UNIVERSITI PUTRA MALAYSIA

COMPARATIVE ADVANTAGE AND COST OF ACHIEVING SELF-SUFFICIENCY FOR VEGETABLES AND FRUITS IN THE SULTANATE OF OMAN

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COMPARATIVE ADVANTAGE AND COST OF ACHIEVING SELF-SUFFICIENCY FOR VEGETABLES AND FRUITS IN THE SULTANATE OF OMAN

By

NASSER ALI MUSALLAM BAITSAID

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirement for the Degree of Doctor of Philosophy

December 2006

UPM

DEDICATED

I dedicated this dissertation to all members of my family, who have supported and encouraged me to do my Ph.D A special dedication, with the beautiful flowers in this world and warm kisses, goes to my beloved father and mother, who scarified a lot to see me and my brothers educated and become successful in our lives. *"May Allah forgive me and my parents, grant them mercy as they have raised me since I was youthful, reward their good deeds with bounty, pardon their sins and grant them forgiveness"… Amen.*

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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Chairman : Associate Professor Zainal Abidin Mohamed, PhD

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The Sultanate of Oman has not achieved self sufficiency in the production of vegetables and fruits. This situation is due to the rapid growth in population that leads to a tremendous increase in the demand for these commodities and this deficit can only be sustained by imports. However, an increase in imports requires the use of more foreign exchange, which could otherwise be used for the importation of other important commodities. The expansion of domestic production would entail increasing the use of domestic resources thus raising the competition for the use of these resources. Therefore, the objective of this study is to determine the level of comparative advantage that Oman has for the different types of fruits and vegetables and the cost of producing these crops that will lead towards self-sufficiency in the country.

Secondary data on the production of vegetable (tomatoes, cucumber, pepper, watermelon, melon and cabbage) and fruit crops (dates, lemon and banana) were

collected from various government sources for the years 2000 to 2004. In order to estimate the cost of self-sufficiency this study analysed data on government intervention through the Nominal Protection Rate (NPR) and the Effective Protection Rate (EPR). The level of comparative advantage was analysed by using the domestic resource cost (DRC), resource cost ratio (RCR), net economic benefit (NEB) and social cost benefit (SCB) ratios.

Based on the analysis of this research, the study found out that the country is self-sufficient only in pepper and dates while for the other selected crops the level of self-sufficiency was varied. The cost of achieving self-sufficiency for selected crop was estimated between R.O. 118,517 and R.O. 3,648,636 for the period under consideration. Additionally, government intervention on vegetable and fruit production showed that the average NPR of vegetables production under the import substitution regime ranged between 11% and 39% for vegetables and between 15% and 17% for fruits; whereas the average EPR ranged between 92% and 132% for vegetables and between 47% and 105% for fruits. Moreover, the RCR value of vegetable and fruit production generally showed that the country had a comparative advantage in the production of most of the crops to enable import substitution with the exception of lemon which recorded an RCR value of more than 1. This finding emphasised that through import substitution and an increase in domestic production, the Sultanate of Oman could save or earn foreign exchange.

This study recommends that the government should strongly promote and encourage farmers to expand the production of selected crops to achieve self-sufficiency and maintain the position of comparative advantage for the crops mentioned in this study.

Abstrak tesis yang dikemukakan kepada Senat Univesiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

KELEBIHAN BERBANDING DAN KOS UNTUK MENCAPAI TAHAP SARA SAYURAN BUAHAN DI KESULTANAN OMAN

Oleh

NASSER ALI MUSALLAM BAITSAID

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Pengerusi : Professor Madya Zainal Abidin Mohamed, PhD

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Kesultanan Oman masih belum memenuhi sara diri dalam pengeluaran sayur-sayuran dan buah-buahan. Ini adalah kerana peningkatan populasi yang pantas yang seterusnya menyumbang kepada peningkatan permintaan untuk tanaman sayur-sayuran dan buah-buahan, dan defisit ini hanya boleh diatasi dengan pengimportan. Walaubagaimanapun, kadar kenaikan dalam pengimportan memerlukan lebih banyak tukaran wang asing, di mana ia boleh digunakan untuk komoditi import yang lain. Pengembangan pengeluaran melibatkan peningkatan penggunaan sumber-sumber domestik sekaligus menaikkan persaingan dalam penggunaan sumber-sumber ini.

Kajian ini menggunakan data sekunder dari beberapa sumber untuk tahun di antara 2000 dan 2004. Enam jenis tanaman sayur-sayuran (tomato, timun, lada, tembikai, tembikai susu dan kobis) dan tiga jenis tanaman buah-buah-buahan (kurma, limau dan pisang) telah dipilih untuk kajian ini. Dasar campur tangan perlindungan kerajaan dianggarkan menggunakan kadar perlindungan nominal (NPR) untuk output pasaran dan kadar perlindungan efektif untuk pasaran output dan input. Untuk menilai sama ada sayur-sayuran dan buah-buahan tersebut efisien dan mempunyai daya saing untuk gantian import, kos sumber domestik (DRC), nisbah kos sumber

(RCR), jumlah faedah ekonomi (NEB) dan faedah kos sosial (SCB) turut dianggarkan.

Berdasarkan analisis kos dan keuntungan dari prestasi pengeluaran komoditi kajian ini mendapati bahawa negara Oman mencapai tahap memenuhi sara diri bagi pengeluaran lada hitam dan korma tetapi untuk tanaman-tanaman yang lain tahap ini berbeza. Kos untuk mencapai tahap pemulihan sara diri bagi tanamaan yang lain dianggarkan antara R.O. 118,517 dan R.O.3,648,636 bagi tahun-tahun didalam kajian ini. Purata NPR pengeluaran sayur-sayuran di bawah gantian import adalah di antara 11% hingga 39%, manakala untuk pengeluaran buah-buahan adalah di antara 15% dan 17%. Purata EPR untuk pengeluaran sayur-sayuran di antara tahun 2000 hingga 2004 adalah di antara 92% hingga 1332%, di mana EPR untuk tanaman buah-buahan pula menunjukkan nilai tambah di antara 47% dan 105%. Secara amnya, nilai RCR pengeluaran sayur-sayuran dan buah-buahan menunjukkan Kesultanan Oman mempunyai kelebihan bandingan dalam pengeluaran kebanyakan tanaman untuk membolehkan gantian import dengan pengecualian limau di mana ia mencatatkan nilai RCR >1. Daya saing menunjukkan bahawa melalui gantian import, Kesultanan Oman boleh menyimpan atau memperolehi tukaran asing dengan memberi penekanan terhadap pengeluaran tempatan. Oleh itu, kerajaan disarankan supaya mempromosikan dan menggalakkan para petani untuk mengembangkan pengeluaran semua jenis sayuran yang telah dibincangkan dalam kajian ini untuk mencapai tahap memenuhi sara diri dan memperbaiki tahap daya saing..

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I am really grateful to the Ministry of Agriculture and Fisheries in Oman, which allowed me to complete my Ph.D programme and providing me with the needed data and information for my research.

I certify that an Examination Committee has met on 22nd December 2006 to conduct the final examination of Nasser Ali Musallam Baitsaid on his Doctor of Philosophy thesis entitled "Comparative Advantage and Cost of Achieving Self-Sufficiency for Vegetables and Fruits in the Sultanate of Oman" in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of Examination Committee are as follow:

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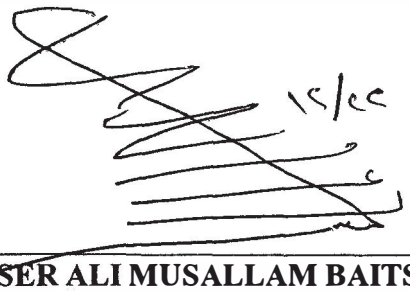
DECLARATION

I hereby declare that the thesis is based on my original work except for quotations and citations, which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or other institutions.



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LIST OF ABBREVIATIONS

R O	Rial Omani
GDP	Gross Domestic Product
GNI	Gross National Income
MT	Metric Tonnes
Ton	Tonne
Ha/ha	Hectare
HEIS	Household Expenditure and Income Survey
JICA	Japan International Cooperation Agency
GCC	Gulf Cooperation Council
GAFTA	Great Arabic Free Trade Area
WTO	World Trade Organization
FAO	Food and Agriculture Organisation
PAMAP	Public Authority for Marketing Agricultural Produce
NTB	Non-Tariff Barriers
NPC	Nominal Protection Coefficients
NPR	Nominal Protection Rate
EPC	Effective Protection Coefficients
EPR	Effective Protection Rate
ESC	Effective Subsidy Coefficients
PSE	Producer Subsidy Equivalents
CSE	Consumer Subsidy Equivalent
DRC	Domestic Resource Cost
NEB/NSP	Net Economic Benefit / Net Social Profitability
RCR	Resource Cost Ratio

HYV	High Yielding Variety
LDC	Less Developed Countries
UR	Uruguay
GATT	General Agreement Tariff and Trade
URAA	Uruguay Agreement Act
AMS	Aggregate Measurement of Support
TFPG	Total Factor Productivity Growth
SCB	Social Cost-Benefit
PAM	Policy Analysis Matrix
SER	Shadow Exchange Rate
PPF	Production Possibility Frontier
OER	Official Exchange Rate
FOP	Free On Board
CIF	Cost, Insurance and Freight
CF	Conversion Factor
AP	Accounting Price
MP	Market Price

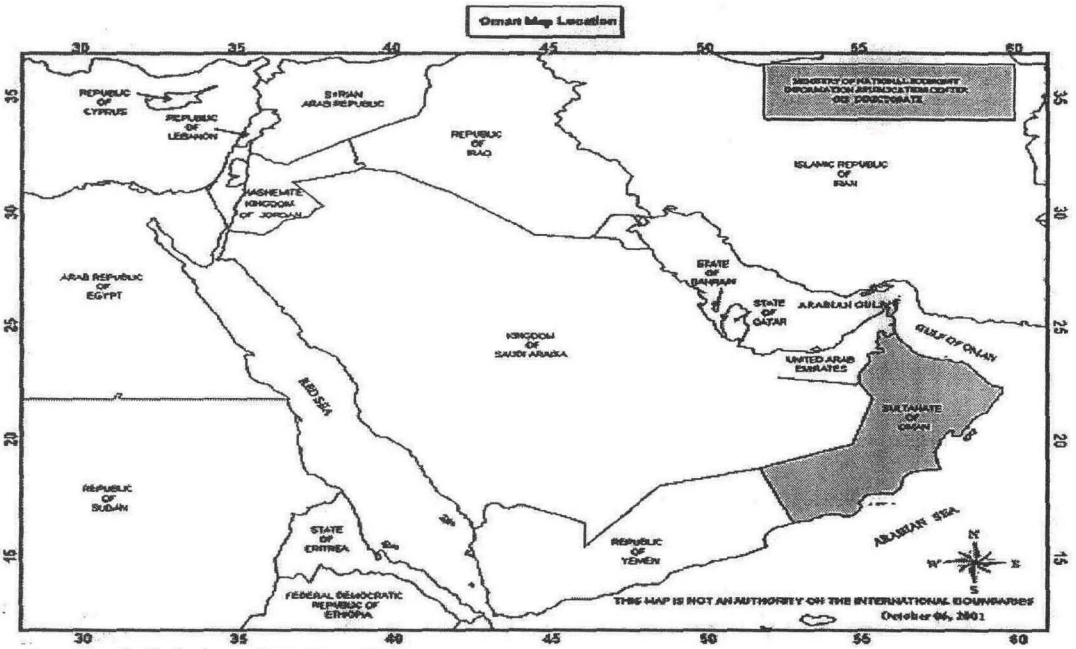
CHAPTER 1

INTRODUCTION

1.1 Background of the Sultanate of Oman

The Sultanate of Oman occupies the Southeastern corner of the Arabian Peninsula and is located between 16 40" and 26 20" North and Longitudes 51 50" and 59 40" East. The total land area is approximately 309,500 km^2. It shares borders with Yemen, Saudi Arabia and United Arab Emirates. The coastline is about 1,700km, which extends from the Strait of Hormuz (which is a vital Strait that a majority of the world's oil passes through) in the north, to the borders of the Republic of Yemen in the south and faces three seas, which are the Arabian Gulf, Gulf of Oman and the Arabian Sea.

Figure 1.1: A Map Describes the Location of the Sultanate of Oman



Source: Ministry of National Economy

Oman has a varied topography and climate, which differs from one area to another. In summer it is hot and humid in the coastal areas but it is hot and dry in the interior. However, the higher mountain areas enjoy a moderate climate throughout the year. Rainfall is generally light and irregular but occasional heavy rains and thunderstorms can cause severe flooding. In the south, the Dhofar region has a moderate climate and the pattern of rainfall is more predictable with heavy monsoon rains occurring regularly between May and September. Average temperatures for the north of Oman are 32-48 ^{0}C from May to September; 26-36 ^{0}C from October to April. Due to the monsoon season, from June to September, the Dhofar region in the south of the country maintains a fairly steady year-round temperature of around 30–35 ^{0}C. After the rains, Dhofar is transformed into a lush landscape of green fields and verdant vegetation. Average rainfall in the Muscat Region is 75mm. In the Jebel al Akhdar region, average rainfall ranges 250mm to 400mm. During the monsoon season in Dhofar an average rainfall of between 100- 400mm is recorded.

The Omani society consists of four basic categories of population; the fishermen of the the coastal areas which lives on fishing, seafaring and trading; the farmers of the coastal plains (Batinah and Salalah) and those of the interior; the herders of Dhofar and Musandam mountains and the Bedouins of the interior desert areas. The latest census carried out in December 2003 showed that the total population of Oman was 2,340,815 compared with 2,018,074 in December (Ministry of National Economy, 2004).

1.2 National Economy

Since the discovery of oil in 1967 Oman has had an oil-based economy, but it is subjected to the unpredictable change of the world price of crude oil. This was illustrated in 1986 when there was a sudden and violent slump in the international crude oil prices, necessitating an 11.3% devaluation in the value of the Rial Omani (R.O.), from R.O. 0.3454 to 0.3845 per USD. This unpredictability also created difficulties for forward budgeting. Although the world price of crude oil has made a considerable recovery since 1986, however, during the latter half of the 1980s it has ranged between USD 12 (1986) and USD 16 (1989), which was below the figure of USD 18 per a barrel, a comfortable value for the Omani economy. Recently, the Omani economy has developed positively due to the increase in the world price of oil, where the average price has remained at USD 23, USD24.29 and USD27.84 per a barrel for 2001, 2002 and 2003 respectively (Ministry of National Economy 2004). Consequently, the GDP increased from R.O. 7,670.42 (USD 19,943.1) in 2001 to R.O. 8,342.81 (USD 21,697.82) in 2003 (see Table 1.1).

Table 1.1 also illustrates that there was a decline in the contribution of the agricultural sector to the GDP, estimated at 1.8%, 1.3%, 1.39%, 1.35% and 1.27% in 1999, 2000, 2001, 2002 and 2003 respectively.

Table 1.1: The Development of Total Gross of Domestic Production (Petroleum and Non- Petroleum Activities) in Rial Omani of Sultanate of Oman from 1999 to 2003

Economic Activity	1999		2000		2001		2002		2003	
	(%)	Value	(%)	Value	(%)	Value	(%)	Value	(%)	Value
1- Total Petroleum Activities	39.20	2,365.80	48.70	3,717.70	42.56	3,264.40	41.87	3,269.12	41.19	3,436.56
2- Total Non Petroleum Activities	62.70	3,789.70	53.40	4,079.40	59.38	4,555.05	60.26	4,704.47	60.81	5,073.28
2.1 Agriculture & Fishing	2.60	159.00	2.00	149.40	2.05	157.28	2.03	158.41	1.95	162.68
A - Agriculture	1.80	106.70	1.30	100.70	1.39	106.26	1.35	105.29	1.27	106.05
B - Fishing	0.90	52.30	0.60	48.70	0.67	51.01	0.68	53.12	0.68	56.62
2.2 Industry Activities	8.10	490.70	8.60	655.40	11.71	898.43	11.15	870.63	12.06	1,006.02
2.3 Services Activities	52.00	3,140.00	42.90	3,274.70	45.62	3,499.35	47.08	3,675.43	46.80	3,904.58
GDP at Producers Prices	98.70	5,960.30	99.40	7,593.10	99.24	7,611.84	99.23	7,746.79	99.22	8,277.83
Plus : Import Taxes	1.30	8.30	0.60	46.10	0.76	58.58	0.77	60.25	0.78	64.98
GDP at Market Prices	100	6,040.60	100	7,639.20	100	7,670.42	100	7,807.04	100	8,342.81

Source: Ministry of National Economy, 2000-2004.