The viability of innovation

Economic support to Project Catalyst

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Project Catalyst aims to reduce the environmental footprint that sugarcane production has on freshwater quality and the Great Barrier Reef. To do this, Project Catalyst focuses on the adoption of cutting edge practices in the sugar industry. To achieve water quality improvements, these cutting edge practices focus on soil health, farm production efficiency and precision planning.

What is economics?
Economics is pivotal to understanding sustainability, business viability and explores the trade-offs between making different decisions, using a dollar value. Growers in Project Catalyst are making decisions that alter their management practices, farm equipment, business performance, and ultimately their viability. Economic analysis develops their understanding of how much their innovation or technology may affect their business performance and long term sustainability.

Why is economics important?
Economics is an important aspect for growers, natural resource management bodies, industry organisations and government organisations as it allows an understanding of the relevant costs and benefits of an action at a farm level, industry level, and policy level.

To ensure the long term sustainability of the individual farmers and the sugar industry long term profitability and economic viability is critical. Completing an economic analysis with growers allows them to understand if their Project Catalyst innovation or technology improves their profitability, business resilience and subsequent management implications. It is this information that often results in growers further innovating, adjusting practices, and strategically thinking about the long-term direction of the farm.

Economically viable innovations and technologies increase the rate of adoption by growers and often have spill over effects to an industry level, when large shifts occur. Particularly, where there are large capital investments, and major production system adjustments, the impact on farmers, contractors, mill operators and processing must be considered. For example the shift to GPS and wider row spacing has required an adjustment by contract harvesters, planters, and fertiliser applicators.

> "It's always been hard to innovate in such a low profit industry it has been hard spending the capital... innovation has made us stay on the farm if we had not adopted any innovations then we wouldn't be farming anymore"
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> - Gerry Deguara, Project Catalyst grower

The profitability and economic implications of the technologies and innovations at a farm level provides insights for NRM groups into potential adoption by growers outside the group, efficient allocation of future funds, targeting of further extension, targeting of incentives, incentive mechanisms, future monitoring and evaluation. The economic viability of an innovation is a key factor in adoption as growers are only able to adopt technologies/innovations that improve water quality if they also increase profits and/or reduce exposure to either/both weather risk and price risk. The identification of innovations or technologies that are not economically viable for the farmer, but have significant water quality improvements allows the NRM groups to identify why the innovation is not being widely adopted and improve policy mechanisms to increase adoption. If the innovation is economically viable this presents an opportunity to provide extension and education to increase adoption of growers outside Project Catalyst.

What are we looking for?
Economic analysis looks in detail at the innovation or technology to determine the viability of the investment, or in other words, to determine if the small on-going benefits are sufficient to cover the cost of the initial capital investment. The productivity (subsequent increase in yields) or the efficiency (subsequent reductions in inputs) is also explored to understand how the innovation affects the whole production system.

The economic analysis results in a number of key indicators for the grower to understand the change in profitability: the interest rate required to break-even if loans are required; the time until break-even will be achieved; and the benefit to cost ratio.

Often as a grower's understanding of the innovation/ technology increases, further components of the production system will be adjusted/modified to improve sustainability further. This potentially creates a flow on effect and allows the increased profits to be available for further on-farm innovations and technologies to be trialled.

Risk is a key aspect in adoption of a new innovation or technology. There are two main types of risk, weather risk and price risk, which the grower has little control over yet impact significantly on the viability of the any new innovation or technology. To understand the robustness of the innovation/ technology an analysis is completed with numerous scenarios of price and yield to account for the possibilities a grower may face in any given year. This provides the grower with a deeper understanding of the innovation/technology with less appealing prices and/or cane yield.

Over time the support that growers seek varies, with different economic analyses completed and built on to achieve a new level of economic understanding, in a similar fashion to the changes in agronomic support a grower requires over time. Initially many growers seek information about their technology or innovation and its impact on the production system, which usually contributes to a great level of understanding of the business indicators and how their farm business is performing overall. Further to this they may seek a greater understanding of the level of economic change that is required to achieve business goals.

Catalyst grower Tony Bugeja and Brooke Edwards (formerly DAFF) at the annual Project Catalyst Forum.

Rob Sluggett, Project Catalyst Farmer and Agronomist (Farmacist).

> "We have no desire to push practices that send people broke, the trick is how do we do it in a way that is economic? sustainable? and good for everyone?
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> - Rob Cairns, WWF