

Demand-Led Plant Breeding

Chapter 7

The Business Case for Investment in New Variety Development

Rowland Chirwa



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Objectives

- To strengthen plant breeders' ability to create compelling business cases for investments in demand-led plant breeding

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2. Investment Decisions
3. Cost Estimation and Management
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1. Introduction

- Changing perception of breeding as a cost to breeding as an investment that gives a return
- Plant breeding bring benefits to many people - farmers, consumers and others in value chain
- Successful plant breeding brings economic, social and environmental benefits

Group Discussion

- List all potential benefits from a breeding program?
- List types of costs for creating a new variety?
- What provides a convincing investment case to R&D managers, public and/or private sector investors?

Benefits and Investment Case Study

- Analysis of Australian chickpea case study
 - Example for review on how to create a compelling benefits and investments case
- GRDC Investments in Australian national chickpea breeding program. Available at:
<http://www.grdc.com.au/Research-and-Development/Impact-Assessment>.

2. Investment Decisions

Investment Decisions

- Breeders need to justify a plant breeding program for specific market demanded varieties - as an investment rather than an expenditure on the institute's budget.
- Making the case for a new demand-led breeding project requires understanding the benefits and costs and balancing them to justify investment in new variety development versus alternative options.

Benefits and Beneficiaries

- Examples of benefits and beneficiaries in Table 7.1 below

Beneficiary	Specific benefit	Benefit consequence	Benefit type	Quantification units
Farmers	Greater yield	Farmer income, Shift from subsistence farming to entering markets, Business growth, Can afford education for child	Economic	USD
	Earlier or later cropping (than vs. main season)	Higher prices (as less supply)	Economic	USD
	Improved crop quality	Higher price, more customers	Economic	USD
	Improved plant architecture	Easier harvesting Time saving	Economic	USD
Seed producers	Greater seed yield, Higher productivity per area grown	Farmer income, Unit costs are less. More competitive price to distributors	Economic	USD/person hours
Transporters	Less damage in transit	Cost saving	Economic	USD
Wholesalers	Improved shelf-life	Cost saving	Economic	USD
Food processing companies	Source from local farmers rather than imports	Cost saving Reliable supply	Economic, Logistics	USD
Food retailers/ Supermarkets	Good varieties and sourcing from local smallholders	Freshness and higher prices Differentiation and fair trade brands		
	Improved shelf-life	Loss of wastage and costs		
Consumers	Easier preparation	Time saving	Economic, Social	USD
	Shorter cooking time	Energy saving	Economic Social	USD
Public investors Governments , International dev. agencies)	Deliver their mandate, Support balance of payments, Economic development, Farmer livelihoods	Economic development, Continued funding for plant breeding projects and support for innovation and science	Economic, Social	USD

3. Cost Estimation and Management

Examples of likely costs in breeding program in Table 7.2 (as cash or personnel (FTE) costs)

Discipline or item	Manpower (FTE)	Cash
Farmer and value chain market research		
Meetings and consultations with farmers and the value chain to define needs and priorities to create variety designs and set breeding targets and goals, Specific market research studies	YES	YES
Project governance and decision-making		
Management meetings – to review project progress and make stage plan advancement decisions and including clients/stakeholders	YES	YES
Project management – to create the demand-led development plan, monitor and evaluate progress	YES	YES
Investment case creation - discussions with economists, social scientists, management and budget holders to create case comprised of project benefits and costs. Project proposal and plan creation (and liaison with donors if required)	YES	YES
Plant breeding		
Plant breeders	YES	YES
Laboratory or greenhouse technicians	YES	NO
Molecular biology: sequencing, genotyping and other data analysis	YES	YES
Experimental design and Data management		
Bioinformatics advice and statistics packages	YES	YES
Computer access and power	YES	YES
Germplasm evaluation		
Farm trial operations - labour (on-site, off-site)	YES	NO
Farmer participatory breeding trials	YES	YES
Agronomists	YES	NO
Plant protection	YES	NO
Soil scientists	YES	NO
Processing performance tests	YES	YES
Food company or other value chain stakeholders performance tests	YES	YES
Consumer based assays (including out-sourcing) e.g. cooking and taste trials	YES	YES

4. Investment Decision Making

Key Messages

- Understanding the value and costs of investing in plant breeding is critical to success for a breeder
- Detailed analysis is required on the merits of each case and the strength and degree of certainty of each assumption
- When the benefits are higher than the costs, it may be worth making the investment in developing a new variety
- Opportunity cost: Also consider alternative variety design, activity option or other breeding program that could be a better investment choice for using the resources available

Investment Analysis Tool

- Project rationale
- Financial metrics as inputs for analysis
 - E.g. seed market size, projected growth, market share of new variety, gross profit on seed; total breeding costs .
- Outputs: Investment analysis – Performance and investment metrics .
- Demonstration on how to use Investment Tool (Appendix 7.1

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