
14	43.5	3.1	1.7
15	44.7	3.0	1.2

Let, cut the tree at age 15 yrs

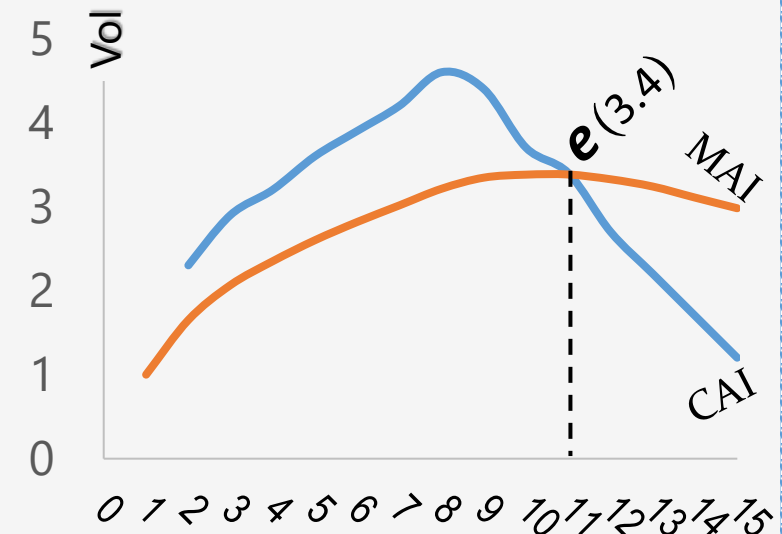
☞ Total volume = 44.7 cft

If cut it such as at age 11 yrs

☞ Vol = 37.2 cft + replant area

Replant area after 4 yrs gives vol = 9.4 cft

So same site gives 46.6 (37.2+9.4) instead of 44.7



# Economics: production theory

- Production function is simply technical/mathematical descriptions about productive processes (input-output relation)
- Economists continue to use it from long past to help understand and describe behaviour of firms
- Researchers in the field of farm have taken same idea to model biological production processes

