Documented Outcomes and Impacts of Bean/Cowpea and Dry Grain Pulses CRSP Activities (in alphabetical order of country)

Country / Region	Crop	Technology	Indicators of Outcome and Economic Impact	Documentation (source study)
Cameroon (northern)	Cowpea	Improved varieties introduced and distributed by SAFGRAD/CRSP program	Adoption rate – 25% of farmers Estimated IRR – 15%	Sterns and Bernsten.1994. MSU International Development Working Papers. No. 43. http://purl.umn.edu/54727
Central America (4 countries) and Ecuador	Bean	Improved varieties	Adoption rate – 46-82% (across countries) Yield gain – 10-21 kg/ha/year Estimated IRR – 22% (C. America); 35% (Ecuador) NPV -- $177 million	Reyes 2012. PhD Dissertation (forthcoming)
Dominican Republic (San Juan Valley)	Bean	Improved variety (PC-50)	Adoption rate – 46-51% farmers	Mather 2001. MS Thesis. http://www.aec.msu.edu/theses/abstract.cfm?RecordID=1215
Ecuador (Northern)	Bean	Disease resistant improved variety (red mottled)	Adoption rate – 45% Economic gain – 18% lower unit cost Estimated IRR – 29% NPV -- $1.29 million	Mooney 2007. MS. Thesis. http://www.aec.msu.edu/theses/abstract.cfm?RecordID=1359
Honduras	Bean	Disease resistance trait in improved varieties	Adoption rate – 41-46% (two principal bean growing areas) Income gain – 7-16% Estimated IRR – 41% NPV -- $50 million	Mather et al. 2003. *Agricultural Economics* 29 (December 2003) 343-352. Mather 2003. PhD Dissertation. http://www.aec.msu.edu/theses/abstract.cfm?RecordID=1288
Honduras (Yoro, Comayagua, Santa Barbara)	Bean	Improved varieties developed through Participatory Plant Breeding	Adoption rate – 32% of bean area Effect size – 135-203 kg/ha more than traditional varieties Estimated IRR – 10-12%	Reyes 2011. MS Thesis. http://www.aec.msu.edu/theses/fulltext/reyes_ms.pdf
Mexico (Durango, Zacatecas and Chihuaha)	Bean	Improved varieties	Adoption of IV averaged 71% in Chihuahua, 42% in Durango and 8% in Zacatecas Yields of IV-- 20.6% higher than traditional varieties Estimated IRR – 18-21%	Gonzalez-Ramirez et al. 2003. PhD Dissertation. <http://www.aec.msu.edu/theses/abstract.cfm?RecordID=1246> Gonzalez-Ramirez et al., 2005. *Agricultura Technica Mexico* 31(1) (May-June), pp. 73-88. <http://redalyc.uaemex.mx/redalyc/src/inicio/ArtPdfRed.jsp?iCve=60831108>

Country / Region	Crop	Technology	Indicators of Outcome and Economic Impact	Documentation (source study)
Senegal	Cowpea	Improved varieties (CB-5 promoted through "Operation Cowpea")	Estimated IRR – 31-92%	Schwartz et al. 1993. *Agricultural Economics*, v.8, no.2, February (1993), pp. 161-171. http://www.sciencedirect.com/science/article/B6T3V-45BC5C4-5/2/c47bf3d06eb31718bd382a3cbc427e59
Senegal	Cowpea	Improved varieties	Estimated adoption rate – ~30-40%	Megan 2012. MS Thesis (forthcoming)
Senegal (north central)	Cowpea	Nonchemical cowpea storage method (metal drums) and two short-season cowpea varieties (Mouride and Melakh)	Adoption of storage technology - 69% of farmers surveyed in north central peanut basin Adoption of two improved varieties – 3.6% of surveyed area Estimated IRR – 13% NPV - $4.31 million Annualized benefits - $246,000	Boys et al. 2007. *Agricultural Economics*, 36 (Jan): 363-375 <http://www.blackwell-synergy.com/doi/abs/10.1111/j.1574-0862.2007.00213.x>
USA (Michigan)	Bean	Improved varieties	Adoption of MSU varieties – 27% Estimated NPV -- $30 million Average annual benefits - $1.9 million	Maredia et al. 2010. *Agricultural Economics*, 41: 425-442
West and Central Africa (7 countries)	Cowpea	Grain Storage (hermetic storage in airtight containers, improved ash storage, and the solar heater)	Adoption rate – 13-64% across 7 countries Estimated IRR – 29% NPV -- $295 million Annualized benefits -- $17 million	Moussa et al. 2011. *Journal of Stored Products Research* 47 (2011), p. 147-156. http://www.sciencedirect.com/science/article/pii/S0022474X11000233

Source: Compiled by Maredia, M. (2012)