UNIVERSITI PUTRA MALAYSIA

SUPPLY RESPONSE OF SELECTED CROPS IN BANGLADESH

MOHAMMAD ISMAIL MIA

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By

MOHAMMAD ISMAIL MIA

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in fulfilment of the Requirements for the Degree of Master of Science

May 2012

DEDICATIONS

Dedicated to my parents,

To my brother and sister

To my wife Ayesha Siddika

And

All those individuals who behind the scene make me possible

to complete my study successfully.

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirements for the degree of Master of Science

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Chairperson : Professor Fatimah Mohamed Arshad, PhD

Institute : Institute of Agricultural and Food Policy Studies

Bangladesh is one of the most populous countries in the southern part of Asia with a population density of 1074 person per square kilometre. Agriculture contributes about 21% to the country's GDP and employs over 48% of the total labour force in 2010. Jute, sugarcane, lentil and mustard are important crops. Jute and sugarcane are cash crops. Lentil is a popular pulse crop considered as poor man's protein. Mustard is an oil crop. Area and production of all these are declining while their imports, poverty and unemployment are in rise. The objective of this study is (i) to determine the growth rates of area and production of jute, lentil, mustard and sugarcane; (ii) to estimate the supply responsiveness of these crops to change in price and non price factors; and (iii) to compare the acreage response of these four crops. The study utilised a simple calculation of growth rate on margin residuals such as area and production and also estimates acreage responsiveness of these crops to change in price and non price factors use of Johansen cointegration aopproach and vector error correction model (VECM) using data1980/81-2007/08.

Area growth rates of jute were negative for all the sub periods as well as for the whole period. Jute production also grew negatively. Lentil area grew negatively while its production grew positively. Growth rates of both area and production of mustard and sugarcane were negative during the last 28 years period.

The short-run elasticity of jute acreage is 0.5463 while in the long-run it is 1.2941. Jute growers make considerable area adjustments in the short-run and long-run in response to its own price. Coefficient of *aus* price was negative. Weather appeared to have positively influenced jute acreage.

Short-run and long-run acreage elasticity of lentil with respect to its price is 0.2296 and 0.3628 respectively suggesting that lentil growers do not make considerable area adjustments in response to price of the crop. Weather variable did not appear to have shown any influence on lentil area in the short-run. The short-run and long-run elasticities of area with respect to mustard price is 0.2403 while in the long-run, the real mustard price elasticity is 0.6398. In terms of sugarcane, the short-run and long-run elasticities of sugarcane area with respect to its real price are 0.1990 and 0.6731 respectively. Low short-run and long-run elasticities of these crops trend to make minimum area adjustment in response to their expected prices.

The study simples that the area allocation decision of the farmers does not only depend on price of the product, a set of other factors such as improved technology, ensuring input delivery, providing support price, providing extension services and preventing force to artificially control prices are also necessary. Hence, in a land

scarce country like Bangladesh, a comprehensive set of policy is required to provide economic incentives that will induce producers and other industry participants to invest above on the said sectors.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Master Sains

TINDAK BALAS PENAWARAN TERHADAP TANAMAN PILIHAN DI BANGLADESH

Oleh

MOHAMMAD ISMAIL MIA

Mei 2012

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Bangladesh merupakan salah satu negara yang mempunyai ramai penduduk di selatan Asia dengan ketumpatan populasi sebanyak 1074 orang per kilometer persegi. Pertanian menyumbang sebanyak 21% kepada GDP negara dan menggunakan lebih 48% jumlah tenaga kerja pada 2010. Jerami, tebu, kekacang dan biji sawi adalah tanaman yang juga penting. Jerami dan tebu adalah tanaman kontan. Manakala kekacang adalah nadi tanaman yang popular yang di anggap sebagai protein kepada orang miskin. Biji sawi adalah tanaman minyak. Kawasan dan pengeluaran terhadap kesemua jenis tanaman ini menurun sementara kadar import, kemiskinan dan pengangguran meningkat. Objektif kajian ini adalah (i) Menentukan kadar pertumbuhan kawasan dan pengeluaran jerami, kekacang, biji sawi dan tebu; (ii) Untuk menganggar tindak balas penawaran terhadap tanaman untuk perubahan dalam harga dan faktor-faktor bukan harga; dan (iii) Untuk membandingkan tindak balas keluasan terhadap empat jenis tanaman ini. Kajian ini menggunakan pengiraan mudah terhadap kadar pertumbuhan ke atas sisa margin seperti keluasan dan pengeluaran dan juga menganggar tindak balas keluasan terhadap tanaman untuk

perubahan dalam harga dan faktor-faktor bukan harga menggunakan “Johansen cointegration” dan “vector error correction model” (VECM) menggunakan data 1980/81-2007/08.

Kadar pertumbuhan kawasan jerami adalah negatif pada semua sub tempoh begitu juga untuk kesemua tempoh kajian. Pengeluaran jerami juga berkembang secara negatif. Kawasan pertumbuhan kekacang adalah negatif sementara pertumbuhan pengeluaran adalah positif. Kadar pertumbuhan untuk kedua-dua kawasan dan pengeluaran biji sawi dan tebu adalah negatif sepanjang tempoh 28 tahun yang lepas.

Keanjalan keluasan jangka pendek jerami adalah 0.5463 manakala dalam jangka panjang adalah 1.2941. Penanam jerami membuat pertimbangan dalam pelarasan kawasan dalam jangka pendek dan jangka panjang dalam tindak balas terhadap harganya sendiri. Pekali terhadap harga *aus* adalah negatif. Cuaca menunjukkan kesan positif terhadap keluasan jerami. Keanjalan keluasan jangka pendek dan jangka panjang kekacang dengan harga adalah 0.2296 dan 0.3628 masing-masing mencadangkan bahawa penanam kekacang tidak membuat pertimbangan pelarasan kawasan dalam tindak balas harga terhadap tanaman. Pembolehubah cuaca tidak menunjukkan sebarang pengaruh ke atas kawasan kekacang dalam jangka pendek. Keanjalan keluasan jangka pendek dan jangka panjang dengan harga biji sawi adalah 0.2403 manakala dalam jangka panjang, keanjalan harga sebenar biji sawi adalah 0.6398. Manakala bagi tebu, keanjalan jangka pendek dan jangka panjang kawasan tebu dengan harga sebenar adalah 0.1990 dan 0.6731. Keanjalan yang rendah dalam jangka pendek dan jangka panjang terhadap aliran tanaman ini menjadikan pelarasan kawasan yang minimum dalam tindak balas terhadap harga jangkaan.

Hasil kajian menyimpulkan bahawa peruntukan kawasan yang di buat oleh petani tidak hanya bergantung kepada harga produk, tetapi faktor-faktor lain seperti kemajuan teknologi, memastikan penyampaian input, menyediakan harga sokongan, menyediakan perkhidmatan sambungan dan desakan kawalan terhadap harga kawalan juga di perlukan. Oleh itu, negara yang mempunyai tanah yang terhad seperti Bangladesh, satu komprehensif polisi diperlukan untuk menyediakan insentif ekonomi yang boleh menyuntik pengeluar dan lain- lain industri mengambil bahagian untuk melabur dalam sektor tersebut.

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I certify that a thesis Examination Committee has met on 24 May, 2012 to conduct the final examination of Mohammad Ismail Mia on his thesis entitled "Supply Response of Selected Agricultural Crops in Bangladesh" in accordance with the Universities and University Colleges Act 1971 and Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The committee recommends that the student be awarded the Master of Science.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfillment of the requirement for the degree of Master of Science. The members of the supervisory committee were as follows:

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DECLARATION

I declare that the thesis is my original work except for quotations and citations, which have been properly acknowledged. I also declare that it has not been previously, and is not concurrently, submitted for any other degree at Universiti Putra Malaysia or at any other institution.

MOHAMMAD ISMAIL MIA

Date: 24 May 2012

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