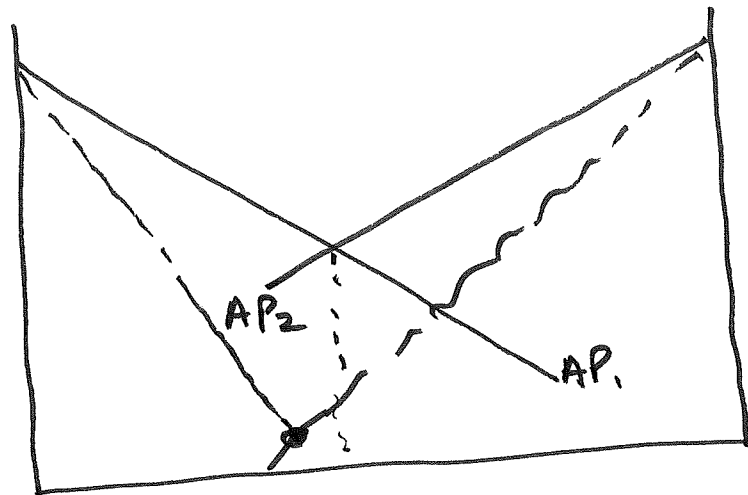
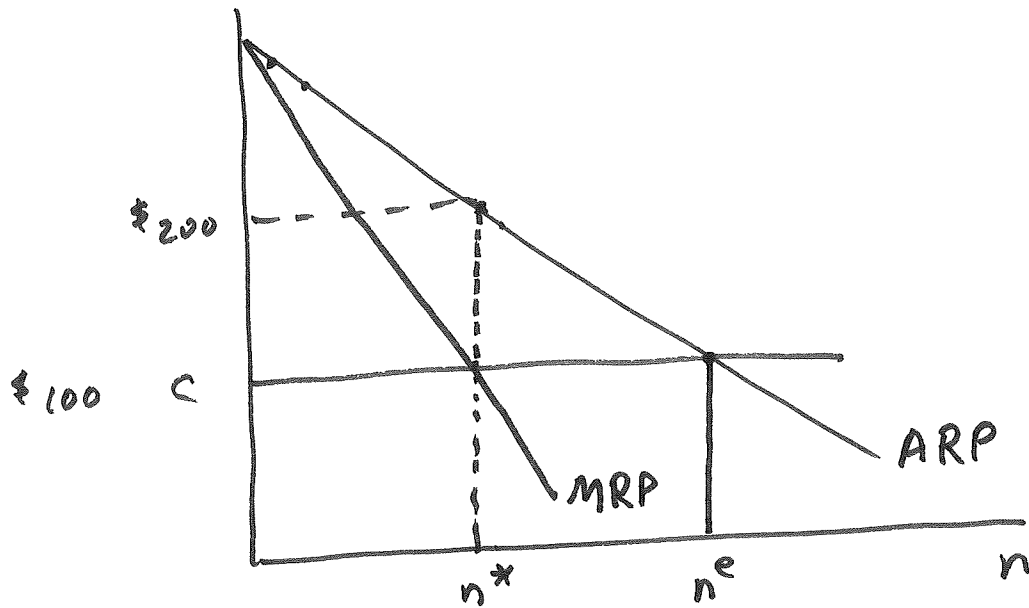


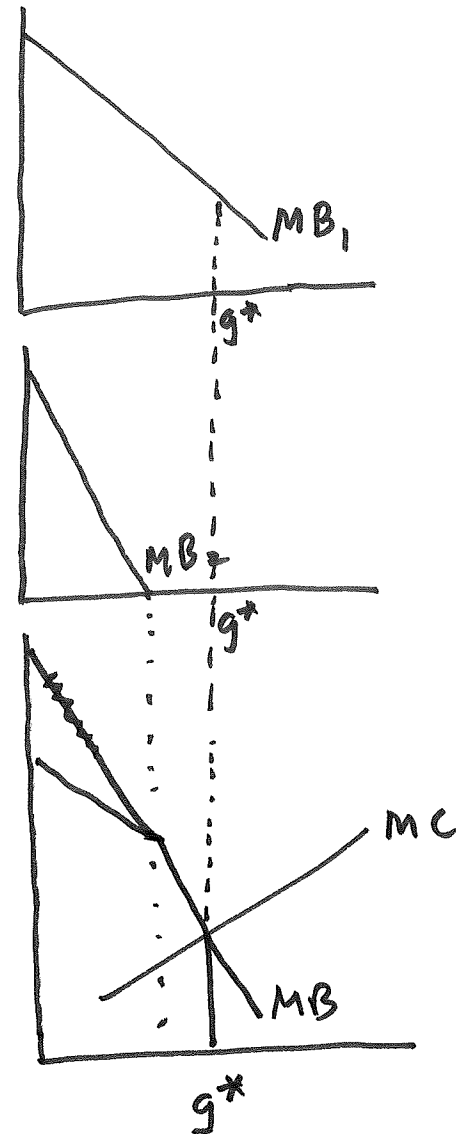
Tragedy of the Commons.



Public GoodsNon-excludable \rightarrow markets don't work

Non-rival

Partial Equilibrium:



2-good 2-person GE model.

$$u^1(x^1, g)$$

$$u^2(x^2, g) = u^2(x - x^1, g) \quad \text{where } x^1 + x^2 = x$$

$$F(x, g) = 0$$

$$\text{Max } u^1 \quad \text{s.t.} \quad u^2 = \bar{u}^2 \quad \& \quad F(x, g) = 0$$

$$\mathcal{L} = u^1(x^1, g) + \lambda (u^2 - \bar{u}^2(x - x^1, g)) + \mu F(x, g)$$

$$\frac{\partial \mathcal{L}}{\partial x^1} = u^1_{x^1} + \lambda (-u^2_{x^1} (-1)) = 0 \quad \left. \vphantom{\frac{\partial \mathcal{L}}{\partial x^1}} \right\} u^1_{x^1} = -\lambda u^2_{x^1} = -\mu F_x$$

$$\frac{\partial \mathcal{L}}{\partial x} = \lambda (-u^2_x) + \mu F_x = 0$$

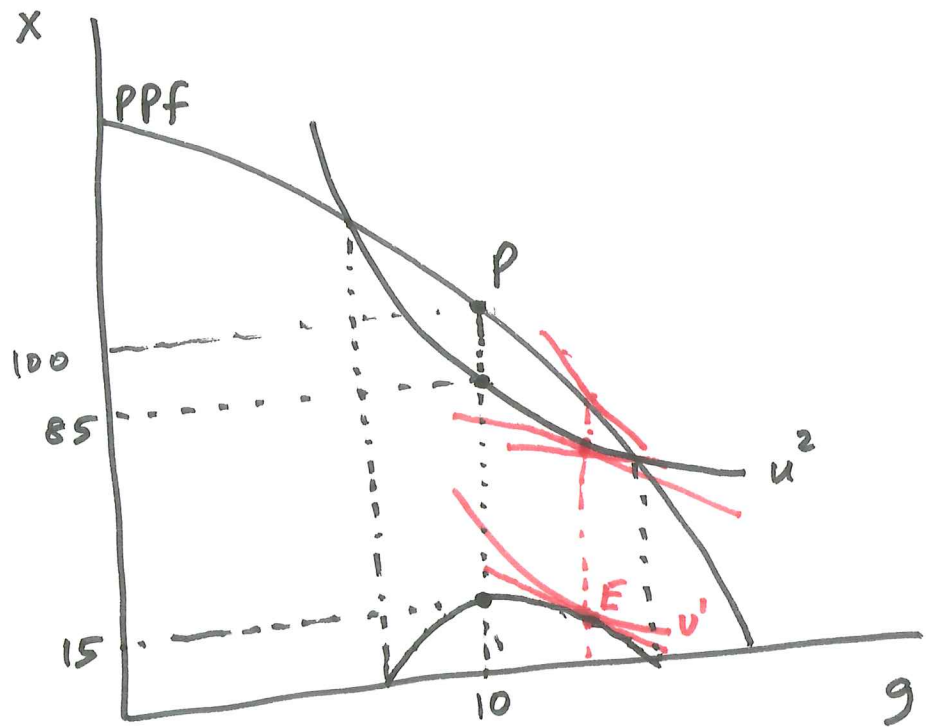
$$\frac{\partial \mathcal{L}}{\partial g} = u^1_g - \lambda u^2_g + \mu F_g = 0$$

$$u^1_g - \lambda u^2_g = -\mu F_g$$

$$\frac{u^1_g}{u^1_{x^1}} + \frac{\cancel{\lambda} u^2_g}{\cancel{-\lambda} u^2_{x^1}} = \frac{+\cancel{\mu} F_g}{+\cancel{\mu} F_x}$$

$$\frac{u^1_g}{u^1_{x^1}} + \frac{u^2_g}{u^2_{x^1}} = \frac{F_g}{F_x}$$

$$\text{MRS}^1 + \text{MRS}^2 = \text{MRT}$$



Demand Revelation.

	Value	Groves	Net	Clarke	
A	-195	+200	+5	0	
B	-200	+205	+5	0	
C	+400	-395	+5	-395	+5
	<u>+5</u>				