Workshop on Measuring the Impact of Integrated Systems Research

27-30 Sept 2021

Independent Science for Development Council

Why does OneCGIAR need Integrated Systems Research?

Holger Meinke, Chair of ISDC

Photo Credit: C. De Bode

A short story:
Using science to facilitate a policy/industry dialogue

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- In the late 1980s **peanut growers** in Northern Australia wanted scientific backing to gain Govt support, claiming exceptional climate conditions.
- **Government** wanted to know if such support was justified.
- Our analysis of climate data that coincided with the industries establishment and expansion confirmed industry's claim for exceptional circumstances.
- However…

- … using 100 years of climate data, a different picture emerged.
- The period of the industry's establishment and expansion coincided with more reliable summer rains and drier conditions during harvest.
- Based on this insight, peanut growers did not get the Government support they were seeking.
- Instead, we started working with government and industry and devised climate-aware management strategies.
- This included better adapted planting dates, changes in harvesting techniques and on-farm drying facilities.

Australian Journal of Experimental Agriculture, 1995, **35**, 777–80

Climatic risk to peanut production: a simulation study for Northern Australia

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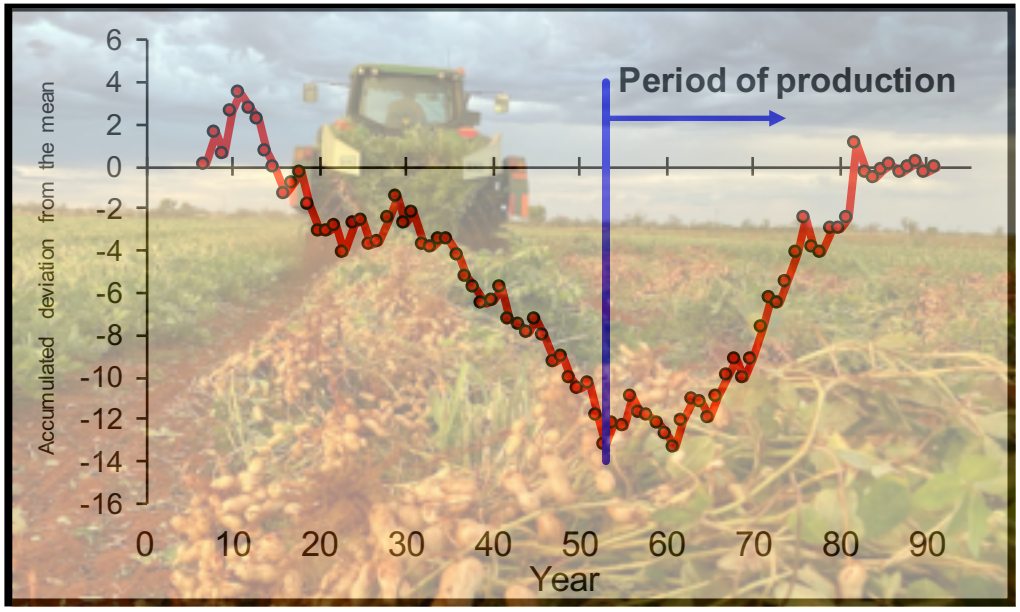
Queensland Department of Primary Industries/CSIRO Agricultural Production Systems Research Unit, PO Box 102, Toowoomba, Qld 4350, Australia.

Summary. A dynamic peanut simulation model was used to quantify climatic risk to peanut production in Northern Australia. We demonstrate how district yield information can be usefully combined with simulation results to assess objectively impact and causes of climatic variability on production. Our analysis shows that the rapid expansion of the peanut industry in the region corresponded with relatively stable, above-average yields caused by that period in the historical record having above-average and less variable summer rainfall. During this period the timing and amount of rainfall was such that yields higher than average could often be achieved, and harvests were only rarely interrupted by prolonged wet periods. These conditions created unrealistically high expectations of yields by producers, and when the climate was more variable during the 1980s, it was perceived as a greater deviation from the norm than justified by the long-term record.



https://doi.org/10.1071/EA9950777


Question
What do you think was the single, most-important factor leading to management and policy changes?

Levels of technologies and their key characteristics
for Matching Scientific Knowledge with Nature of the Problem

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Level	Examples	Characteristics	Foreseeability	Scale
Level I	Vaccine to prevent COVID Smart irrigation technologies to save water ***Disciplinary*** ***Control***			
Level II	COVID vaccine distribution and roll-out within countries Water saved used for private rather than public good (e.g. Murray Darling Basin, Australia) ***Interdisciplinary*** ***Adaptive***			
Level III	A fair & effective global health system, i.e. global sharing of vaccines Global water governance that fosters collaboration and preserves resources ***Transdisciplinary*** ***Consensus seeking***			

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ISR can win you the Noble Prize

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https://www.nobelprize.org/prizes/peace/1970/borlaug/lecture/

… The quality of scientific leadership is certainly a vital factor in the success of any production campaign …

… institutions have the moral obligation to serve agriculture and society also; and to discharge that obligation honorably, they must try to help educate scientists and scientific leaders whose primary motivation is to serve humanity …

… Where are the leaders who have the necessary scientific competence, the vision, the common sense, the social consciousness, the qualities of leadership, and the persistent determination to convert the potential benefactions into real benefactions for mankind in general and for the hungry in particular? There are not enough of them now …

Photo credit: worldfoodprize.org

1944: Norman Borlaug with Vice President Henry Wallace and Mexican Minister of Agriculture Marte R. Gómez. https://achievement.org/achiever/norman-e-borlaug/

Donors and investors ask different questions
(modified from Ralser, 2013)

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CGIAR

Issue	Donor	Investor
Need for funding	*Have you demonstrated the need for your services?*	*How will funding your research improve the situation?*
Approach to the Problem	*Does your approach to addressing the problem fit within our giving guidelines? Is the problem you are trying to solve familiar to us?*	*Does your approach to addressing the problem make sense (i.e. ToC)? Is it logically cohesive?*
Funding Level	*Have we sufficiently spread our available funding across issues and organizations addressing the problem?*	*Is this the right amount of money for your research to bring about real change?*
Delivering Results	*What activities did you undertake to address the need?*	*What outcomes did you deliver, and how do they improve the lives (alleviate the problems) of your primary customers?*
Measuring Success	*Have you completed your report according to our guidelines?*	*How will you measure and communicate impact to me?*

Some key characteristics of effective ISR

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- Answer precise questions quantitatively and vague questions with a convincing narrative and then bridge the gap between them.
- Systems serve multiple purposes and involve natural, social and technological components.
- In the absence of a control group, use a model for scenario analysis and hypothesis testing.
- Stop analysing the problem (it paralyses policy) and start articulating the solutions (make the work policy-relevant).
- The more intractable the system, the more likely that solutions need to be found in the policy arena rather than on-farm or in the business.
- For impact to occur, innovations must be scalable and scaled.
- Proposed systems changes ('innovations') must consider trade-offs.
- ISR is the catalyst for innovations and can help bridging the different levels of technologies.

The ultimate answer to life, the universe and everything is … 42!

Douglas Adams

Question

What do you think was the single, most-important factor leading to management and policy changes?

Answer

The objective provision of a model-based situation analysis that was credible and accepted as legitimate by industry and Government.

This enabled farmers, policy makers and scientists working together to implement transformational changes.