5.2.2 Environmental Standards

$$\max_{L,S,K} \quad f(L,S,K) - wL - pS - rK$$

$$f_L = w \qquad f_S = p \qquad f_K = r$$

$$T = 0$$

$$S^* = S$$

$$f(L,S,K) = f_L L + f_S S + f_K K$$
$$wL + pS = f(L,S,K) - f_K K$$

$$Y \equiv wL + (1-\alpha)pS + T + r\bar{K}$$

$$Y = wL + pS - \alpha pS + r\bar{K}$$
$$Y = f(L,S,K) - f_K K - \alpha pS + r\bar{K}$$
$$Y = f(L,S,K) + r(\bar{K} - K) - \alpha f_S S$$

$$\max_S \quad U(Y, S^*)$$
$$\max_S \quad U\left(f(L,S,K) + r(\bar{K} - K) - \alpha f_S S, S^*\right)$$

$$\frac{\partial U}{\partial S} = U_Y \left(f_S - f_{SS}\alpha S - \alpha f_S\right) + U_S \stackrel{!}{=} 0$$
$$f_S = -\frac{U_S}{U_Y} + \alpha\left(f_S + f_{SS}S\right)$$