

Supplementary Material

Returns to Food and Agricultural R&D Investments in Sub-Saharan Africa, 1975-2014

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Table S-1: African Related Research Evaluation Evidence

Authors	Year	Number of		Internal Rate of Return			Benefit-Cost Ratio		
		Evaluations ^a	Estimates ^a	Average	Minimum	Maximum	Average	Minimum	Maximum
Evenson, R., and Kislev, Y.	1975	2	2	34.5	29.0	40.0			
Abidogun, A.	1978	2	2	35.5	34.0	37.0			
Evenson, R., and Flores-Moya, P.	1978	11	22	79.7	32.0	102.0	58.0	8.0	146.0
Evenson, R.	1987	1	1	35.0	35.0	35.0			
Norgaard, R.	1988	1	1				149.0	149.0	149.0
Schwartz, L., Sterns, J., and Oehmke, J.	1989	1	1	63.0	63.0	63.0			
Karanja, D.	1990	2	2	54.5	40.9	68.1			
Mazzucato, V.	1991	2	2	59.0	58.0	60.0			
MacMillan, J., Mudimu, G., MacRobert, J., Rugube, L., Guveya, E., and Mutemeri, I.	1992	1	2	22.0	22.0	22.0	1.4	1.4	1.4
Thirtle, C., Atkins, J., Bottomley, P., Gonese, N., and Goverch, J.	1992	1	1	54.0	54.0	54.0			
Bindlish, V., and Evenson, R.	1993	2	2	201.0	52.0	350.0			
Bindlish, V., Evenson, R., and Gbetibouo, M.	1993	4	4	101.0	86.0	136.0			
Howard, J., Chitalu, G., and Kalonge, S.	1993	12	12	57.3	-100.0	110.3			
Mazzucato, V., and Ly, S.	1993	1	1	10.0	10.0	10.0			
Schwartz, L., Sterns, J., and Oehmke, J.	1993	3	3	63.0	31.0	92.0			
Thirtle, C., Atkins, J., Bottomley, P., Gonese, N., Goverch, J., and Khatri, Y.	1993	1	1	43.0	43.0	43.0			
Thirtle, C., Von Bach, H., and Van Zyl, J.	1993	3	3	136.0	128.0	145.0			
Boughton, D., and De Frahan, B.	1994	10	10	81.8	38.0	135.0			
Byerlee, D., and Traxler, G.	1994	4	4	45.5	25.0	54.0			
Howard, J.	1994	6	6	88.3	42.1	116.6			
Kupfuma, B.	1994	4	4	44.4	43.5	46.5			
Laker-Ojok, R.	1994	19	19	25.8	-12.3	49.0			
Laker-Ojok, R.	1994	20	20	10.0	-56.6	35.8			

Table S-1 – Continued

Authors	Year	Number of		Internal Rate of Return			Benefit-Cost Ratio		
		Evaluations ^a	Estimates ^a	Average	Minimum	Maximum	Average	Minimum	Maximum
Sanders, J.	1994	1	1	74.0	74.0	74.0			
Smale, M., and Heisey, P.	1994	4	4	34.8	4.0	63.0			
Sterns, J., and Bernsten, R.	1994	5	5	6.6	-2.3	15.5			
Anandajayaskeram, P., Martella, D., Sanders, J., and Kuffuma, B.	1995	12	12	20.8	4.3	27.6			
Byerlee, D., and Traxler, G.	1995	4	4	40.0	23.0	52.0			
Lubulwa, G.	1995	1	1	12.8	12.8	12.8			
Lubulwa, G., Gwaze, D., Clarke, J., Milimo, P., and Mulatya, J.	1995	3	3	12.9	0.0	26.8			
Lubulwa, G., Wafula, B., Craswell, E., Willet, I., and Davis, J.	1995	1	1	20.4	20.4	20.4			
Mudhara, M., Anandajayasekeram, P., Kupfuma, B., and Mazhangara, E.	1995	4	4	44.8	42.0	47.2			
Ouedraogo, S., Illy, L., and Lompo, F.	1995	1	1	78.1	78.1	78.1			
Seck, P., Sidibe, M., and Beye, A.	1995	3	3	34.5	32.9	37.0			
Tre, J.-P.	1995	4	4	19.5	17.9	21.4			
Aghib, A.	1996	6	6	55.9	45.0	66.4			
Akgundor, S., Makanda, D., and Oehmke, J.	1996	1	1	14.0	14.0	14.0			
Arnade, C., Khatri, Y., Schimmelpfennig, D., Thirtle, C., and Van Zyl, J.	1996	3	3	90.7	44.0	170.0			
Chisi, M., Anandajayaskeram, P., Martella, D., Ahmed, M., and Mwape, M.	1996	17	17	18.5	10.2	25.2			
Howard, J., and Mungoma, C.	1996	7	7	73.9	42.1	96.0			
Karanja, D.	1996	4	4	49.8	39.0	60.8			
Khatri, Y., and Thirtle, C.	1996	1	1	44.3	44.3	44.3			
Makanda, D., and Oehmke, J.	1996	2	2	7.5	3.0	12.0			
Njomaha, C., Adamou, A., and Yapi, A.	1996	9	9	56.2	10.9	122.5			
Oudraogo, S., and Illy, L.	1996	1	1	7.0	7.0	7.0			
Rueda, J., Elwell, P., Walker, T., Soto, M., Bicomumpaka, M., and Berrios, D.	1996	1	1	84.0	84.0	84.0			

Table S-1 – Continued

Authors	Year	Number of		Internal Rate of Return			Benefit-Cost Ratio		
		Evaluations ^a	Estimates ^a	Average	Minimum	Maximum	Average	Minimum	Maximum
Yallah, N.	1996	1	1	188.0	188.0	188.0			
Yapi, A., Kergna, A., Debrah, S., Sidibe, A., and Sanogo, O.	1996	2	2	60.0	50.0	70.0			
Anandajayasekeram, D., Martella, D., Sanders, J., and Kupfuma, B.	1997	2	2	9.5	5.0	14.0			
Berlin, R.	1997	2	2	34.1	30.6	37.6			
Bindlish, V., and Evenson, R.	1997	1	1	28.0	28.0	28.0			
Edwin, J., and Masters, W.	1997	1	1	34.1	34.1	34.1			
Isinika, A.	1997	1	1	33.2	33.2	33.2			
Mazhangara, E., Anandajayasekeram, P., Mudhara, M., Martella, D., and Murata, M.	1997	1	1	59.0	59.0	59.0			
Moshi, A., Anandajayasekeram, P., Kaliba, A., Martella, D., Mwangi, W., and Shao, F.	1997	2	2	21.0	19.0	23.0			
Murata, M., Anandajayasekeram, P., Mudhara, M., Martella, D., and Mazhangara, E.	1997	2	2	9.0	6.0	12.0			
Niederwieser, J.	1997	2	2	3.0	2.0	4.0			
Oudraogo, S., and Bertelsen, M.	1997	1	1	52.7	52.7	52.7			
Seidi, S.	1997	1	1	26.0	26.0	26.0			
Townsend, R., Van Zyl, J., and Thirtle, C.	1997	1	1	28.8	28.8	28.8			
Bua, A., Acola, G., Adupa, R., Otim-Nape, G., Baguma, Y., and Sserunkuma, D.	1998	1	2	167.0	167.0	167.0	18.2	18.2	18.2
Mokoena, M.	1998	8	8	33.3	-2.0	54.0			
Townsend, R., and Van Zyl, J.	1998	1	1	40.0	40.0	40.0			
Wessels, J., Anandajayasekeram, P., Van Rooyen, C., Marasas, C., Littlejohn, G., and Coetzee, C.	1998	1	1	7.7	7.7	7.7			
Byerlee, D., and Traxler, G.	1999	2	2	37.5	23.0	52.0			
Elbasha, E., Thornton, P., and Tarawali, G.	1999	1	2	38.0	38.0	38.0	3.3	3.3	3.3

Table S-1 – Continued

Authors	Year	Number of		Internal Rate of Return			Benefit-Cost Ratio		
		Evaluations ^a	Estimates ^a	Average	Minimum	Maximum	Average	Minimum	Maximum
Kristjanson, P., Rowlands, J., Swallow, B., Kruska, R., and De Leeuw, P.	1999	1	2	33.0	33.0	33.0	34.0	34.0	34.0
Kristjanson, P., Zerbini, E., Rao, K., Kiresua, V., and Hofs, P.	1999	1	2	28.0	28.0	28.0	15.0	15.0	15.0
Marasas, C.	1999	2	2	24.2	21.6	26.8			
Maredia, M., and Byerlee, D.	1999	14	14	24.9	7.0	43.0			
Mokoena, M., Townsend, R., and Kirsten, J.	1999	2	2	47.5	44.0	51.0			
Mukhebi, A., Chamboko, T., O'Callaghan, C., Peter, T., Kruska, R., and Medley, G.	1999	2	2				5.0	2.4	7.6
Rohrbach, D., Lechner, W., Ipinge, S., and Monyo, E.	1999	1	1	50.0	50.0	50.0			
Yapi, A., Debrah, S., Dehala, G., and Njomaha, C.	1999	2	2	85.0	75.0	95.0			
Yapi, A., Dehala, G., Ngawara, K., and Issaka, A.	1999	1	1	95.0	95.0	95.0			
Esterhuizen, J.	2000	4	4	89.5	64.0	119.0			
Randela, R.	2000	1	1				0.8	0.8	0.8
Schimmelpfennig, D., Thirtle, C., Van Zyl, J., Arnade, C., and Khatri, Y.	2000	2	2	51.0	44.0	58.0			
Falconi, C., Omamo, S., D'leteren, G., and Iraqi, F.	2001	1	2	32.0	32.0	32.0	5.1	5.1	5.1
Kaliba, A., Fox, S., and Norman, D.	2001	3	3				362.6	268.7	456.8
Rutherford, A., Odero, A., and Kruska, R.	2001	1	1				0.0	0.0	0.0
Townsend, R., and Thirtle, C.	2001	1	1	35.0	35.0	35.0			
Zeddies, J., Schaab, R., Neuenschwander, P., and Herren, H.	2001	1	1				199.0	199.0	199.0
Zegeye, T., Tesfahun, G., and Anandajayasekeram, P.	2001	1	1	29.0	29.0	29.0			
Bokonon-Ganta, A., De Groote, H., and Neuenschwander, P.	2002	1	1				145.0	145.0	145.0
Diaz-Hermelo, F., Langyintuo, A., and Lowenberg-DeBoer, J.	2002	1	1	4.7	4.7	4.7			

Table S-1 – Continued

Authors	Year	Number of		Internal Rate of Return			Benefit-Cost Ratio		
		Evaluations ^a	Estimates ^a	Average	Minimum	Maximum	Average	Minimum	Maximum
Kristjanson, P., Tarawali, S., Okike, I., Singh, B., Thornton, P., and Manyong, V.	2002	1	2	71.0	71.0	71.0	63.2	63.2	63.2
Mather, D., Bernsten, R., and Maredia, M.	2002	1	1	46.5	46.5	46.5			
Aw-Hassan, A., Shideed, K., Ceccarelli, S., Erskine, W., Grando, S., and Tutwiler, R.	2003	9	9	32.2	22.0	51.0			
De Groote, H., Ajuonu, O., Attignon, S., Djessou, R., and Neuenschwander, P.	2003	1	1				124.0	124.0	124.0
Johnson, N., Manyong, V., Dixon, A., and Pachico, D.	2003	2	2	15.5	9.0	22.0			
Johnson, N., Pachico, D., and Wortmann, C.	2003	1	1	18.0	18.0	18.0			
Thirtle, C., Lin, L., and Piesse, J.	2003	14	14	15.1	-12.0	58.0			
Nieuwoudt, W., and Nieuwoudt, T.	2004	1	2	17.0	17.0	17.0	1.6	1.6	1.6
Briones, R., Dey, M., Stobutzki, I., and Prein, M.	2005	24	24				29.0	1.3	100.0
Macharia, I., Lohr, B., and De Groote, H.	2005	1	2	86.0	86.0	86.0	24.0	24.0	24.0
Ajayi, O., Place, F., Kwesiga, F., and Mafongoya, P.	2007	3	3	13.1	3.2	20.8			
Boys, K., Faye, M., Fulton, J., and Lowenberg-DeBoer, J.	2007	1	1	13.3	13.3	13.3			
Dey, M., Kambewa, P., Prein, M., Jamu, D., Paraguas, F., and Pemsl, D.	2007	1	2	12.2	12.2	12.2	1.4	1.4	1.4
Laxmi, V., Erenstein, O., and Gupta, R.	2007	1	2	57.0	57.0	57.0	39.0	39.0	39.0
Briones, R., Dey, M., Ahmed, A., Prein, M., and Stobutzki, I.	2008	40	40				2.2	0.0	7.4
Fan, S., and Zhang, X.	2008	5	5				12.4	10.8	14.7
Akinola, A., Alene, A., Adeyemo, R., Sanogo, D., and Olanrewaju, A.	2009	8	16	31.1	17.0	43.0	11.0	3.0	24.0
Alene, A., and Coulibaly, O.	2009	27	27	45.9	5.0	82.0			
Alene, A., Menkir, A., Ajala, S., Olanrewaju, A., Manyong, V., and Ndiaye, A.	2009	10	20	48.8	28.0	74.0	23.0	10.0	84.0

Table S-1 – Continued

Authors	Year	Number of		Internal Rate of Return			Benefit-Cost Ratio		
		Evaluations ^a	Estimates ^a	Average	Minimum	Maximum	Average	Minimum	Maximum
Kaitibie, S., Omore, A., Rich, K., Salasya, B., Hooton, N., and Mwero, D.	2010	1	1	55.0	55.0	55.0			
Maredia, M., and Raitzer, D.	2010	1	2	4.0	4.0	4.0	1.0	1.0	1.0
Moussa, B., Lowenberg-DeBoer, J., Fulton, J., and Boys, K.	2011	8	8	59.7	8.3	132.3			
Macharia, I., Orr, A., Simtowe, F., and Asfaw, S.	2012	1	2	55.0	55.0	55.0	5.0	5.0	5.0
Magen, B.	2012	1	1	17.9	17.9	17.9			
Ayanwele, A., Adekunle, A., Akinola, A., and Adeyemo, V.	2013	6	12	30.5	22.0	38.0	24.2	9.2	44.0
Oleke, J., Manyong, V., Mignouna, D., Isinika, A., Mutabazi, K., and Hanna, R.	2013	1	2	13.2	13.2	13.2	1.0	1.0	1.0
Nedumaran, S., Bantilan, C., Mason-D'Croz, D., and Singh, P.	2014	1	1	50.0	50.0	50.0			

Source: Compiled by authors. See reference list below for further details.

^a A single evaluation (of a particular technology, project, or program) within a given study may report multiple IRR or BCR estimates, or both

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