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## The Role of Economics in Policy Advice: An Agriculture Perspective<sup>1</sup>

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### Abstract

It is widely understood within the policy literature that economic advice is critical in policy development. Ken Henry argued that economic policy advice should be analytically sound, strategically focused and compelling. But where do these skills come from in the policy advisor, and what role do they have going forward? This paper will explore this idea in the agricultural context, using the legacy of John L. Dillon, Foundation Professor of Farm Management at the University of New England, case studies from the Department of Agriculture and Fisheries Queensland and the authors' own experiences. Moving from the hey-day of agricultural economics to the present and future, the contemporary role of economics in agricultural policy advice will be explored through practical examples of biosecurity and investment prioritisation.

**Key words:** John Dillon, policy advice, agricultural economics, biosecurity.

### Introduction

To effectively influence the policy discourse, economic policy advisers, and more broadly policy advisors, must provide ministers with advice which is analytically sound, strategically focussed and most importantly compelling (Henry, 2007). This holds true whether they are independent advisers, in the minister's office or government officers. Whilst these ideas are not new in themselves, the key role of the economics profession in providing these foundational skills is often overlooked.

This paper will examine the impact of John Dillion's work, and demonstrate how the discipline of agricultural economics has been instrumental in developing the skills and practice of numerous policy advisors, senior public servants, consultants, and company senior executives. The agricultural economics discipline continues to provide an understanding of how the economy and the world

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works in a practical way – not just as a theoretical construct. It is this practical understanding that enables one to develop and communicate convincing policy arguments to non-economists and economists alike.

Moving forward, as the operating environment becomes more volatile, uncertain, complex and ambiguous, the question is - how can these skills (agricultural economic foundational skills) assist new and emerging professionals to shape the policy discourse? To examine this question we will use the example of biosecurity policy.

### **John Louis Dillon (1931-2001) – his background**

John embodied the mix of science, economics and practical knowledge that can be argued to be intrinsic to the makeup of successful agricultural economists, and more broadly agricultural policy advisors, today. He had a background in agriculture (dairy sharefarmer), undertook foundational studies in science (Bachelor of Science in agriculture 1952 University of Sydney) and later studies in economics (PhD in game theory in risky farm decisions, Iowa State University) (Anderson, 2002). He was appointed the Foundation Professor of Farm Management at the University of New England (UNE) at age 33, and oversaw the development of a focus on teaching Farm Management Economics. This reached to the experience of a generation of agricultural economists with the *Farm Management Game* as undergraduates.

John was influential at state, national and international level, the latter through the Food and Agriculture Organization of the United Nations (FAO) and international research centres. Colleagues report his unflinchingly critical mind and derision for received wisdom.

### **John's Work**

John's early work within the Heady school at Iowa State University was on how production biology interfaced with economics: econometric approaches to establish production functions and understanding the dynamics of the bio-economic relationships within these production functions (see for example Heady and Dillon, 1961; Dillon, 1968). Linear programming led to the ability to provide well-founded production recommendations to individuals and to policy makers. Working back from farmers' observed behaviour led to an improved understanding of why farmers make certain decisions, by modelling their choices and constraints.

A logical progression from this thinking was to analyse risk and investigate preferences, offering corresponding/compatible solutions, through:

- Identification and quantification of objective risk,
- Assessment of decision-makers' attitude to risk,
- Derivation of subjective risk as seen by decision-makers and its Bayesian revisions,
- Incorporation of risk attitude in a decision-making framework (expected utility theory), and
- Generation of decision options that correspond with the above (Anderson et al., 1977).

This study of risk analysis from the perspective of the agricultural firm was one of the reasons why the UNE Department of Agricultural Economics was among the top dozen in the world during John's leadership.

John followed Earl O. Heady's path in turning attention onto agricultural research, becoming a widely recognised expert assisting and influencing the work of the international research centres of the CGIAR on how to deliver the next gains in the volume and quality of food given recognition of

increasing competition for finite resources and the environmental consequences of the rapid economic development of the post-war decades (see Langley et. al., 1994; Dillon and Hardaker, 1993; McConnell and Dillon, 1997).

In the early 1990's John was the Chair of the Australian Centre for International Agricultural Research, then a statutory organisation within the portfolio of Foreign Affairs and Trade and part of Australia's international aid effort. John would chair discussion on the approval and funding of each proposed project and would lead the Board's discussion of the progress reports on existing projects. It was a prolonged process, because he would be at pains to seek out from the Research Directors where each piece of research could contribute to reducing hunger and poverty, and how the process of delivering impact could be facilitated or accelerated. His breadth of understanding of the agricultural activities in each partner country and their dynamics meant he had built a mental model of the likely impact very quickly, and he was impatient if the answers to his questions did not demonstrate equivalent familiarity with the context for delivery of outcomes.

### **Agricultural Economists – what have they done, where are they now?**

But the argument we want to put to you is broader than John Dillon's work – we want to argue that the agricultural economics profession has provided us with an enduring legacy – within and outside of agriculture. Agricultural economics didn't just give you a good grounding in agriculture and economics, it gave you a good understanding of how businesses, markets, the economy and the world worked, in a very practical way. Agricultural economics was a perfect launching pad for engaging in policy development - weighing up the pros and cons, considering the potential unintended or perverse outcomes, working through the political implications etc.

Graduates from agricultural economics have gone on to find jobs in many sectors of the economy: senior public servants, political advisors, Ministers of state including Australian Treasurers and state Premiers, consultants, company senior executives - both linked to agriculture and outside of agriculture.

Some examples include:

**Michael John Taylor** – completed a degree in agricultural science before studying agricultural economics at the University of New England. Mike was the former Director General of the Victorian Department of Agriculture and Secretary of Commonwealth departments addressing agriculture and regional development. In 2007 he was made an Officer of the Order of Australia for “service to the management of natural resources and industry policy development at the Federal level and also in Victoria, particularly in the area of agriculture, and through contributions to transport, water, food and safety standards” (PMC, 2018).

**Jock R. Anderson** – background in beef, pig, wheat, and sorghum farm, called "Clifton Hills," in the Upper Burnett, agricultural science degrees, then went on to specialize in agricultural development economics, risk and decision theory, and international rural development policy. Chief Research Economist at the Australian Bureau of Agricultural Economics, and later agricultural economist and rural development policy advisor at the World Bank.

**Dr. Derek R. Byerlee** – originally from a South Australian sheep/wheat farm, completed his Masters in agricultural economics at the University of New England in 1968. He has worked internationally on agricultural development issues, including at the World Bank where he was the lead author of the 2008 *World Development Report*, at the time of the last food crisis (Byerlee et al., 2008).

**Dr. Beth Woods** – family background in farming, worked her way up through the ranks in the then Queensland DPI, starting as an agricultural extension officer on the Atherton Tablelands, then a D Phil in Agricultural Economics supported by a Rhodes Scholarship (first women cohort), Professor at UQ, Deputy Director General then Director General of the Department of Agriculture and Fisheries and part of the Queensland government’s leadership board.

In the political sphere several prominent figures have brought agricultural economics perspectives to their respective roles. Some examples include:

- John Kerin, with a background in economics and poultry farming, served as a Commonwealth Minister addressing agriculture and resource industries before serving as Australia’s Treasurer in 1991.
- Mike Ahern, with a degree in agricultural science majoring in agricultural economics, was the Queensland Minister for Primary Industries before serving as Premier from 1987-1989.
- John McVeigh, with a degree in business (marketing and economics) and a PhD in Agribusiness Management (University of Queensland), served as Queensland Minister for Agriculture, Fisheries and Forestry prior to being appointed Commonwealth Minister for Regional Development, Territories and Local Government.

### **The Challenge Facing Economics Today**

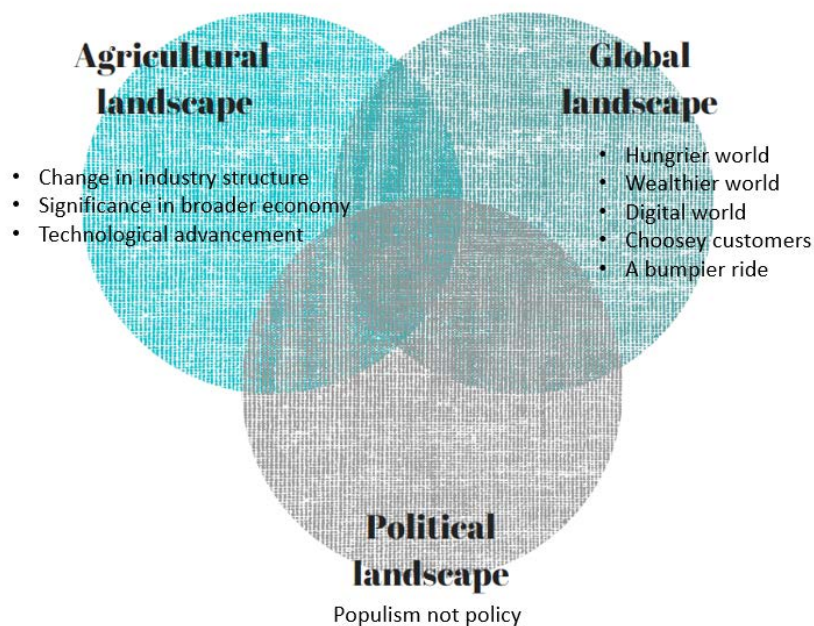
Due to a significant extent to John’s efforts and those of his contemporaries and successors, we are doing reasonably well on the identification and quantification of objective risks, decision makers’ attitude to risk, and a suite of similar tools to characterise decision makers and their preferences, which allow us to offer decision options that correspond with the above. Furthermore, thanks to John and his fellow agricultural economists, significant progress has been made in agricultural research allocation. However, decision-makers often appear to ignore these options. Examining why is important for identifying the role of economics going forward.

In a new era of increasingly partisan “post-normal” science, observing the Popperian norms of hypothesis testing is indispensable for retaining broad credibility. We need to demonstrate that economics is a crucial component in reading the social mood - the major policy constraint - and put priority on behavioural approaches from the individual to the social levels as a very important if not the most important current economics research area. Evermore complex modelling of the world is our basic tool for planning the future, but unless our presentation retains a sense of perspective in terms of its limitations and extent of applicability, we risk Malthusian comparisons and dismissal out of hand.

### **The Future for Economics in Agriculture**

Examining John’s work and his legacy has given us a basis for our narrative around the role of economics in policy. We are going to explore this narrative further taking the present example of biosecurity policy and looking forward.

Before that however, we are going to start by recognising that the economics profession – just like the agricultural industry - has come a long way and delivered positive benefits, but going forward, especially in the current environment, the challenge is bigger. The current environment has shifted significantly from the heyday of agricultural economics (Figure 1).

**Figure 1. Shifts in the operating environment since the heyday of agricultural economics**

There has been significant change in:

**The agricultural landscape** – the structure of the industry has changed dramatically, it’s significance in broader economy has shifted, and there have been technological advancements.

**The broader global landscape** – the landscape has changed with the overarching long term trends of:

- A hungrier world – increasing population growth is driving demand for food and fibre,
- A wealthier world – the emergence of a growing middle class is resulting in changing food preferences,
- A digital world – advanced technology and genetics are changing the way we grow, make and transport food,
- A choosy world – customers are information rich and increasingly demanding food that is produced in line with their morals and ethics, and
- A bumpier world – the effects of urbanisation, climate change and the intensification of agriculture are impacting on production systems (Colbeck, 2015).

**The political landscape** – Australia has seen five Prime Ministers in five years. It can be argued that the current environment is one of populism politics not policy. As Ian Chubb, former Chief Scientist of Australia, observed in his recent Press Club address, “the noise seems to be winning over facts and evidence”. Look at climate change and energy policy for examples – the polls continue to show that the majority of Australians want change but we go around in circles with the policy (Ridout et al., 2018).

Moving forward we can expect the operating environment to continue on this path, becoming more volatile, uncertain, complex and ambiguous. As Ken Smith, Chief Executive Officer and Dean of the Australian and New Zealand School of Government stated, “things are not going to settle down, and the public service must respond by becoming more comfortable creating complex responses for complex problems” (Smith, 2018).

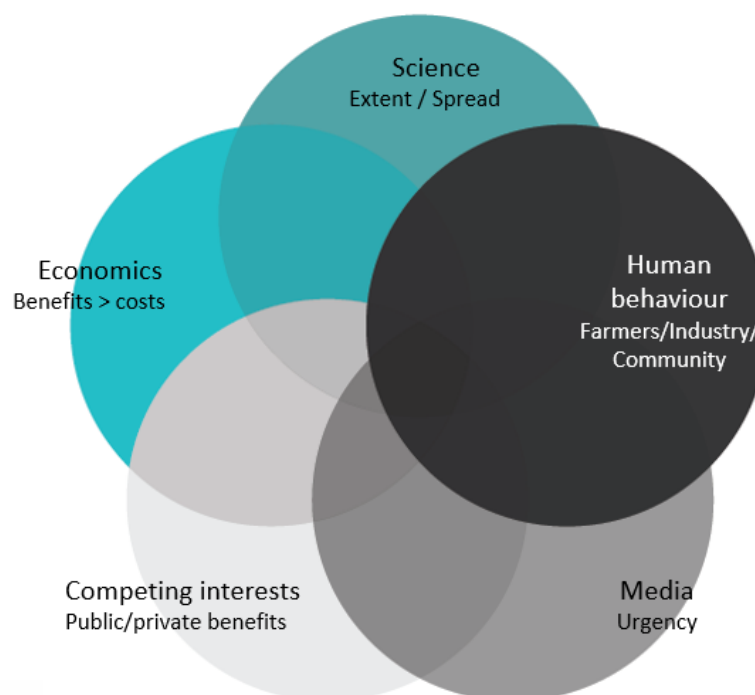


Within biosecurity, we see that this holds true – we need to think of different ways to tackle the problems as current methods just won't work in this environment.

Let's examine the current role of economics in the system. Within biosecurity, early work focused on quantifying the impacts of pests and diseases, and the identification of optimal management decisions. There are numerous examples – in recent history, fire ants, panama, white spot disease in prawns, Asian honey bees, varroa mite, the list goes on (see for example Hafi et al., 2012; Hafi et al., 2014). But the key feature in all of them is the role of economic advice in the policy narrative, and also the contribution of agricultural economics in understanding farm level impacts and changes in farmer behaviour.

At the species/disease level the work on determination of optimal management options from an economic viewpoint is a seemingly straight forward decision, costs versus benefits - eradicate if the benefits of doing so are greater than the cost (and it is technically feasible), if not try to minimise impact through containment or do nothing. However, in practice, decisions about how to respond often take a surprisingly long time to make (Hulme, 2006). Why? The intersection and competing priorities between science, economics and human behaviour (Figure 3).

**Figure 3. Factors in biosecurity decision making**



Risk and uncertainty are major challenges to rapid response. For example, in the early stages of an invasion, the full extent of abundance and its potential spread (in our climate) is almost never known, let alone its long term impacts on the affected industries, ecosystems and community. Fire ants is a perfect example of this – on best available information at the time of initial discovery, the area of extent was defined, but now outliers are being found. Are they outliers or just a function of a lack of understanding of the true extent?

In addition, managing biosecurity risk depends on what people do as much as on the science of how an invasive species spread. Again, in the case of fire ants, people are carriers for spread (e.g. giving a pot plant to grandma, moving house). Communities are needed to help report and target effort.

Further complicating this is the public-private benefits conundrum, who benefits and who should pay for the service. Biosecurity services often have a mix of private and public good characteristics. As such, decision makers need to balance the different needs of diverse stakeholders and to evaluate the complex trade-offs associated with different options.

Political debate and media pressure have a significant capacity to ignite policy changes sometimes greater than economic or scientific evidence alone. Therefore, to fully support successful management of biosecurity incidents, economic advice needs to be cognisant of this decision making environment and as Henry argued, provide analytically sound, strategically focused and compelling advice if they are to influence policy debate.

Taking this up to the system level thinking posed earlier as key to addressing future challenges, the same argument for rigorous, compelling economics holds.

At the broader biosecurity system level, economics has more recently focused attention to the question of system-wide investment decision-making to maximise net benefit using a risk return approach. This has evolved as resource challenges continue and risks increase. To address this we turn to 'big models'. At the national level a risk return resource allocation model has been developed to provide advice to the Australian Government on the return, in terms of reduced risk, for its investment in biosecurity activities (Mascaro, 2014). The model applies to over 60 organisms that could enter Australia via over 50 different pathways. Each of these pathways are represented by a Bayesian network entry model (which handles all the organisms that can enter via that pathway). In determining each of these models, uncertainty and risk are major variables, with the models only being as good as the available information.

The model as it stands currently focuses on pre-border – so how does this help inform decision making at the local level once the challenge is post-border? States are now considering this problem and trying to develop similar models. Victoria has focused their model around the generalised invasion curve – shifting resources from low to high return on investment, or mounting arguments for where government should invest (Craik et al., 2017).

All this sounds very promising but in practice we run into the problem of a lack of understanding and application of economic principles and the lack of compelling advice that can be understood by decision makers. Let's reflect on our experience in Queensland.

Whilst there is a directive for government agencies to demonstrate value for money, it has been difficult to embed long term. In November 2016 the Queensland Audit Office stated "there are still service areas that do not report how well departments use public resources to deliver outcomes" (QAO, 2016). Government in general is brilliant at measuring "busyness" – the number of reports produced, people engaged with, responses conducted etc. But as a whole there is a lack of understanding and expertise in measuring and quantifying outcomes for the public.

At a professional and policy level we have responded by calling on our economists to lead and inspire capability development across all the professional groups in our department to better define the impacts we are seeking to deliver and to test how we might best allocate resources to achieve the desired outcomes (Goswami and Lane, 2017). Throughout this process cultural change has been key. Considerable effort was placed on de-mystifying economics and evaluation, and working to re-



write the legacy of past approaches where economic evaluation led to rationalisation of programs of work – even though they were necessary, well informed and provided benefits. Much of the recent work is focused on demonstrating the benefits of economics to individuals, in assisting them to improve their programs and demonstrating their benefit.

Given that the most recent directions in biosecurity policy are built around the recognition that biosecurity depends on the decisions of individuals across all aspects of their life and work, we will need to also work on the interface with all Queenslanders. At this level the message must be focused on the important issues (identified through our modelled analysis) but pitched strategically to engage community members on the outcomes that are important to them.

Our New Zealand colleagues have recently released their effort to begin engaging citizens in this narrative in a campaign titled '*Ko Tātou This Is Us – It takes all of us to protect Aotearoa*' (Biosecurity New Zealand, 2018). In its essence this is their rational argument of an economist based on analytically sound and compelling evidence wrapped up into strategically focused compelling narrative that we referred to earlier.

## Conclusion

Our call to action for economists going forward is to 'shape the future' on biosecurity. We need to build policy advocacy for decision makers that are founded on the economic skill set that goes with rational thought, rigorous analysis and relevant advice. Furthermore, it is the role of economics to ensure the advice is packaged into a compelling narrative that can be understood and used by all to not only shape future policy, but to guide individual behaviour and deliver future benefits.

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