An Economic Production of Keitt Mango under Protected and Open Field Conditions

Assem A. A. Mohamed, PhD.
Associate Professor, CLAC- ARC

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Outline

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Introduction

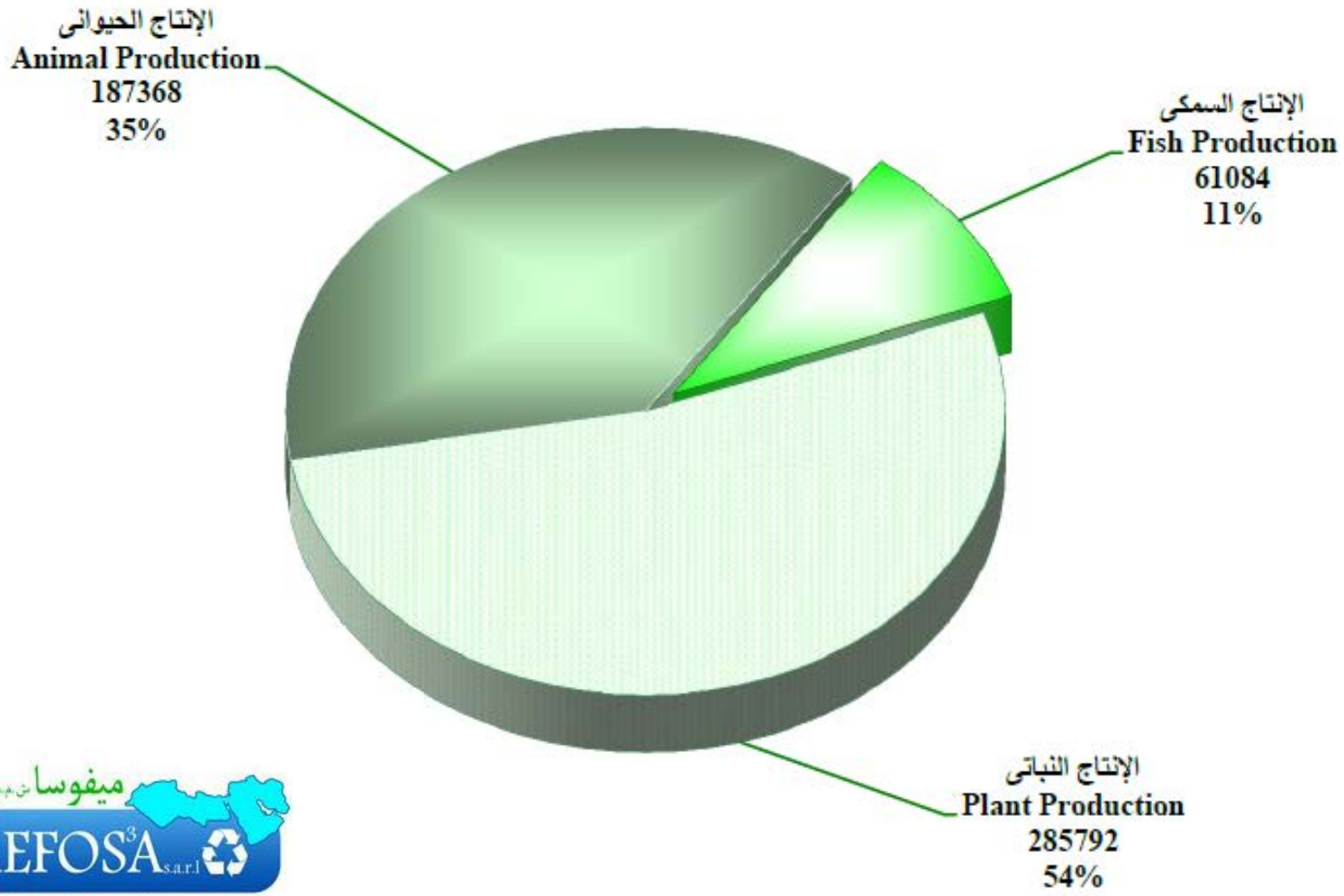
World Mango Profile

- Mango is acknowledged as the king of fruits.
- Mango is widely planted in the tropics and subtropics for its economic and nutritional values.
- It is the fifth most cultivated fruit in the world.
- Total world mango production is more than 55 million tonnes, (FAO, 2019).
- FAO- Global average is 3.5- 4 tonnes/ acre.

Egyptian agriculture sector in Figures in 2019

- Total cultivated area was 9.3 million fed.
- Total cropped area was16.3 million fed.
- Total value of **agricultural production** was LE 534.2 billion.
- Total Value of Agricultural Inputs was LE 187.8 billion.
- Net Agricultural Income was LE 346.4 billion.

Figure 1. Total value of Egyptian agricultural at current farm prices in 2019 (LE Million)



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Domestic Mango Profile, 2019

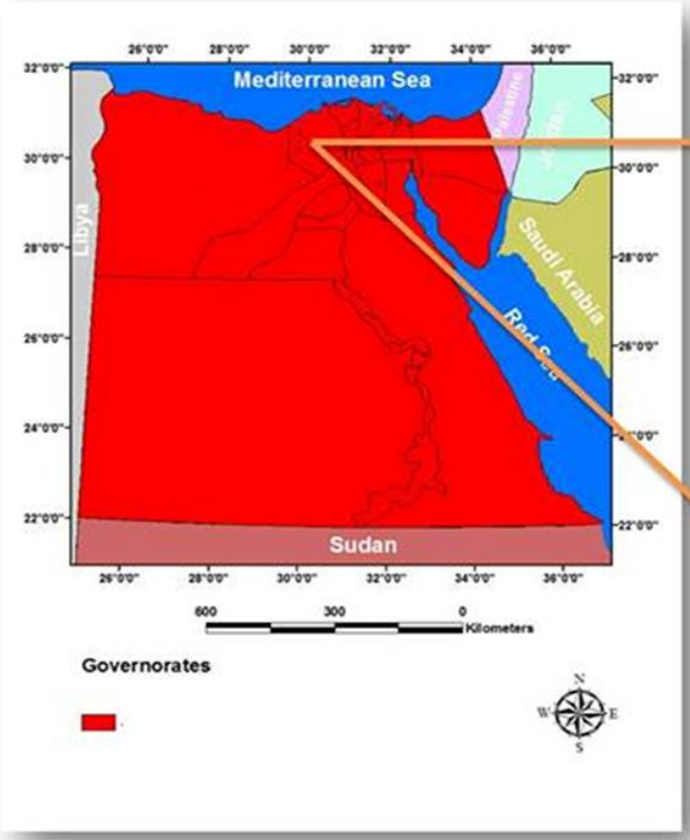
- Total area of fruits was 1,62 million fed (4200 m^2)
- Mango total area was 304,118 fed (18.8%).
- Mango fruitful area was 265,509 fed.
- Average yield was 4.11 tonne/ fed.

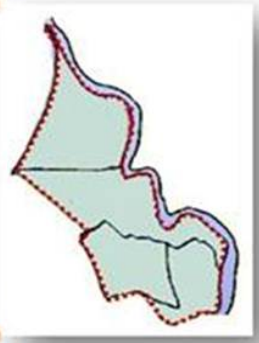
- The key objective of the present study was to achieve improving marketable yield, plantation profitability and environmental sustainability of mango crop.
- For achieving this objective, we have to develop the best practice production systems to minimise costs, maximise yields and optimise fruit quality improving marketable yield.

Materials and Methods

Figure 2. Location of the study area in Egypt

Study Area





Rashed Map

Beheira Governorate Map

Egypt Map

- Bossali unit of protected cultivation was used for the applied example to measure the efficiency of production, performance and revenue of Keitt mango during the period of 2007- 2021.
- A (50M x 200M) greenhouse structure of 10000 square meters was selected.
- The data collected was statistically analysed and converted to an economic profile of a typical greenhouse module.

- Descriptive analysis was applied to characterise the problem.
- Quantitative analysis method using some of the various measurements such as simple a general trend equations.
- Related data was based on annual data during the study period obtained from CAPMAS, MALR, FAOSTAT, USAD, etc.

Results

Table 1. Major producing countries of mango in the world (2019)

Countries	Production (million tonne)	% of world Production	Yield (tonne/ ha)	Harvested area (Th. ha)	% of world harvested area
India	25.63	45.9	9.97	2572.0	46.00
Indonesia	3.29	5.9	13.12	250.6	4.48
China	2.58	4.62	13.16	196.03	3.50
Mexico	2.40	4.29	11.11	215.98	3.86
Pakistan	2.27	4.06	10.56	214.8	3.84
Malawi	2.08	3.73	29.9	69.5	1.24
Brazil	2.00	3.58	22.35	89.45	1.6
Thailand	1.63	2.92	7.79	209.04	3.74
Egypt	1.47	2.63	10.84	135.52	2.42
Bangladesh	1.46	2.61	10.86	134.35	2.40
Global	55.85		10.00	5588.72	

Table 2. The constructing costs of a greenhouse on 10000 m^2 by local materials in 2007

Item	Value (LE)	Spam life (Years)	Depreciation (LE)
Wood (gazwarina trunk)	9600		
Iron and galvanization wire	18000		
Building materials	2400		
Construction cost	6000		
Total structure cost	**36000**	15	2400
Screen net	28750	5	5750
Total cost	**64750**		

Table 3. Total production costs of the cultivation of Keitt mango per hectare under screen net during the period of 2007- 2021

Cost items	Value (LE)	%	Notes
Structure cost	36000	8.91	
Screen net*	126500	31.32	
Seedling transplanting**	22176	5.49	1584 seedling per hectare
land preparation	1200	0.30	
Drip irrigation system	30000	7.43	
Production practices inputs	180000	44.57	Value of fertilizers, irrigation, manure, insecticides, pruning and labor wages
Maintenance	8000	1.98	
Total costs	**403876**	**100.00**	

*Screen net prices= LE 28750, LE 40250 and LE 57500 in 2007, 2012 and 2017 respectively

** Seedling price=LE 14

Table 4. Total production costs of the cultivation of Keitt mango per hectare in open field during the period of 2007- 2021

Cost items	Value (L.E.)	%	Notes
Seedlings transplant	22176	8.79	1584 seedling per hectare
Land preparation	1200	0.48	
Drip irrigation system	30000	11.89	
Production Practices inputs	195000	77.27	Value of fertilizers, irrigation, manure, insecticides, and labor wages
Maintenance	4000	1.58	
Total costs	**252376**	**100**	

Table 5. Economic Indicator of Keitt mango per hectare under the open field and screen net during the period of 2007- 2021

Indicators	Open field	Screen nets
Total production (tonne/hectare)	163152	288684
Total cost (LE)	252376	403876
Total revenue (LE)	1883376	3416688
Net return (LE)	**1,631,000**	**3,012,812**

Table 6. Profitability of Keitt mango for one year, comparison of net screen with open field

No.	Particulars	Keitt mango	
		Open field	Screen net
1	Area (ha)	1	1
2	Yield (tonne/ ha)	10.87	19.25
3	Yield (kg/ m^2)	1.08	1.9
4	Annual production cost (LE / ha)	16,825	26,925
5	T. Revenue (LE / ha)	125,558	227.779
6	Net income (LE)	108,733	200,854

Conclusions

- The study seeks to provide decision-makers and different stakeholders with a knowledge to development of orchard planted up to 1600 trees per ha.
- The development of high-density plantings is dependent on the use of **dwarfing cultivars** and/or **rootstocks** and **better canopy management** systems than currently employed.
- Production costs can be reduced especially costs of agricultural operations and marketing.

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Thank you !

CONTACT:

Assem A. A. Mohamed, PhD
Email: assem20000@yahoo.com
Mobile: +201118849915