

EVALUATION AND DESCRIPTION OF FEASIBLE POTENTIAL ADAPTATION MEASURES



WP3 of ADAGIO

Contribution of P8 ADAGIO participant

Prof. Mahmoud Medany

Central Laboratory for Agricultural Climate
(CLAC)



WP3

Carrying out the regional pilot assessment of ongoing and feasible potential adaptation measures on the selected agroecosystems in Nile Delta

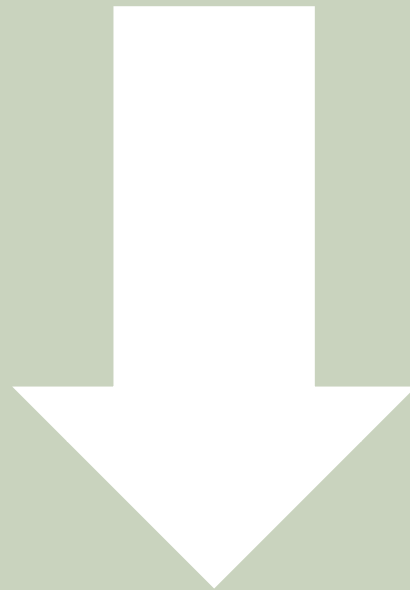
Pilot assessment study:

- **Establishing a list of possible adaptation measures (previous studies, experts, ...).**
- **A significant part of the suggested adaptation measures will be oriented to “Agricultural management practices” category.**
- **Conduct pilot survey in the project selected spots in Delta to find out the feasibility of the proposed adaptation measures from the stakeholders point of view.**
- **The feasible adaptation measures will be analyzed in terms of uncertainties, cost/benefits, risks, opportunities.**

Questions about ADAPTATION

1. **Farmers' perception to improve their knowledge about adaptation?**
2. **What are the acceptable options of adaptations at farmers' level?**
3. **Insurance and financial systems of adaptation?**
4. **Land loss fact in North Delta and land alternative dilemma?**

Evaluation of Experts



Adaptation at farmers' level

The most efficient justifications- according to farmers' perception to reduce the negative impacts of climate change (warmer and dryer climate) on cultivation systems!



1	Changing cultivars	77 %
2	Increasing irrigation requirements	53 %
3	Changing sowing dates	50 %
4	Changing crop pattern	33 %
5	Improving drainage systems	31 %
6	Modifying plant protection programs.	18 %
7	Changing the current irrigation systems	15 %
8	Changing fertilization requirements.	14 %
9	Using compost	10 %
10	Cultivate the land one season only.	3 %
11	Replace the current fertilizers by soil conditioners.	5 %
12	Leave the current cultivated land, and move to reclaim new land.	5 %
13	Leave the agri-business and find other carrier.	3 %

Adaptation at farmers' level (Cost Benefit)



Cost/ Benefit

Adaptation Measures		Very high				Very low
		1	2	3	4	5
1	Changing cultivars					
2	Increasing irrigation requirements					
3	Changing sowing dates					
4	Changing crop pattern					
5	Improving drainage systems					
6	Modifying plant protection programs.					
7	Changing the current irrigation systems					
8	Changing fertilization requirements.					
9	Using compost					
10	Cultivate the land one season only.					
11	Replace the current fertilizers by soil conditioners.					
12	Leave the current cultivated land, and move to reclaim new land.					
13	Leave the agri-business and find other carrier.					

Adaptation at farmers' level (Opportunities, Limitations & Risks)



	Available	Implementation time (years)					Infrastructure	Human resources	Policies	Tech. level	Knowledge level	Implementation time
		<5	5-10	10-15	15-20	>20						
1	Changing cultivars	Not available but possible										5-10
2	Increasing irrigation requirements	Not available & impossible						Not available but possible	Not available but possible			15-20
3	Changing sowing dates	Available					Not available but possible					<5
4	Changing crop pattern	Available										<5
5	Improving drainage systems	Available										5-10
6	Modifying plant protection programs.	Available										<5
7	Changing the current irrigation systems	Available										10-15
8	Changing fertilization requirements.	Available						Not available but possible				<5
9	Using compost	Available										<5
10	Cultivate the land one season, and left it to rest in the second season.	Available						Not available but possible	Not available but possible	Not available but possible		5-10
11	Replace the current fertilizers by soil conditioners.	Available						Not available but possible	Not available but possible	Not available but possible		15-20
12	Leave the current cultivated land, and move to reclaim new land.	Available						Not available but possible	Not available but possible	Not available but possible		>20
13	Leave the agri-business and find other carrier.	Available					Not available & impossible	Not available & impossible	Not available & impossible	Not available & impossible		>20

Insurance and Financial Resources of Adaptation



Options to overcome the losses in agriculture production due to unfavorable weather conditions in the future & to offer the needed financial resources for adaptation.

1	The government should handle the whole problem, and present the procedures, solutions and compensations.	42 %
2	Establishing a special farmers' cooperative-box from now by cooperation between the farmers and their neighbors.	25 %
3	Establishing a new tax on crops prices.	9 %
4	Establishing a special insurance system in insurance companies.	8 %
5	Sharing in a governmental insurance box for future environmental hazards.	5 %

Insurance and Financial Resources of Adaptation (Cost Benefit)



		Cost/ Benefit				
		Very high				Very low
Adaptation Measures		1	2	3	4	5
1	The government should handle the whole problem, and present the procedures, solutions and compensations.					
2	Establishing a special farmers' cooperative-box from now by cooperation between the farmers and their neighbors.					
3	Establishing a new tax on crops prices.					
4	Establishing a special insurance system in insurance companies.					
5	Sharing in a governmental insurance box for future environmental hazards.					

SLR and its impact in North Delta

Actions to face land loss due to SLR and salinity buildup in Northern Delta



1	Continues supply by extra amounts agricultural gypsum and compost, to improve soil characteristics.	69%
2	Gradual increase in cultivating salinity tolerant crops.	64%
3	Adding soil layers to land in order to increase its elevation.	43%
4	Establish a new drainage system in field, equipped with a suction pumping unit, to remove the excessive water table and control it in a constant level.	29%
5	Gradual decrease in the current cultivating area to obtain a higher level of crop management with a constant level of production cost.	9%
6	Switch cropping activates to aquaculture	5%
7	Leave the current cultivated land, and move to other land located away from the sea.	2%
8	Leave the agri-business and find other carrier.	1%

SLR and its impact in North Delta (Cost Benefit)



		Cost/ Benefit				
		Very high	→			Very low
Adaptation Measures		1	2	3	4	5
1	Continues supply by extra amounts agricultural gypsum and compost, to improve soil characteristics.					
2	Gradual increase in cultivating salinity tolerant crops.					
3	Adding soil layers to land in order to increase its elevation.					
4	Establish a new drainage system in field, equipped with a suction pumping unit, to remove the excessive water table and control it in a constant level.					
5	Gradual decrease in the current cultivating area to obtain a higher level of crop management with a constant level of production cost.					
6	Switch cropping activates to aquaculture					
7	Leave the current cultivated land, and move to other land located away from the sea.					
8	Leave the agri-business and find other carrier.					

Summary

Farmers' Level

- Changing sowing dates.

Uncertainty

- Marketing constrains.
- Technology limitations.
- To how far crops flexibility are available to changing sowing dates

Summary

Regional Level:

- Improve the current irrigation & drainage systems
- Switch cropping activities to aquaculture

Uncertainty

- Financial resources
- Environmental hazards
- The farmers may not be able to change their carrier.
- The required knowledge may not be ready or available.
- The capacity of the fish industry could be limited to handle the production.
- The environmental impacts of this measure are highly uncertain.

Summary

National Level

- Changing cultivars
- Changing crop pattern
- Gradual switching of the current old land by reclaimed land in Upper Egypt
- Establishing adaptation tax on crops prices (less than 2% of the price).

Uncertainty

- Scientific knowledge limitations
- Physiological limits
- Food security constrains
- Inhabitants' national distribution balance.
- Farmers' income.
- Financial resources
- National income per capita.
- Standard of living.
- Marketing constrains.
- The available land resources for reclamation in Upper Egypt, and the required water resources for reclamation and production.
- The required fund for adaptation may exceed the level of adaptation tax.



Thank you

