Does Small Farmer Investment In Bananas Jeopardize Macroeconomic Stability In Yemen?

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Abstract

If a small farmers' initiative is undertaken, it could be ineffective or negligent at the national level. The argument that private investment makes stabilization policy difficult or even ineffective will be examined through small farmer decisions in producing bananas instead of mangoes in several governorates in Yemen. Data indicate that the total production cost per hectare of bananas amounted to 647,000 Yemeni Rail (YR), total income is 1.4 million YR and net income is 750,000 YR. Mango data indicate that the total production cost per hectare amounted to 518,000 YR, and total income is 5.5 million YR and net income is 5.0 million YR. The internal rate of return for bananas is 52% and for mangoes 71%.

Introduction

Water is scarce and vital to all aspects of development in Yemen. The availability of water is the major constraint for drinking water and agricultural production. The total annual renewable amount of water resources in Yemen is estimated at 2.5 billion m^3. The distribution of this vital resource is erratic; 90% of the population receives only $90m^3$ per capita/year. Furthermore, underground water is the main water resource. Nearly 60% of the total renewable water resource (about 1.3 billion m^3) is underground water. The total amount of water used in 2000 was estimated at 3.4 billion m^3, suggesting a country-wide water shortage of 0.9 billion m^3. The arable land under cultivation is estimated to be 1.1 million hectares, representing less than 2% of the total land of the country in 2003. The annual rate of desertification in Yemen is about 3-4% and the population growth rate is 3.3%. After ten years, banana plantings will be unproductive; this will increase costs and exacerbate food poverty in Yemen.

Purpose

Yemen is classified as a low-income / food deficit country (LIFDC) and imports over 75% of its main staple wheat. Some 2.7 million people live below the food poverty line, consuming less than 2,200 calories per capita per day, while 35% of the population (nearly 5 million people) lives below the poverty line. The food security status of households is also threatened by natural resource degradation. Poor people depend on natural resources for their income so environmental problems will negatively affect their income. Banana production means misusing scarce and vital resources in Yemen. This

paper will analyze why small farmers prefer banana production and its effect on macroeconomic stability in Yemen.

Study Methodology

The Agro-Economic Survey of Wadi Surdud provides reliable statistics on agricultural production and utilization and are vitally important for formulation and evaluation of development plans. A lack of basic data is one of the main obstacles against to formulating effective agricultural development programs in Yemen.

To provide necessary data, cost of production for several crops including cereals, fruits, vegetables and chase crops, were collected by a team of three Bjal extension workers, three Al-Kaden research station staff, and a TDA employee. The total area covered by the survey was 1899 ha. Sixteen crops were included in the survey as the main crops of Wadi Surdud. Combining this survey with a survey conducted in 2000 by the agricultural statistics department of the Ministry of Agriculture and Irrigation (MA&I), we estimated the aggregate cropping pattern shown in Table 1. Crops in the Surdud Districts and the area for each crops in year 2003 were taken from the survey.

Table 1. Wadi Surdud Cropping Pattern for 2003.

	Area from Sample Survey - 2003					Survey - 2000			
Crops	**Area(Ha)**	**%**	**Frequency**	**Saif**	**Kharif**	**Area(Ha)**	**%**	**Area(Ha)**	**%**
Grain sorghum	358.25	19.36	27	35.0	65.0	19,366.99	35.05	20,197.82	35.06
Millet	314.53	17	7	0	100	17,003.49	30.78	17,732.93	30.78
Maize	81.74	4.42	2	60	40	4,418.86	8	4,608.43	8
Cowpea	6.29	0.34	4	40	60	1,480.65	2.68	1,544.17	2.68
Cotton	9.15	0.49	5	0	100	694.81	1.26	724.62	1.26
Tobacco	1.31	0.07	1	0	100	99.48	0.18	103.74	0.18
Sesame	34.1	1.84	6	0	100	2,589.41	4.69	2,700.50	4.69
Watermelon	15.68	0.85	8	70	30	562.37	1.02	586.49	1.02
Tomatoes	28.47	1.54	10	0	100	1,021.09	1.85	1,064.89	1.85
Okra	17.74	0.96	4	0	100	636.25	1.15	663.55	1.15
Other vegetables	3.92	0.21	3	50	50	140.59	0.25	146.62	0.25
Mango	310.51	16.78	18	20	80	1,672.44	3.03	1,726.78	3
Banana	138.78	7.5	19	40	60	747.49	1.35	779.55	1.35
Guava	14	0.76	2	60	40	75.41	0.14	78.64	0.14
Date palm	42	2.27	1	40	60	226.22	0.41	235.92	0.41
Other fruit	-	-		50	50	16.07	0.03	17.41	0.03
Fodder	474.18	25.62	12	50	50	4,498.53	8.14	4,691.51	8.14

Total	1,850.65	100		55,250.15	100	57,603.58	100

Source:

Analysis and Results

Costs and Returns

The first step in the analysis is to identify relevant costs and benefits that subsequently could be used to develop cash flow budgets over the life of the projects. These costs and returns are reported in Tables 1 and 2; all components are reported on a per-hectare basis.

Table 2.Mangoes, Per-Hectare Cost and Return Estimate, 2003.

	Unit	Quantity	Price YR	Value YR
Gross Income	Kg	43,861.2	126.25	5,537,476
Inputs				
Plants	Ls			31,300
Urea Fertilizer	Kg	86.4	38.56	3,332
Other Fertilizer	Kg	59.1	83.8	4,953
Manure	Kg	2,258	2	4,516
Chemicals & Pesticides	Kg	3.4	1172	3,985
Others	Kg	3.4	1731	5,885
Labor				
Irrigation	hours	310.8	100	31,080
Fertilization	man-day	3.3	300	990
Chemicals	man-day	4.4	500	2,200
Irrigation	man-day	70.4	300	21,120
Weeding	man-day	22	300	6,600
Harvesting	man-day	104.5	400	41,800
Post-harvesting	man-day	22	400	8,800
Transportation				47,448
Others				27,114
Zakat		5%		276,874
Total Cost				517,996
Net Income				5,019,480

Table 3. Bananas, Per-Hectare Cost and Return Estimate, 2003.

	Unit	Quantity	Price YR	Value YR
Gross Income	Kg	38950.8	35.87	1,397,165
Inputs				
Plants	LS			164,600
Urea Fertilizer	Kg	165	36.67	6,051
Other Fertilizers	Kg		97066	
Manure	Kg	1650	1.85	3,052
Chemicals & Pesticides	Kg	13.5	1000	13,500
Others	Letr	4.4	1400	6,160
Labor				
Irrigation	hours	1320	100	132,000
Sowing and planting labor	man-day	33	250	8,250
Fertilization	man-day	3.5	250	875
Chemicals	man-day	6.6	500	3,300
Irrigation	man-day	165	250	41,250
Weeding	man-day	55	250	13,750
Lightening / patching	man-day	16.5	250	4,125
Harvesting	man-day	60.5	400	24,200
Post-harvesting	man-day	41.2	400	16,480
Transportation				132,000
Others				7,671
Zakat		5%		69,858
Total Cost				647,123
Net Income				750,042

Internal Rate of Return (IRR)

Although financial management theorists argue that it has shortcomings, the most popular economic criterion for choosing among investment projects is the internal rate return (IRR); it is widely used by the World Bank and other international financing institutions in their economic and financial analyses (Brigham and Gapenski, 1997). The internal rate of return is the discount rate that results in a zero net present value for the project. In other words, IRR is the rate that equalizes the net present value of the cost and benefit streams of the project. It is the maximum interest rate that a project could pay for the resources used if the project is to recover its investment and operating costs and still break even. Although there are theoretical difficulties with the IRR, a major advantage of IRR analysis is that estimation of an interest rate to use in discounting costs and benefits to present value is avoided. This measure gives a ranking usually not greatly different from the benefit-cost ratio defined above or a ranking of net present values. Ranking projects according to this criterion will indicate in a very general way that one project is better than another, in the sense that it contributes more to the national income as compared to the resources used. If the choice has to be made from a range of alternative acceptable projects under the limited budget constraint, raise the discount rate an IRR greater than the cut-off rate can be implemented. From tables 3 and 4 we can see that the

IRR in Surdud Wadi for the crops mangoes and bananas are more than satisfactory at 71% IRR for mangoes and 52% for bananas.

Table 4. Analysis of mango crop for 10 hectares.

Years	Capital Cost (000YR)	Operating Costs (000YR)	Land Rent (000YR)	Gross Cost (000YR)	Gross benefits (000YR)	Net Cash Flow (000YR)
1	350.2	1,125.5	573.9	2,049.6	301.5	-1,748.2
2		799.8	573.9	1,373.7	301.5	-1,072.2
3		799.8	573.9	1,373.7	301.5	-1,072.2
4		799.8	573.9	1,373.7	301.5	-1,072.2
5		1315.4	573.9	1,889.3	8,158.7	6,269.4
6		1402.4	573.9	1,976.3	9,428.2	7,451.8
7		1549.6	573.9	2,123.5	11,575.8	9,452.3
8		1824.5	573.9	2,398.4	15,587.1	13,188.7
9		2,143.4	573.9	2,717.3	20,240.0	17,522.7
10		3,918.9	573.9	4,492.8	46,145.6	41,652.8
11		3,918.9	573.9	4,492.8	46,145.6	41,652.8
12		3,918.9	573.9	4,492.8	46,145.6	41,652.8
13		3,918.9	573.9	4,492.8	46,145.6	41,652.8
14		3,918.9	573.9	4,492.8	46,145.6	41,652.8
15		3,918.9	573.9	4,492.8	46,145.6	41,652.8
16		3,918.9	573.9	4,492.8	46,145.6	41,652.8
17		3,918.9	573.9	4,492.8	46,145.6	41,652.8
18		3,918.9	573.9	4,492.8	46,145.6	41,652.8
19		3,918.9	573.9	4,492.8	46,145.6	41,652.8
20		3,918.9	573.9	4,492.8	46,145.6	41,652.8

Sorghum is intercropped in the first four years.

IRR= 71%

Table 4. Analysis of banana crop for 10 hectares.

Year	Capital Cost (000YR)	Operating Costs (000YR)	Land Rent (000YR)	Gross Cost (000YR)	Gross benefits (000YR)	Net Cash Flow (000YR)
1	195.1	4,393.2	573.9	5,162.2	1,646.2	-3,516.0
2		4,984.7	573.9	5,558.6	4,469.0	-1,089.5
3		4,984.7	573.9	5,558.6	6,621.2	1,062.7
4		4,984.7	573.9	5,558.6	8,056.0	2,497.5
5		4,984.7	573.9	5,558.6	11,643.0	6,084.5
6		4,984.7	573.9	5,558.6	11,643.0	6,084.5
7		4,984.7	573.9	5,558.6	11,643.0	6,084.5
8		4,984.7	573.9	5,558.6	11,643.0	6,084.5
9		4,984.7	573.9	5,558.6	11,643.0	6,084.5

10	4,984.7	573.9	5,558.6	11,643.0	6,084.5

Sorghum is intercropped in the first year.

IRR = 52%

Table 5 summarizes the financial and economic analyses presented above and includes the net income per hectare of land and per m^3 of water since it may be that water is most limiting.

Table 5. Financial Analysis

	Bananas	**Mangoes**
B/C	2.159	10.690
Net Income per ha (YR)	750,042	5,019,500
IRR	52%	71%
Water used per ha	34 m^3	24 m^3
Net Income per m^3 (YR)	22,060	209,145

Conclusions

The economic analyses indicated that net income of Mango is grater by about 4.0 million YR. then a Hacter banana but Farmers prefer Banana because it is giving theme income every 45 days to cover their living cost, waiting for only one year income is beyond these farmers payment capacity. Farmers in this area are living under poverty line and there is no policy at micro or macroeconomics' level to settle their problems. Week management and absent of sector police is the mean obstacle of misallocation of natural resources in Yemen. Credit System in Yemen did not recognized these kind of problem. Yemen & most of the developing countries view the problem of poverty from a humanitarian social angle rather than from an economic outlook. From an economic point of view, poverty means the inability to produce because of the absent or weak financial and vocational qualifications, physical unfitness, or because of an unfavorable economic environment that does not allow the poor to be easily integrated into the economic development process.

References

Al-Hebshi Mohamed, Ph. D. Dissertation on "An Analytical Study of The Agricultural Credit System in Yemen", CAIRO University, 1990.

Al-Hebshi Mohamed, M. Sc. Thesis On "An Analytical Economic Study of the Role of Finance in Agricultural Development in Yemen", Al-Azhar University, Egypt 1982.

Associated Consulting Engineers- ACE (PVT) LTD, Karachi, 75350 Pakistan in association with Ghayth Aquatech, Sana'a ROY, UPDATING THE FESIBILTY STUDY AND DETALID DESING FOR SORUDUD DAM PROJECT, VOLUME- 1-2-3, Sana'a, January 2004

Brigham, Eugene F., and Louis C. Gapenski, Financial Management: Theory and Practice. New York: The Dryden Press. 1997.

Sir William Halcrow & Partners, WADI SURDUD BEVELPMENT ON THE TIHAMA, Sana'a Yemen Arab Republic, 31st August 1978.

The World Bank, "Republic of Yemen Comprehensive Development Review for Financial Sector Building Block" Sana'a 2002 (www.worldbank. org/yemen)