

**INQUIRY INTO LONG-TERM SUSTAINABILITY OF THE
DAIRY INDUSTRY IN NEW SOUTH WALES**

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Hon Mark Banasiak MLC
Committee Chair
Portfolio Committee no. 4 - Industry NSW Legislative Council
6 Macquarie Street
Sydney NSW 2000

Inquiry into the long-term sustainability of the dairy industry in New South Wales

Dear Mr Banasiak,

I am a Senior Researcher at the Institute for Governance and Policy Studies at Victoria University of Wellington, New Zealand. I research freshwater ecology, ecological modelling bio-assessment, freshwater policy, energy, economics and environmental science. In light of your inquiry into the long-term sustainability of the dairy industry in New South Wales, I would like to take this opportunity to share some of the information from my years of research to provide some insight into the devastating toll the industry has already taken on the environment in the last few decades alone, both in New Zealand and around the world.

The catastrophic cost of a failed global agriculture system

New Zealand is a microcosm of a failed global agriculture system that is driving [biodiversity loss](#), [nitrogen pollution](#) and [climate change](#). Rather than taking advantage of its natural attributes like nutrient-rich soils, abundant rainfall, low human population and a global perception of clean and healthy ecosystems, New Zealand instead intensified and industrialised agriculture. It went from a low-input sustainable food production system to one based on fossil-fuel-derived, synthetic nitrogen fertiliser and energy. Ecologists have described the ecological consequences of this land-use intensification as a “[riches to rags](#)” transformation.

In the last three decades, the number of dairy cattle has more than doubled and [milk production trebled](#). But this production growth was achieved through massive [increases in irrigation](#), [fertiliser use](#), [imported animal feed](#) and [energy use](#). The negative impacts on the environment, freshwater ecosystem and human health have been extreme, as the following information demonstrates:

Increase in greenhouse gas emissions

Agriculture is responsible for [half of New Zealand's greenhouse gas emissions](#). Since 1990, emissions have increased by 13.5%, predominantly from [growth in dairy farming](#). Earlier this year, the Interim Climate Change Committee (ICCC) [recommended](#) that agricultural emissions should be brought under the [New Zealand Emissions Trading Scheme](#) as soon as possible. It is now [widely recognised](#) that land-use intensification in high-input agriculture sectors globally has negative environmental impacts.

Wildlife on the verge of extinction

The most comprehensive indicator of the freshwater ecosystem deterioration is the decline in aquatic [biodiversity](#). In the conservation estate and undeveloped mostly mountainous areas, waterways are pristine, but the lowland reaches are degraded and rapidly declining.

The evidence is clear that the primary driver of declines in freshwaters in New Zealand by volume and river length in the last few decades is [agricultural intensification](#). Unsurprisingly, given the increased external inputs, the amount of nitrogen leaching from livestock each year has [more than doubled](#) during this time. These leached nutrients, as well as pathogens resulting from intensification have had significant negative impacts on [rivers](#), [groundwater](#), [lakes](#) and [oceans](#). As a result, a world-record three-quarters of native New Zealand fish are now listed as threatened with extinction, ranking among the worst in the world.

Higher incidence of cancer from drinking water in farmed areas

Excess nitrogen is not just an issue for ecosystem health. [Evidence](#) linking exposure to nitrate in drinking water to negative health outcomes is growing. Nitrate is formed when nitrogen combines with oxygen and has been [linked to colon cancer](#) as well as increased risk of developing thyroid disease and neural tube defects. A stark New Zealand example is the contamination of [drinking water](#) in the Canterbury region from agricultural nitrate and the associated increase in the risk of [cancers](#).

Risk to human health from swimming in rivers and waterways

In the last three decades since national water quality monitoring of rivers began, [water quality has declined](#), especially at pasture and urban catchment sites. [Eighty-five percent of waterways in pasture catchments](#) (which make up almost half of the country's waterways by length) now exceed [nitrate limit guidelines](#). Swimming in most rivers in farmed areas in New Zealand now poses a risk to human health from the ingestion of [pathogens](#). Apart from nutrients and pathogens, other [emerging contaminants](#) are now showing up in waterways and [aquifers](#), their impacts yet to be quantified.

Decline in drinking water quality and safety

Groundwater quality is also on the [decline](#), 62 percent of monitored bores showed significant increases in nitrate, 59 percent had faecal bacterial indicator (E. coli) concentrations that did not meet drinking water standards and 64 percent had increasing trends in E. coli. Urban waterways are even [worse](#) than waterways in farming catchments but these urban waterways make up less than one percent of the national waterway length. Urban declines are mainly due to wastewater discharges to freshwaters and the degradation of [waste and stormwater infrastructure](#).

Research has shown that [specific nitrogen and phosphorus limits](#) are necessary to protect the quality of people's drinking water and the ecological health of waterways. For example, in China, the limit for nitrogen in rivers is [1 milligram per litre](#). In New Zealand, [85% of waterways in pasture catchments](#) (which make up half of the country's waterways, if measured by length) now exceed [nitrate limit guidelines](#).

How not to address the problem

In May 2020, the New Zealand government released a long-awaited [NZ\\$700 million package](#) to address freshwater pollution. The new rules include higher standards around cleanliness of swimming spots, set controls for some farming practices and how much synthetic fertiliser is used, and require mandatory and enforceable farm environment plans.

But the package is flawed. It does not include any measurable limits on key nutrients (such as nitrogen and phosphorus) and the rules' implementation is left to regional authorities. Over the 30 years they have been managing the environment, the health of lakes and rivers has [continued to decline](#). For full disclosure, I was part of the 18-person [science technical advisory group](#) that made the recommendations. Despite more than a year of consultation and evidence-based science, the government deferred or ignored our advice on introducing measurable limits on nitrogen and phosphorus.

The other main policy the expert panels pushed for was a cap on the use of nitrogen fertiliser. The New Zealand College of Public Health Medicine and the [Hawkes Bay district health board](#) both made [submissions](#) calling for a nitrate limit in rivers and aquifers to protect people's health – at the same level recommended by the technical advisory group in order to also protect ecosystems. While the government did indeed introduce a cap as part of their announcement, this cap is set at 190kg per hectare per year, which is too high. This is like telling someone they should reduce smoking from three to two and a half packets a day to be healthier.

Exaggerated claims and a disregard for the future

I believe [claims from the dairy industry](#) that the tightening of environmental standards for freshwater would threaten New Zealand's economic recovery are exaggerated. They also ignore the fact clean water and a healthy environment provide the foundation for our current and future economic well-being. And they fly in the face of modelling by the Ministry for the Environment, which shows implementation of freshwater reforms would [save NZ\\$3.8 billion](#).

Inescapable limits of current farming methods

It is obvious that the high-input agriculture sectors [globally and in New Zealand](#) are in a negative spiral of land use intensification and environmental degradation dependant on a [model](#) of privatisation of profits and socialisation of costs. One reason for failure stems from political exigencies at all levels of government. The problem is that Government at any level operates in an [economic growth](#) paradigm and this inevitably clashes with the uncompromising and [non-linear](#) reality of [biophysical limits to growth](#). These are real inescapable [limits](#), they cannot be fiscally [ameliorated](#) over the long term and claims that environmental harm can be decoupled from economic growth have been [debunked](#).

Water is a finite resource

By 2050, [nearly half the world's population](#) will be living in areas where water is scarce. Every Australian already experiences life with water restrictions and knows conserving water is essential. Yet the dairy industry continues to put a huge strain on this precious resource, using massive quantities every day. Studies carried out to assess the [water footprint of dairy farms](#) in New Zealand concluded it takes at least 1000 litres of water to make one litre of milk. This is also a conservative figure, as the grey water component (approximately one-third) is based on 11.3 mg/l WHO drinking water limit. The average dairy cow drinks around [70 litres of water per day](#), and uses a further 70 litres per day in the milking shed. If humankind has a hope of being able to continue, we have to stop putting impossible demands on our water.

Ensuring a future for humankind

Clearly **change** is needed in the way land is used to grow food globally. Urgently needed is a move away from intensive agricultural systems to innovative regenerative systems that protect and enhance natural resources. A transformation towards 'holistic' farming approaches, such as **regenerative agriculture**, **agroecology**, **agro-forestry**, **climate-smart agriculture**, **conservation agriculture** and building all these on indigenous and traditional knowledge is imperative.

There is **growing evidence** farmers can make more profit by reducing their use of artificial fertilisers. For a century, New Zealand produced milk without synthetic nitrogen fertiliser. Instead, farmers grew clover, which converts nitrogen from the air. If we want to strive for better water quality for future generations, we need to front up to the unsustainable use of artificial fertiliser and seek more **regenerative farming practices**.

For humankind to have a future, we must ensure that our environment is regulated, putting life supporting capacity above all other considerations and furthermore the regulations must be enforced. The clear lesson from the way different countries handled the Covid-19 pandemic is that strong government regulation based on independent non politicised science is crucial for a successful outcome. Thus, I suggest the solution is truly independent monitoring and enforcement of environmental regulation so that agencies undertaking this work are no longer captured by vested interests financial or political.

Additional resources

I also include some additional resources below, in the form of interviews I have given further discussing these issues, my concern and the urgent need for change:

Video -

<https://waterqualitynz.info/2020/08/03/talking-about-a-forum-for-better-future-bff-at-the-alternative-aotearoa-conference/>

<https://waterqualitynz.info/2020/07/14/another-breakfast-tv-interview-on-nitrate-in-drinking-water/>

<https://waterqualitynz.info/2020/07/09/the-biophysical-limits-of-extractivism-my-presentation-at-the-the-extraction-conference-2020/>

Audio -

<https://waterqualitynz.info/2020/07/01/the-lentil-intervention-podcast/>

<https://waterqualitynz.info/2020/05/29/interview-about-water-quality-with-jesse-mulligan-on-radio-nz/>

Thank you for the opportunity to make this submission. I trust the information I have given here has provided some insight as to why the dairy industry is simply not sustainable in New South Wales or indeed anywhere else in the world. Should you require any further details or clarification on any of the above, please feel free to contact me.

Yours sincerely,

Dr Mike Joy
(BSc, MSc 1st class honours, PhD in Ecology)