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ENERGY COSTS: IMPACT ON THE VALUE CHAIN OF AGRICULTURE AND FOOD PROCESSING



Inma
AGRIBUSINESS PROGRAM

January 08, 2009

This report was produced for review by the U.S. Agency for International Development (USAID).
It was prepared by Franco Scotti for a consortium led by The Louis Berger Group, Inc.

Contract No. 267-C-00-07-00500-00

JANUARY 2009

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Macro-Economic Distortions to Competitiveness of Iraqi Agriculture¹

Two decades ago, a flourishing commercial agriculture in Iraq supplied both domestic and export markets. In contrast, the sector now is characterized by low output and productivity, weak or non-functional supply and product value chains, and major loss of market shares for foodstuffs. With strong backing by their respective governments, producers in neighboring countries have absorbed increasing market shares of foodstuffs demanded by Iraqi consumers, including perishable foodstuffs for which Iraqi producers previously enjoyed a significant comparative advantage.²

Today, diminished violence, increased political stability and growing consumer incomes are translating into steadily expanding perishable foodstuffs consumption by Iraqis. In order to capture this expanding market, Iraqi agriculture³ must be able to compete with producers in neighboring countries, who benefit from numerous public subsidies and export promotion policies.

For Iraqi agriculture to compete in Iraqi markets, a two-pronged approach is required. Private sector producers and agribusiness enterprises must invest in technological and managerial modernization to achieve productivity levels and value chain transactional efficiencies equivalent to those of neighboring competitors. Additionally, the Government of Iraq (GoI) must take urgent steps to achieve a greater equivalence (i.e., parity) of macro-economic conditions faced by Iraqi agriculture as compared to neighboring competitors. In other words, the GoI must carry out infrastructure investments and adopt macro-economic policies to assure that Iraqi farmers and agribusinesses are competing on a more level macro-economic playing field with farmers and agribusinesses in surrounding countries.

This paper discusses four critical areas of the national macro-economic infrastructure and policy environment that must be addressed by the GoI to achieve a competitive equivalence for Iraqi agriculture: 1) Security Risks; 2) Energy Costs; 3) Cost (Opportunity Cost) of

¹ As compared to neighboring countries exporting agricultural products to Iraq, Iran, Jordan, Saudi Arabia, Syria and Turkey.

² An enquiry conducted by the USAID/*Izdihar* program among the main Baghdad wholesalers showed that there were limited imports of fruits and vegetables in 2006 during the Iraqi out-of-the season production windows.

³ The term "Iraqi agriculture" is used here to refer to all commercial activities throughout the various agricultural product value chains, from the production inputs supply chain through agricultural producers to final foodstuffs consumers.

Investment Capital; and, 4) Currency Value Distortions/Exchange Rate Policies. These are summarized below.

SECURITY RISKS

Although security risks are diminishing, Iraqi farmers and agribusinesses continue to face significantly higher security risks than do neighboring competitors. It is estimated that Iraqi investors discount potential returns to production and agribusiness investments by 30-50% because of current security risks, whereas in neighboring countries, there is little or no discount for security risks. Without publicly funded mechanisms to offset these risks, private sector agricultural production and agribusiness investments in Iraq will continue to lag.

ENERGY COSTS

For many agribusiness operations related to processing and marketing, lack of reliable grid electricity requires private investment in the purchase and operation of stand-by generators. This results in extraordinary costs that Iraqi agribusinesses must pay for electricity, as compared to their neighbors. Costs are particularly high when the “hidden costs” of using diesel generators are, such as maintenance are taken into account (see Tables A and B).

Although Iraq and neighboring countries all heavily subsidize grid electricity, unlike its neighbors who provide reliable grid electricity 24/7, grid electricity in Iraq is available sporadically (often less than four hours daily), requiring agribusiness owners to privately generate 25-75% of their total electricity requirements. And they usually must rely on imported fuel, usually purchased at open market prices. Additionally, for agribusiness operations requiring high amounts of thermal energy (e.g., many types of food processing), Iraq must rely on imported diesel or heavy fuel to heat boilers, generate steam, etc. While its neighbors generate thermal energy from cheaper and more efficient natural gas, Iraq’s plentiful supply of natural gas is burned off at the well-head.

Iraq’s high energy costs impose extraordinary costs on many agriculture related operations, such as irrigation water pumping, resulting in a significant negative impact on the cost of irrigation (within the range of \$140-\$440/ha). Although this often is a public cost, it nevertheless represents an extra private or social cost of 2.1 to 7.8 %, as compared to neighboring countries, i.e., Turkey, Syria, Jordan and Iran (See Table C).

High energy costs also have a significant negative impact on the economic feasibility of privately operated cold storage facilities (that must be run on diesel generators in Iraq), especially for crops requiring extended storage such as potatoes, onions, carrots and many fruits, to extend the marketing window. (See cost comparisons in Table D).

High costs of energy in Iraq (electrical and thermal) significantly and specifically impact negatively on Iraqi competitiveness in food processing, as compared to Iran, Syria and GCC countries (for example, in dairy, tomato paste, biscuits, meat & poultry, frozen fruit, juices from concentrate, and oilseed refining. Iraqi production in these sectors cannot be competitive at current Iraqi agro-industry energy costs (See Table E).

OPPORTUNITY COST OF INVESTMENT CAPITAL

Central Bank of Iraq (CBI) interest rate policies in effect provide a no- interest paid on CBI deposits. Central banks in neighboring countries do not offer this no-risk option to depositors. This translates into relatively higher interest rates on commercial lending in Iraq, as well as severely restricted availability of both debt and equity/venture capital for agribusiness investment, as compared to neighboring countries.

This seriously dampens and crowds out potential investment in agribusinesses, that under normal circumstances are considered to be relatively low risk, and with modest returns. High interest rates have also a high negative impact of seasonal industry such as tomato paste for instance that required high working capital due to the narrow period of processing.

High interest rates are crowding out export of dates (the only sizeable agricultural export of Iraq) since traders are unwilling to immobilize liquidity in exports operations less profitable than deposits at the central bank.

CURRENCY VALUE DISTORTIONS/EXCHANGE RATE POLICIES

CBI exchange rate policies result in increased costs and decreased returns (in dollar terms) to Iraqi agribusinesses that seek to compete in Iraqi markets with export agribusinesses in neighboring countries. For example, from 2004 to 2008, these policies resulted in a 35% overvaluation of the Iraqi dinar as compared to Iranian currency, and by over 18% as compared to the Syrian currency (See Table F).⁴

⁴ The model has been developed by APEX-Brazil (Brazilian Export Promotion Agency) in 2007 with the specific objective to measure Brazilian currency over-under valuation with respect to the currency of any important trade partners, including the countries in the Middle East that are important export markets for Brazil (sugar, poultry, orange juice, confectionery). The model has been developed with the assistance of the EU funded projects PAIPME and the collaboration of The Economist Intelligence Unit with the University of Utrecht. The model is fundamentally based on the distinction between real exchange rate and nominal exchange rate. A component of inflation derived from inflation differential in the selected countries is discounted from the nominal exchange rate (better known as PPP methodology). A factorial and multi-regression analysis evaluates the impact of some factors (called legitimate) such as the current account balance of payment and productive Foreign Direct Investment on the real exchange rate. The amount of real exchange rate “not explained” by any factor, the residual is considered as over-under valuation. The model applied to the Iraqi currency has a margin error of $\pm 30\%$, a more accurate estimate would require the payment of royalties on the patented model.

Conclusions

Given the above-described distortions to a level macro-economic playing field, Iraqi farmers and agribusiness are at a severe competitive disadvantage *vis-a-vis* their competitors in neighboring countries. And since Iraqi importers routinely charge a 20 – 25% commission on imported agricultural products, these distortions are not offset by significant price benefits to the Iraqi consumer. Thus, all Iraqis lose, and Iraq's neighbors gain.

REFERENCE TABLES

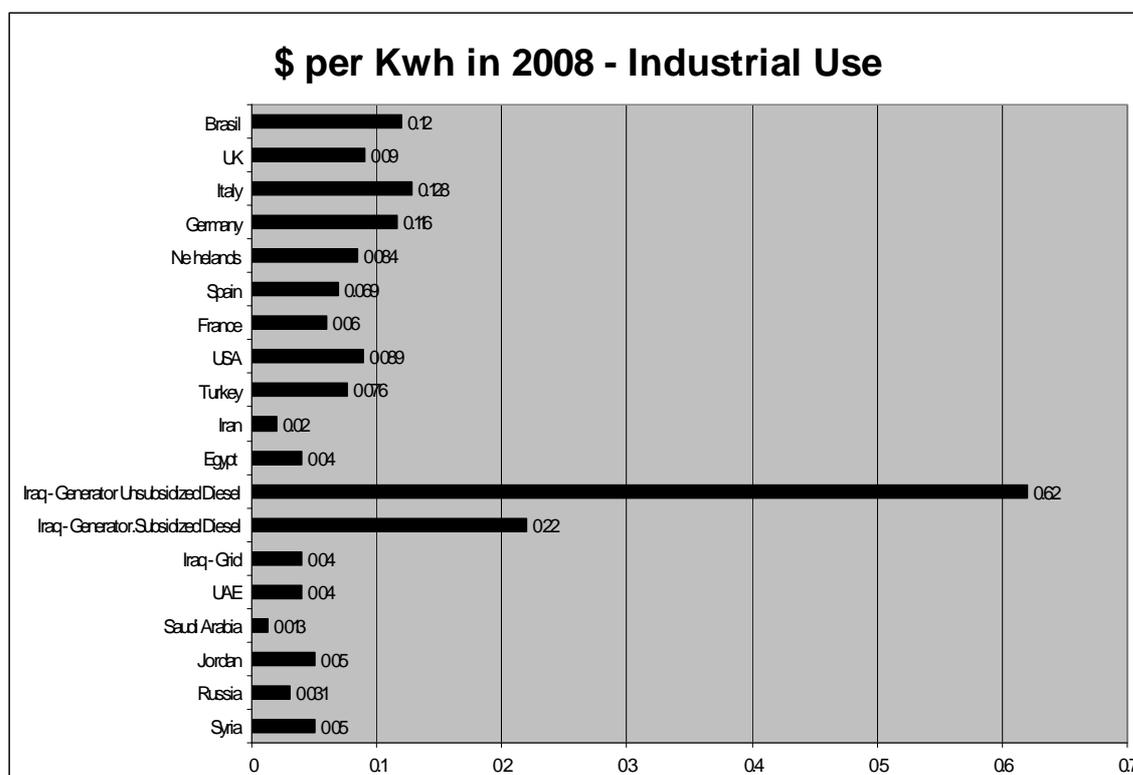


TABLE A. COSTS OF ELECTRICITY - INDUSTRIAL RATES - SELECTED COUNTRIES -2008.
Source: IEA

Energy Cost Iraq vs. Other Countries in \$	Iraq	Iran	Syria	UAE	Turkey	Saudi Arabia
Electricity kWh	0.04 (Grid) 0.22 (Subsidized diesel) 0.62 (Open market diesel)	0.02	0.05	0.04	0.076	0.013
Thermal Energy (MBtu)	5.26 (Fuel oil)	0.30	1.22	0.85	1.52	0.75
Diesel/Liter	0.2 (Subsidized) 0.7 (Open market) 0.9 (Open market peak time – summer)	0.015	0.24	0.62	1.25	0.088
Transportation Cost \$/km/MT	0.082	0.011	0.034	0.055	0.145	0.019

**TABLE B. COMPARISON OF ENERGY AND TRANSPORT COSTS -
IRAQ AND SURROUNDING COUNTRIES - 2008.**

Source: Gulf News, IEA, Gondrand International, USAID//Inma Agribusiness Program

Irrigation Costs \$/ha	kWh/ha	\$ kWh	\$/kWh/ha
Iraq Grid	1,060	0.04	42.4
Iraq Generator (Subsidized Diesel \$0.20/Lit)	1,060	0.22	233.2
Iraq Generator (Subsidized Diesel \$0.20/Lit)	1,060	0.62	657.2
Jordan	472	0.05	23.6
Syria	632	0.05	31.6
Turkey	548	0.08	41.6
Iran	780	0.02	15.6

TABLE C. ELECTRICITY COSTS FOR IRRIGATION IN IRAQ AND SURROUNDING COUNTRIES-2008.

Source: Icarda, *Inma* assisted program data (Rashidiya)

Cost of Cold Storage 2 to 5°C	Iraq Grid Electricity kWh \$ 0.04	Iraq Generator with Subsidized Diesel in \$ (\$0.2/lit) kWh \$ 0.22	Iraq with Market Price Diesel in \$ (\$0.8/lit) kWh \$0.62	Iran kWh \$0.02	Syria kWh \$ 0.05	Jordan kWh \$ 0.05	Saudi Arabia kWh \$0.013
Cold Storage \$/m ³ @120 kWh/m ³ /year	4.8	26.4	74.4	2.4	6.0	6.0	1.56
Cold Storage \$/MT basis - @365kWh/MT/year	14.6	80.3	226.3	7.3	18.2	18.2	4.74

TABLE D. ELECTRICITY COSTS FOR COLD STORAGE – SELECTED COUNTRIES - 2008

Source: *Inma* Engineering, Eismann Italy, RFID Consulting

Energy Cost per produced (\$/MT) Sector	Cost ton by	Iraq - Energy Cost per ton 1/3Grid-1/3Diesel Sub.-1/3 Diesel Unsubsidized Fuel oil Sub.	Δ Vs. Iran Cost \$/MT	Δ Vs. Syria Cost \$/MT	Δ Vs. Saudi Arabia Cost \$/MT	Δ Vs. Brazil \$/MT	Δ Vs. Turkey \$/MT
Dairy							
Milk - Dairy Farm		0.64	0.59	0.53	0.61		0.47
Milk - Collection		30.49	28.39	25.24	29.13		22.51
Processing - Pasteurized Milk		65.56	61.16	53.74	61.76		48.16
Processing - UHT Milk		101.19	94.33	83.18	95.71		74.44
Processing Yoghurt		90.45	84.32	74.42	85.65		66.57
Milling							
Wheat Flour		60.09	56.00	49.54	57.07		44.27
Rice		14.34	13.40	11.62	13.29		10.47
Bakery							
Bread and Industrial Bakery		52.71	49.28	42.58	48.63		38.43
Biscuit		75.23	70.32	60.92	69.65		54.93
Extruded Snacks		38.92	36.25	32.19	37.12		28.72
Fruit/Vegetable							
Fruit & Vegetable Canning		34.51	32.28	27.81	31.72		25.13
Fruit Juice 15° Brix (not concentrated)		23.65	22.14	19.00	21.64		17.20
Frozen Fruit		185.44	172.75	153.11	176.47		136.73
Frozen Concentrated Juice 65 ° Brix		202.12	188.59	165.32	189.80		148.31
Frozen Potatoes		187.61	174.78	154.86	178.47		138.31
Tomato Paste		63.48	59.47	50.75	57.70		46.05
Ketchup		62.41	58.22	51.15	58.77		45.84
Tomato Puree		66.96	62.44	54.99	63.24		49.23
Pickles		80.33	74.90	65.95	75.83		59.05
Oilseeds (Extraction)							
Mechanical Extraction		81.73	76.11	67.64	78.03		60.33

Mechanical + Chemical Extraction	56.63	52.81	46.44	53.38		41.61
Meat						
Poultry	112.94	105.21	93.26	107.49	77.97	83.28
Beef	118.27	110.20	97.52	112.35		87.14

**TABLE E. ENERGY COSTS FOR SELECTED FOOD PROCESSING
ACTIVITIES IN IRAQ COMPARED TO SELECTED COUNTRIES - 2008**

Source: Danone Group, Unilever and Nestle

Iraqi Dinar Estimated Over Valuation	Estimate Exchange Over-Under of the Iraqi Dinar in % at the end of 2008	Real Rate	Estimate Exchange Rate Under valuation of the Iraqi Dinar in % in the Period 2004-2008	Real Rate Over- Under	Nominal Exchange Appreciation of the Iraqi Dinar versus other currencies in % 2008 vs. 2004
vs. Iranian Rial – Iran	+35.6.		+35.6.		+47.6
vs. Syrian Pounds – Syria	-18.6		+18.6		+7.3
vs. Turkish Lira – Turkey	-7.2		+42.8		+29.1
vs. Jordanian Dinar - Jordan	-18.0		+52.0		+18.5
vs. Brazilian Real - Brazil 2008 vs. 2007	+35.6		na		35.6

**TABLE F. ESTIMATED OVERVALUATION OF IRAQI DINAR - COMPARED TO MAJOR
AGRICULTURAL IMPORT COMPETITORS - 2008**

Source: APEX – Brazil Methodology Economist Intelligence Unit and Utrecht University PAIPME
Program