

Annex 2

Selected Exercises



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1. Given the information below obtain the water production costs before and after a natural disaster

	Before the disaster	After the disaster
Average cost of production of m ³	Mo	Ms
Average volume, produced daily, m ³ /day	Vo	Vs
Average daily cost, in \$/day	Do=Vo*Mo	Ds=Vs*Ms

The cost of water production per day before the disaster is $= V_o * M_o$

The cost of water production per day following the disaster is $= V_s * M_s$

The difference in costs per day $= (V_s * M_s) - (V_o * M_o)$

The total costs $= [(V_s * M_s) - (V_o * M_o)] * \text{Number of days}$

	Before the disaster	After the disaster
Average cost of production of m ³	0.02 US\$	0.035
Average volume, produced daily, m ³ /day	10 000	12 000
Average daily cost, in \$/day	200	420

In the example given above, the average daily cost before the disaster is 200 and the average daily costs following the disaster is 420. The additional cost due to the disaster is thus $420 - 200 = 220$. If the emergency situation lasts for 10 days, the total cost is equal to $200 * 10 = 2000$ US\$.



2. Assume a natural disaster has for two consecutive years a negative effect on the exports of commodity j of country j. How is this cost computed?

Let X_{ijo} = exports of commodity j before the disaster.

Let X_{ijs} = exports of commodity j during the year in which the disaster occurs.

Let X_{ijs1} = exports of commodity j one year after the disaster occurs.

Let X_{ijs2} = exports of commodity j two years after the disaster occurs.

Total loss of income from reduced exports = $X_{ijs} + X_{ijs1} + X_{ijs2}$

3. Assume a natural disaster has for one year a positive effect on the exports of commodity j of country j. How is this cost computed?

Let X_{ijo} = exports of commodity j before the disaster.

Let X_{ijs} = exports of commodity j during the year in which the disaster occurs.

Let X_{ijs1} = exports of commodity j one year after the disaster occurs.

Total loss of income from reduced exports = $X_{ijs} + X_{ijs1}$

4. Assume that the operating costs per truck-km, are US\$ 123.53, and that, on average, trucks carry 6.6. tons of cargo. The distance between town A and town B, by road, is 271 km. Obtain the cost per-ton of transportation.

Cost = $[(123.53)(271)]/6.6 = 5,072$ per ton



5. Following with exercise 4. above assume that due to the occurrence of a natural disaster, the merchandise will have to be transported first by road and then by water to reach its destination. Assume further that the distance by road is 100 Km and by water 171 Km and that the operating costs by road are US\$ 123.53 and by water 140US\$.

$$\text{Cost} = [(123.53)(100)]/6.6 + (140)(171)]/6.6 = 5,487 \text{ per ton}$$

6. Using the data provided in exercises 4 and 6 obtain the increase in cost due for the transportation of 10 tons.

$$\text{The increase in the cost per ton} = 5,487 - 5,072 = 415 \text{ US\$}$$

$$\text{The increase in cost per ten tons} = 415 * 10 = 4,150 \text{ US\$}.$$

7. Given the information on industrial buildings and installation below provide an estimate of the damage per company and of the total damage.

Estimate of damage (at replacement prices)			
Company	Area affected in 000 m2	Cost per m2 constructed	Total value (millions of pesos)
Large			
10 manufacturing companies	20	500	
2 boat building companies	6	200	
2 resin and synthetic fabric companies	5	175	
Mid-sized			
300 severely damaged	420	350	
100 with minor damages	140	160	
Small			
400 severely damaged	200	1000	
250 with minor damage	125	450	



8. Suppose the GDP that originates in the commercial sector is equal to 1.7 billion US\$ the year prior to the disaster. The GDP growth forecast for 1988 without the disaster is 1.82 billion US\$. Using the information provided in the table for damaged firms below compute the cost of the disaster and its impact on GDP.

Production in the commercial sector					
Activity	Number of establishments	Persons employed	Inventories	Amount of sales	Estimated damage Value added
Unprocessed food	2529	3507	38	320	88
Livestock and food of animal origin	2914	4239	14	358	138
Processed food, beverages and tobacco	15474	26187	313	3278	313
Clothing and apparel	3255	6476	320	1071	305
Personal items	620	1777	76	351	114
Appliances	1059	2729	153	721	178
Department stores	520	2026	163	616	220
Gas and fuels	822	1262	30	121	38
Farm and forestry	200	3514	248	1798	468
Construction materials	410	2096	22	1110	233
Machinery and spare parts	4	159	4	57	12
Office equipment	715	3036	270	1163	340
Real estate	137	315	12	74	22



