



UNIVERSITÄT  
BAYREUTH



# Reference to the methods and data used for the Institutional Landscapes project

Date: 30/08/2022

By Sebastian De La Serna,  
Prof. Dr. Stefan Ouma,  
Mirjam Körner,  
Tobias Klinge (University Leuven)

Department of Geography,  
Chair of Economic Geography,  
University of Bayreuth,  
Germany

# Table of Contents

1) Original research objective and its further development	4
2) About the derived data and its sources	4
-Main transfer information	6
- Technical aspects of the geolocation process	6
3) Background information on georeferencing strategies, weighting mechanism and data validation	6
- Georeferencing strategies	6
-Weighting method	9
4) Gross and net values of hectare size and purchase price, the problem of double counting and the aggregation of production and processing	10
-Gross and net values of hectare size and purchase amounts	10
- The problem of double counting	12
-Aggregation of production and processing	14
5) Data validation	16
6) A guide to each variable	16
◆ Registration number on OIO	16
◆ Temporal aspects	16
◆ Buyer and seller	16
◆ Ownership shares according to regions	16
◆ Leasehold and freehold	17
◆ Gross and net values of hectare size and purchase amounts	17
◆ Hectare size order	17
◆ Investor classification	18
◆ Correspondence to Agr. p&p and For. & wp. and, if applicable, Agr. p&p sub-sector	19
◆ Location of investments	20

# List of Figures

Figure 1: Sample size variation across the different themes of the ShinyApp	4
Figure 2: Monthly report containing advertisements	7
Figure 3: A single published asset transaction has two locations.URL disguised	8
Table 1: Weighting scheme	9
Figure 4: Gross and net investments in <i>Agr. p&amp;p</i> or <i>For. &amp; wp</i> (own elaboration)	11
Figure 5: Gross and net land acquisitions in <i>Agr. p&amp;p</i> or <i>For. &amp; wp</i> (own elaboration)	11
Figure 6: Gross related to <i>Agr. p&amp;p</i> or <i>For. &amp; wp</i> (own elaboration)	13
Figure 7: Gross related in <i>Agr. p&amp;p</i> or <i>For. &amp; wp</i> (own elaboration)	13
Figure 8: Counts of investment cases related to <i>Agr. p&amp;p</i> (own elaboration)	15
Figure 9: Counts of investment cases related to <i>For. &amp; wp</i> (own elaboration)	15
Table 2: Gross and net land acquisitions in <i>Agr. p&amp;p</i> or <i>For. &amp; wp</i> own elaboration	17
Table 3: Investor classification in <i>Agr. p&amp;p</i> or <i>For. &amp; wp</i> own elaboration	18
Table 4: <i>Agr. p&amp;p</i> subsectors (own elaboration)	19
Table 5: <i>Agr. p&amp;p</i> division in production and processing (own elaboration)	20
Table 6: <i>For. &amp; Wp</i> division in production and processing (own elaboration)	20

## 1) Original research objective and its further development

The data used to create this ShinyApp was initially collected by Tobias Klinge (now University of Leuven) as part of his master's thesis, which was later published as an article in the Journal Globalizations. The original data covered the years from 2001 to 2017. Sebastian de la Serna (University of Bayreuth) revised and updated this data up to the year 2021.

It gives a detailed account of the methodological steps through which we seek to document the extent to which Aotearoa NZ's land and forestry resources have been appropriated by foreign investors, using a range of indicators.

We take a broader view on the finance-driven appropriation of land- and land-based ventures, accounting for both investments in agricultural production and processing, as well as in forestry and timber processing. We do this because in the global land grab/rush literature, the focus is almost exclusively on land-based agricultural production, which obscures the true nature of how financial interests have reshaped resource geographies.

## 2) About the derived data and its sources

Each observation from the collected dataset contains information on property transfers and property location. Our new sample covers publically available investment data up to 22/12/2021, consisting of 2273 observations. Tobias Klinge's original sample covered investment data up to 14/12/2017, consisting of 1204 observations. Sample sizes vary for different parameters displayed in ShinyApp.

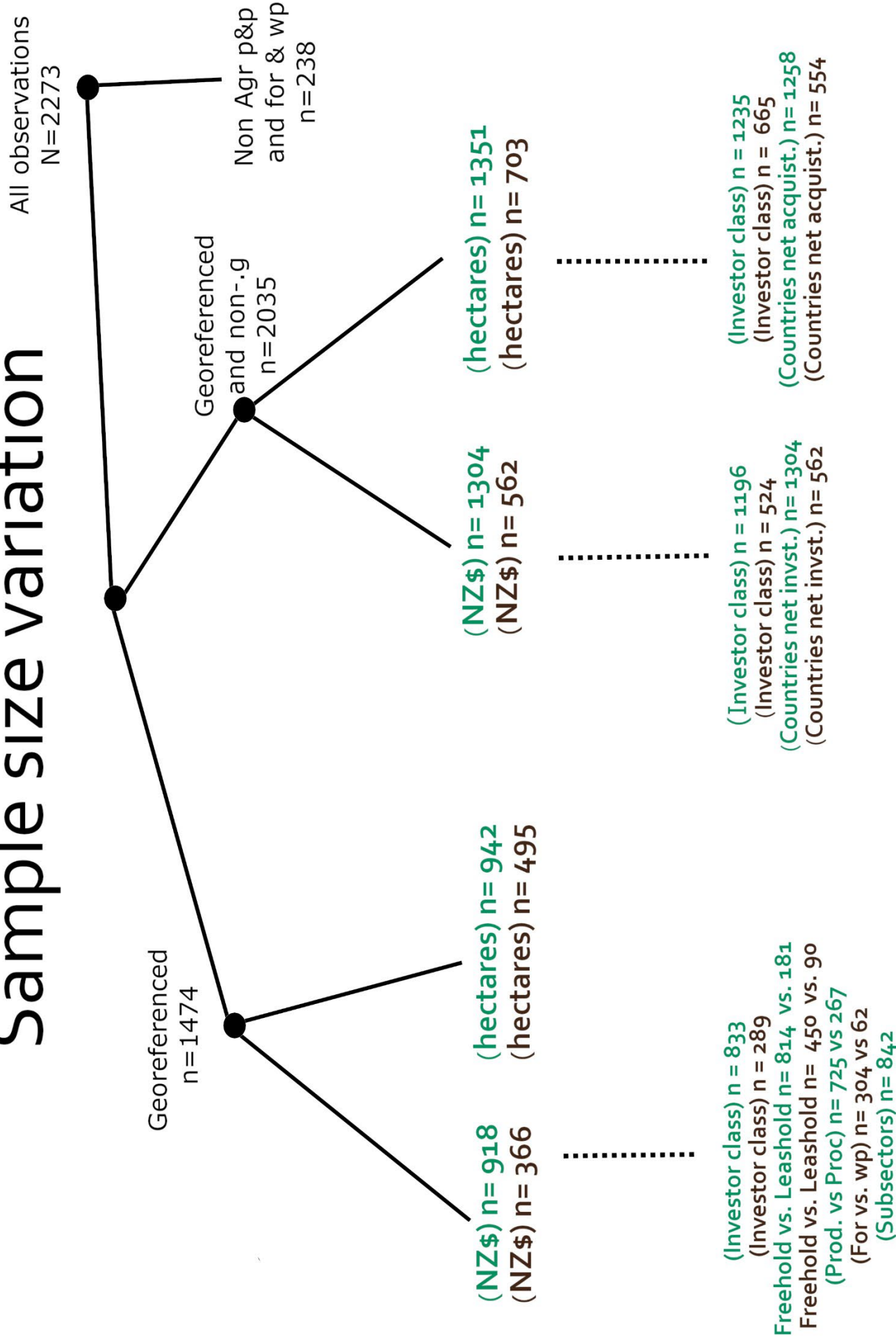
From the total sample size, about 2035 observations are related to "Agricultural production & processing" and "Forestry & wood processing" (*Agr. p&p* and/or *For. & wp*). Consequently, within these 2035 observations a share contains full information in terms of the size of land transacted and the price paid for it. In short, depending on the subtheme of the ShinyApp and the availability of information on the specific asset transacted, the sample size varies. For example, only 1970 and 1788 observations contain full information on land acquisition and investments related to the sectors of *Agr. p&p* and/or *For. & wp*. respectively.

Moreover, as was the case when Tobias Klinge collected the data in 2017/18, in many cases the data was obscure and only published after several years. Thus, some transfers that had not been shared with the public at the time of the original research became available in 2022. Nevertheless, some data gaps remain, but thanks to extensive research such as the one that will be detailed below, this project provides insights into the extent to which foreign investors have been taking over Aotearoa New Zealand's land-based resources and agricultural ventures.

Figure 1 outlines the variation in sample size depending on the specific theme of the ShinyApp. The sample is divided according to its relation to the two main sectors and consequently whether the observations contain location information. Overall, NZ\$ currency is used as the main indicator instead of hectares. Finally, the green and brown coloring stay for *Agr. p&p* and *For. & wp* respectively.

Figure 1: Sample size variation across the different themes of the ShinyApp

# Sample size variation



## -Main transfer information

Building on the previous work of Tobias Klinge, all data is taken from *Toitū Te Whenua Land Information New Zealand* ([OIO](#)), which publishes the decisions of the *Overseas Investment Office* (OIO). This public entity is responsible for tracing and regulating overseas investments into New Zealand and its website lists summaries of applications to purchase or lease rural land from 2005 onwards. In addition, we use data obtained by Tobias Klinge from obtained data summaries going back to 2001 from the civil society organization *Campaign Against Foreign Control of Aotearoa* ([CAFCA](#)). No continuous information for earlier years was available due to gaps in publicized data.

The OIO does not need to agree to every purchase; an overseas investment is deemed to be made if at **least 25 per cent of the company** is owned by a foreigner or if the company is based abroad. Furthermore, only investments in so-called "sensitive land" require the approval of the OIO and are therefore published. More about the OIO and its legal basis can be found [here](#).

In addition to these two main information sources, we used several press articles, among them from [The Otago Daily Times](#), [Stuff](#) and [Scoop](#) to solidify and fact-check the data gathering.

The latter sources allowed us to arrive at additional insights concerning background information on applicants and vendors, the prize and size of the transaction (NZ\$ and hectares), the geolocation, investor type as well as potential linkages to a pension fund.

However, we do withhold decision numbers in cases where we provide geolocation.

## - Technical aspects of the geolocation process

In most cases, an address can be found in every OIO or CAFCA transfer report or in related press articles. Once the address is clarified, the georeference, basically the coordinates of such transfer, is obtained by Rstudio through its `geocode_OSM` function from `tmaptools` package. This way Rstudio connects to the Nominatim Openstreet Map (OSM) platform and queries for each address its coordinates. It is important to point out that the query syntax, the way the address is written to search it on OSM, is adapted as otherwise the query will not retrieve the right information.

Once georeferencing was completed, we validated the addresses with Google Maps to consolidate the location under observation. In case the stated address could not be traced, we used the platform [NZ Topo Map](#) to shed light on the transfer's locational details and the coordinates were filled in manually.

## 3) Background information on georeferencing strategies, weighting mechanism and data validation

### - Georeferencing strategies

While Tobias Klinge's approach was based on aggregate observations of foreign investments into farmland and forestry, we were able to georeference each investment in the ShinyApp. We registered the farming/forestry asset location that the OIO provides. For entries located in multiple locations, the purchase amount was divided among these locations weighted by land area. We are aware that this is an idealized number that may not be completely true in empirical terms, but at the same time this allows us to visualize money flows into the countryside at least to some extent. If, on the other hand, an investor acquires an entire company that operates in several locations and no specific locations are stated, then the georeferenced of the transfer is the main location of the newly acquired asset.

The aim of this step was to identify large-scale trends and visualize transfers of asset ownership. For now, only the observations from 2006 to 2022 contain geographic geometrical information. It is still possible to georeferenced observations prior to 2006, but for economic reasons we did not make the extra effort to mine the CAFCA website for this information. Additionally, due to the already huge size of the dataset, we have focused more on developing the ShinyApp than on expanding the dataset.

Decision Summaries - September 2019	
The Overseas Investment Office has released the following decisions for this month.	
Case number	Applicant
201720131	<a href="#">Zhang Zhou Trustees Limited as Trustee for the Zhang Zhou Family Trust</a>
201810134	<a href="#">EnviroWaste Services Limited</a>
201810169	<a href="#">A New Zealand Limited Partnership</a>
201900033	<a href="#">Goodman Nominee (NZ) Limited</a>
201900044	<a href="#">Pan Pac Forest Products Limited</a>
201900072	<a href="#">The Neil Group Limited</a>
201900187	<a href="#">DI (FH) Johannes Trauttmansdorff-Weinsberg</a>
201900218	<a href="#">Kaiwaka Joint Venture</a>
201900232	<a href="#">China Forestry Group New Zealand Company Limited</a>
201900257	<a href="#">New Zealand Forest Industries Limited</a>
201900271	<a href="#">Sime Darby Berhad</a>
201900305	<a href="#">Neil Construction Limited</a>
201900317	<a href="#">DI (FH) Johannes Trauttmansdorff-Weinsberg</a>
201900359	<a href="#">Wolfgang Leitner</a>
201900364	<a href="#">Al Sky UK Bidco Limited</a>
201900365	<a href="#">Universal Homes Limited</a>
201900384	<a href="#">Matariki Forests</a>

Figure 2:

Monthly report containing advertisements

<https://www.linz.govt.nz/overseas-investment/decision-summaries-statistics/2019-09>

(Access date: 20.07.2022)

Decision	Consent granted Section 12(a) Overseas Investment Act 2005
Decision Maker	Overseas Investment Office
Decision Date	6 September 2019
Pathway(s)	Sensitive land – special forestry test
Investment	An overseas investment in sensitive land, being the Applicant's acquisition of a freehold interest in approximately 1,663 hectares of land located at: <ul style="list-style-type: none"> <li>• Braid and Fox Roads, Wyndham, Southland (known as 'Hillfort Forest'); and</li> <li>• 625 Cumming Road near Lumsden, Southland (known as 'Wether Hills Forest').</li> </ul>
Consideration	\$46,000,000

Figure 3: A single published asset transaction has two locations. URL disguised

(Access date: 20.07.2022)

Figure 2 shows the monthly report on decision summaries. Figure 3 shows a decision summary for two locations and the total investment amount (gross), but not the size of the plot of land transacted. These aforementioned information gaps were addressed through extensive research, such as searching an investing company's website to track its business operations, CAFCA statements, press articles and other Google searches. When compiling the data set it could happen that either the information on the investments made was published but not the hectares of the land transacted, or vice versa. In the best case, both pieces of information were published. In cases where information on plot size could not be found and therefore the purchase price could not be weighted by land area, the price was divided by the number of sites per decision summary ("advertisement"/abbreviated as "ad") in order to maximize the sample size.



## -Weighting method

Table 1 outlines the weighting method to simulate the geographically adjusted purchase price (allowing us to roughly visualize where how much money enters the “Kiwi countryside”):

Table 1: Weighting scheme

Example ad A: Purchase price (PP) 100 \$	Example ad B: Purchase price (PP) 50 \$	Example ad C: Purchase price (PP) 1000 \$
Location – I = 80 hectares Location – II = 20 hectares <b>Sum = 100 hectares</b>	Location – I = 80 hectares <b>Sum = 80 hectares</b>	Location – I: 55 hectares Location – II: 20 hectares Location – III: 70 hectares Location – IV: 100 hectares <b>Sum: 245 hectares</b>
<b>Location – I / Sum = Weighting I</b> 80 hectares / 100 hectares = 0,8  <b>Location – II / Sum = Weighting II</b> 20 hectares / 100 hectares = 0,2	<b>Location – I / Sum = Weighting I</b> 80 hectares / 80 hectares = 1	<b>Location – I / Sum = Weighting I</b> 55 hectares / 245 hectares = 0,2245  <b>Location – II / Sum = Weighting II</b> 20 hectares / 245 hectares = 0,0816  <b>Location – III / Sum = Weighting III</b> 70 hectares / 245 hectares = 0,2857  <b>Location – IV / Sum = Weighting IV</b> 100 hectares / 245 hectares = 0,4082
<b>Weighting I * PP = EP I</b> 0,8 * 100 \$ = 80 \$  <b>Weighting II * PP = EP II</b> 0,2 * 100 \$ = 20 \$  <b>* Estimated Price for plot of land (EP)</b>	<b>Weighting I * PP = EP I</b> 1 * 50 \$ = 50 \$	<b>Weighting I * PP = EP I</b> 0,2245 * 1000 \$ = 224,5 \$  <b>Weighting II * PP = EP II</b> 0,0816 * 1000 \$ = 81,6 \$  <b>Weighting III * PP = EP III</b> 0,2857 * 1000 \$ = 285,7 \$  <b>Weighting IV * PP = EP IV</b> 0,4082 * 1000 \$ = 408,2 \$
Location – I and II cost 80 \$ and 20 \$ respectively.	Location – I and II cost 50 \$.	Location – I, II, III and IV cost 224,5 \$, 81,6 \$, 285,7 \$ and 408,2 \$ respectively.

#### 4) Gross and net values of hectare size and purchase price, the problem of double counting and the aggregation of production and processing

##### -Gross and net values of hectare size and purchase amounts

With regard to the hectare size and purchase price of land acquisitions, gross and net quantities differ from each other.

The first ones refer to all transfers between overseas and national investors and are therefore considered as a full count regardless of who buys from whom.

The second refer only to land transfers where exclusively an overseas investor has bought a piece of land from a national investor. This counts as a proxy for "land alienation" (admittedly eschewing the questions of previous settler-colonial land alienations) that can be used to estimate the loss of land from domestic individuals to overseas investors. As we explain further below, we deliberately also count cases where e.g., a milk processing plant plus the land surrounding it was acquired by a foreign investor, as well as cases of forestry investment. This allows us to arrive at a more comprehensive picture of how many nature-based resources and productive capacities have moved to foreign ownership.

The aforementioned gross and net distinction is also applied to the investments amount. Again, OIO data refers only to investments whose ownership is at least 25 per cent foreign or if the company is based abroad. Furthermore, only investments in so-called "sensitive land" require the approval of the OIO and are therefore published. This means that transfers between New Zealanders are not captured in our data set.

In this project, predominantly *gross land acquisition* and *investments* and not the *net values* were used for the graphs.

Figures 4 and 5 show the volumes and differences in terms of gross and net land acquisition and investment.

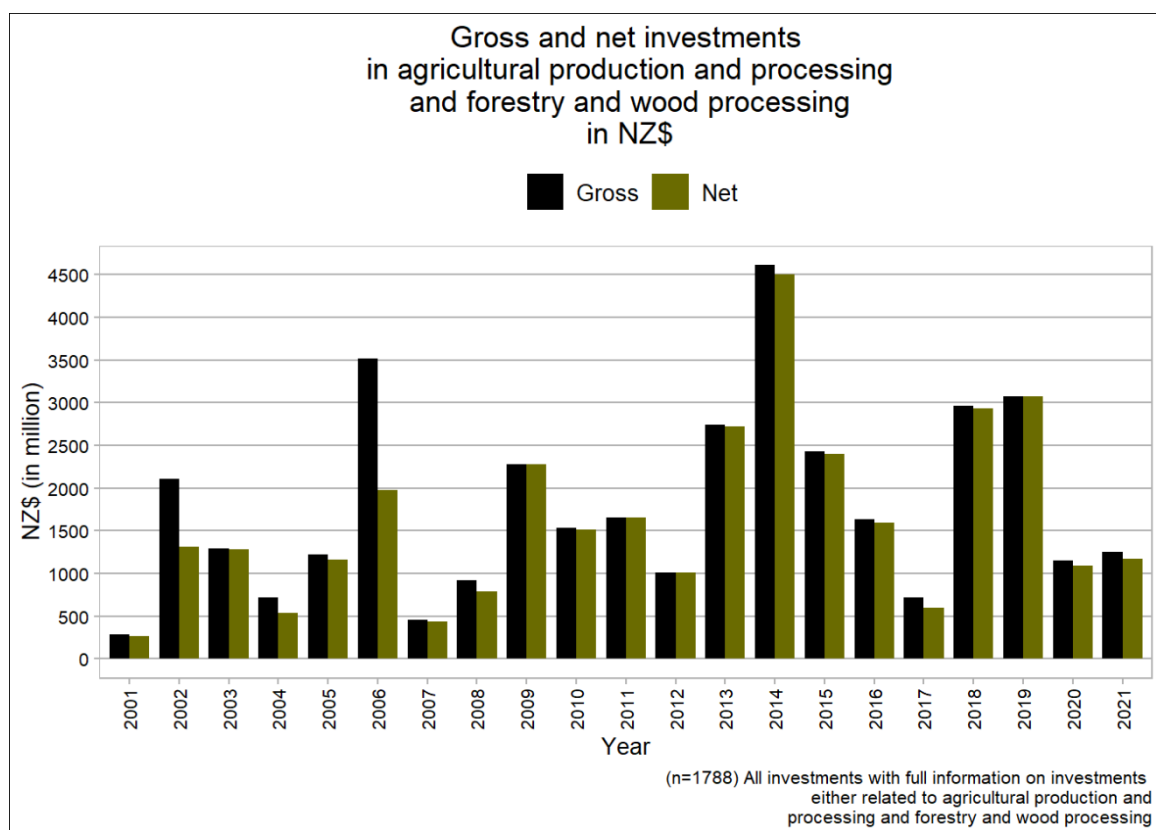


Figure 4: Gross and net investments in *Agr. p&p* or *For. & wp* (own elaboration)

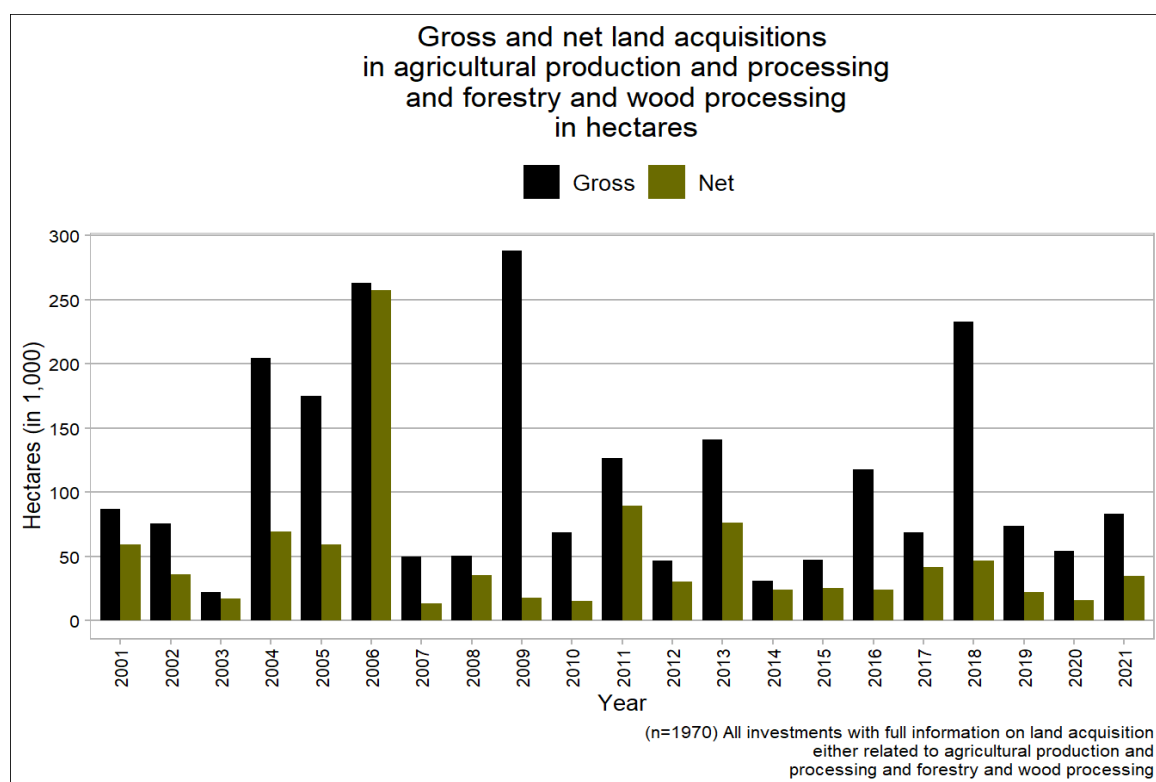


Figure 5: Gross and net land acquisitions in *Agr. p&p* or *For. & wp* (own elaboration)

## - The problem of double counting

Occasionally, there are some advertisements corresponding to “agricultural production and processing” and at the same time to “forestry and wood processing” (*For. & wp*). 84 investments out of a total of 2119 investments are double-counted ( $2119 - 84 = 2035$ ), i.e., they are simultaneously considered as “*Agr. p&p* and *For. & wp*”. For these advertisements, no distinctions between the size of the hectares transacted and the money spent can be made.

On the one hand, the total count is inflated due to double counting. On the other hand, since the OIO does not always provide information on how land with a potential double use is eventually utilized in use percentage terms, we decided to count them twice, as *Agr. p&p* and *For. & wp*. It should be borne in mind that the way OIO has documented transactions has been varying over time. Therefore, we opted for a more consistent sampling strategy by not displaying differences in land use shares of each economic activities since this information was not available in a consistent manner. Overall, our priority was uniform data set.

These simultaneous investments exist because sometimes the investor has committed himself or has undertaken to manage a forest area and an agricultural area at the same time. Sometimes this is explained by ecological reasons, because the government via the OIO granting conditions wants to force companies to afforest, effectively treating the agricultural land sold (at least partly) as forest land.

Note that we also accounted for agricultural or forestry assets that have been transferred more than once and may thus inflate numbers. We could only do so for data that was fully georeferencable, which only applies to the data collected between 2006 and 2021 ( $n = 1343$ ). Cases which were sold more than once amounted to 6.4% ( $n = 84$ ) of all transactions recorded during this period. We do not provide accounts of assets that may have been transacted multiple times. Even if double/multiple counts (including those not captured for the period 2001-2005) may slightly inflate figures, repeated transactions in land can still be read as an indicator for the foreignization of agricultural and forestry land and ventures in Aotearoa New Zealand.

Figures 6 and 7 show the distribution of gross investment across the different sectors and illustrate the magnitude of double-counted investment.

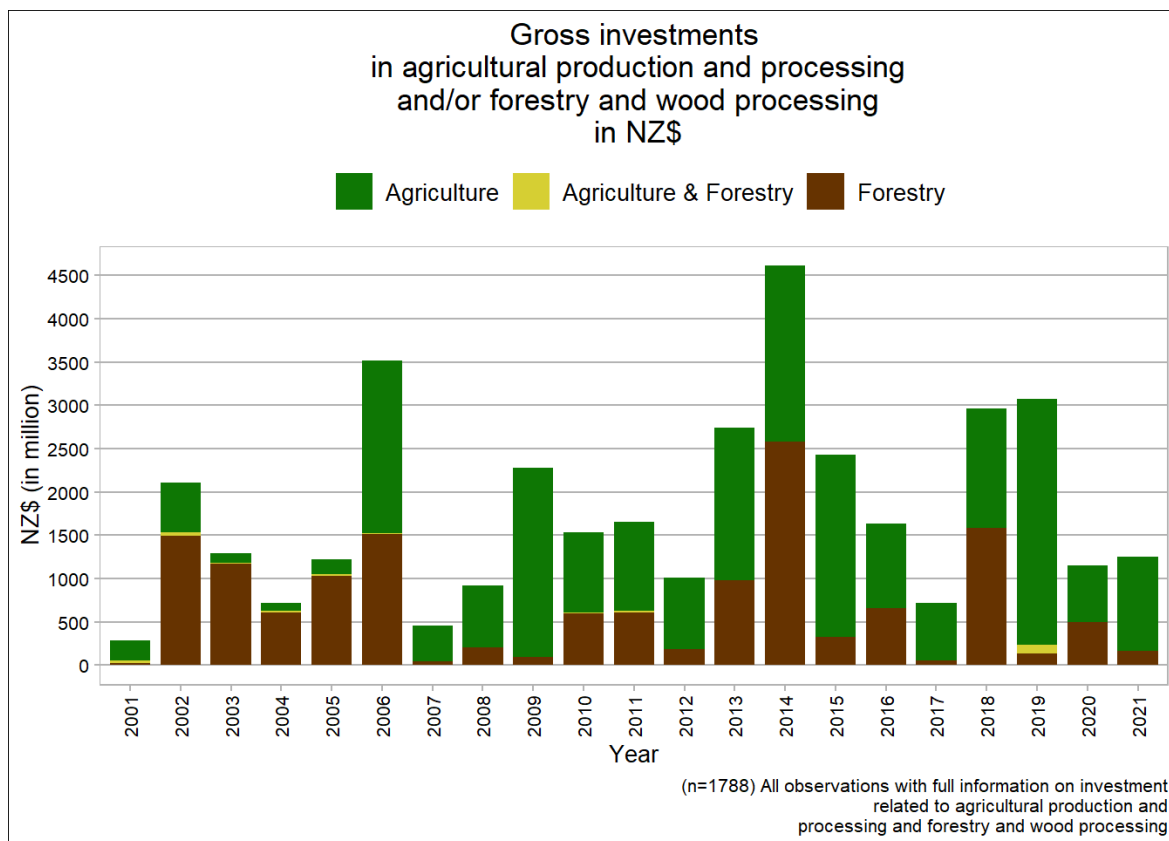


Figure 6: Gross related to Agr. p&p or For. & wp (own elaboration)

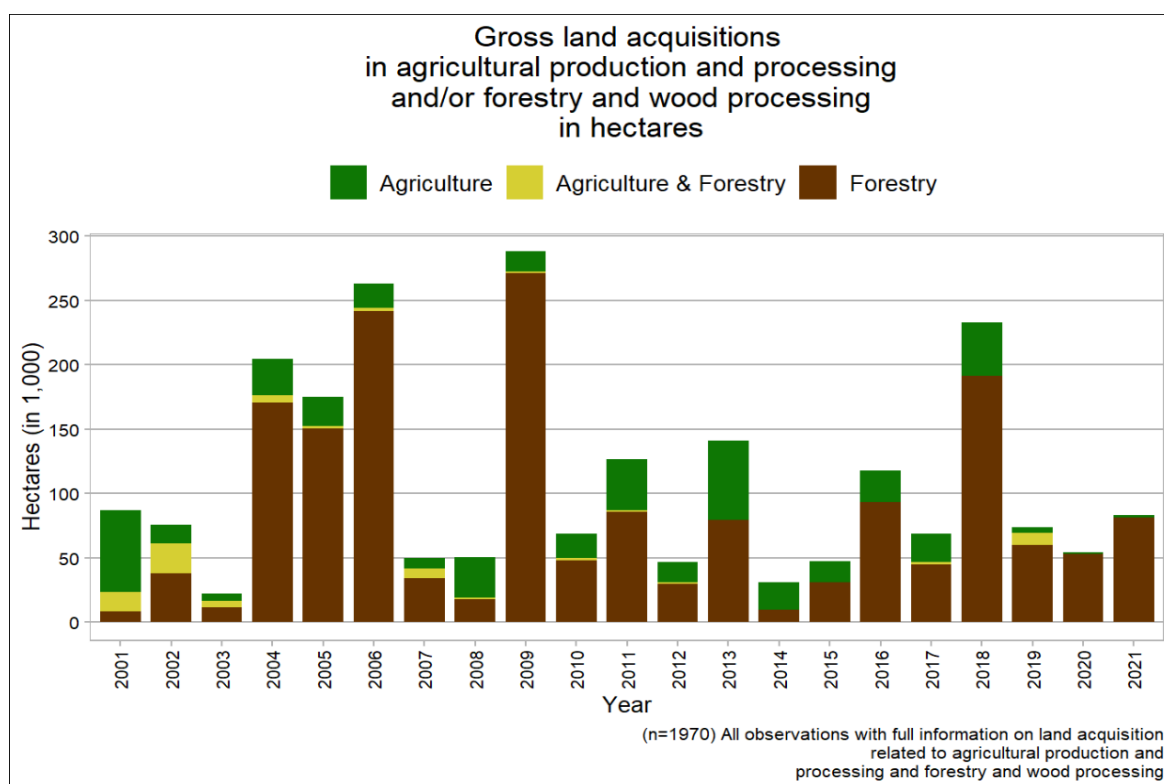


Figure 7: Gross related in Agr. p&p or For. & wp (own elaboration)

## -Aggregation of production and processing

In addition, the two main sectors (*Agr. p&p* or *For. & wp*) were combined broadly without distinguishing between *production* ("agriculture and forestry") and *processing* ("food processing or wood processing").

We decided for this simplification because, first, some companies or funds targeting (farm-)land have diversified their activities along the supply chain (e.g., by investing in technological improvements or shortening the distances between production and processing). Secondly, some agricultural ventures such as the ones in the wine industry blur both domains.

Thus, we have paired and display investments in dairy farming, sheep, beef and cattle farming, viticulture and other agriculture *with* production of lactose products, meat processing, viticulture again and further processing. In case of *For. & wp.* sector, we have combined the investments in forestry and wood and timber processing.

However, we have not considered investments that do not fit into the above-mentioned business domains. This includes for example global beverage companies. It is important to note that transfers in logistics, services, retail, construction, infrastructure or healthcare are not included either.

Nevertheless, our data collection still accounts for differences between production or processing. This means that we can estimate the share of processing activities in the total investment in both sectors. According to our sample, about 21 % and 12 % of the observations are related to the processing part in *Agr. p&p* and *For. & wp*, which **means economic activities that are primarily land-based and land-intensive make up a significant part of our sample**. This is visualized in Figures 8 and 9.

Besides the mapping of the sectors activities, where the said aggregation is implied, the differentiation between production and processing are shown in Figures 8 and 9 give an overview of differences between production and processing across the agriculture and forestry subsectors. We should note that it is the category of agricultural "production" that normally attracts the view of "land rush"/"land grab" scholars, less so the category of processing, leave alone the subsector of forestry.

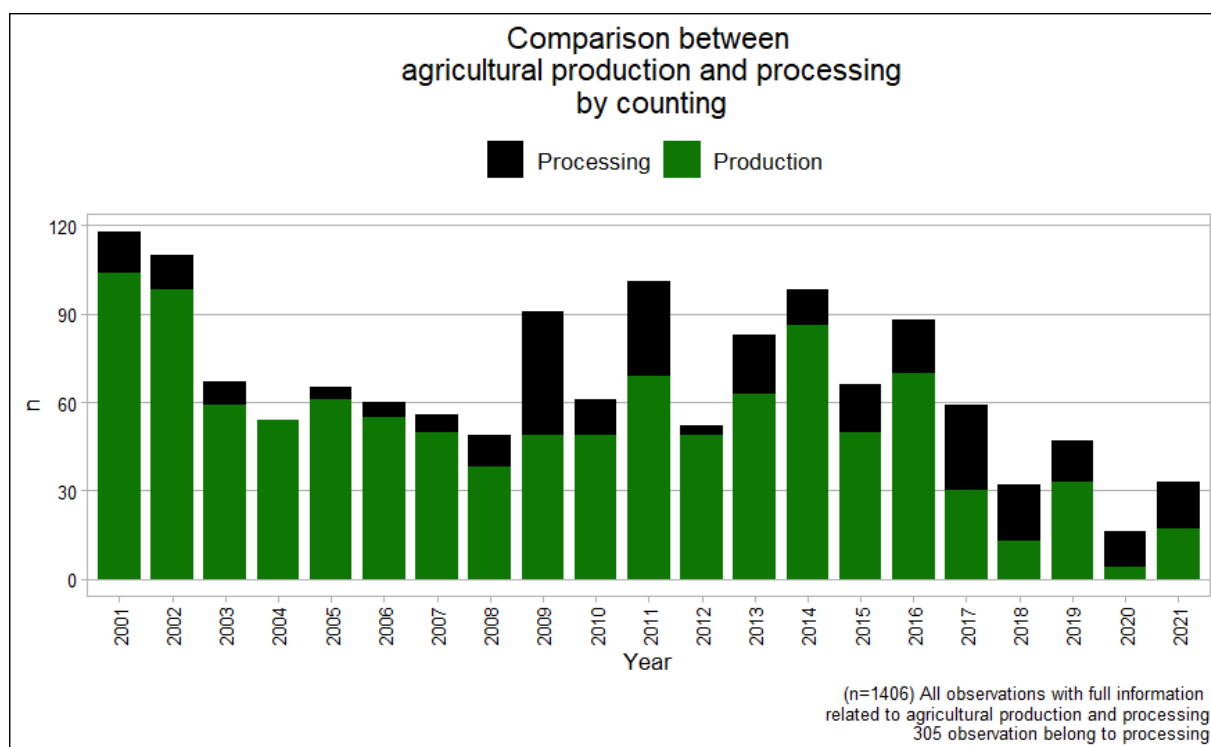


Figure 8: Counts of investment cases related to Agr. p&p (own elaboration)

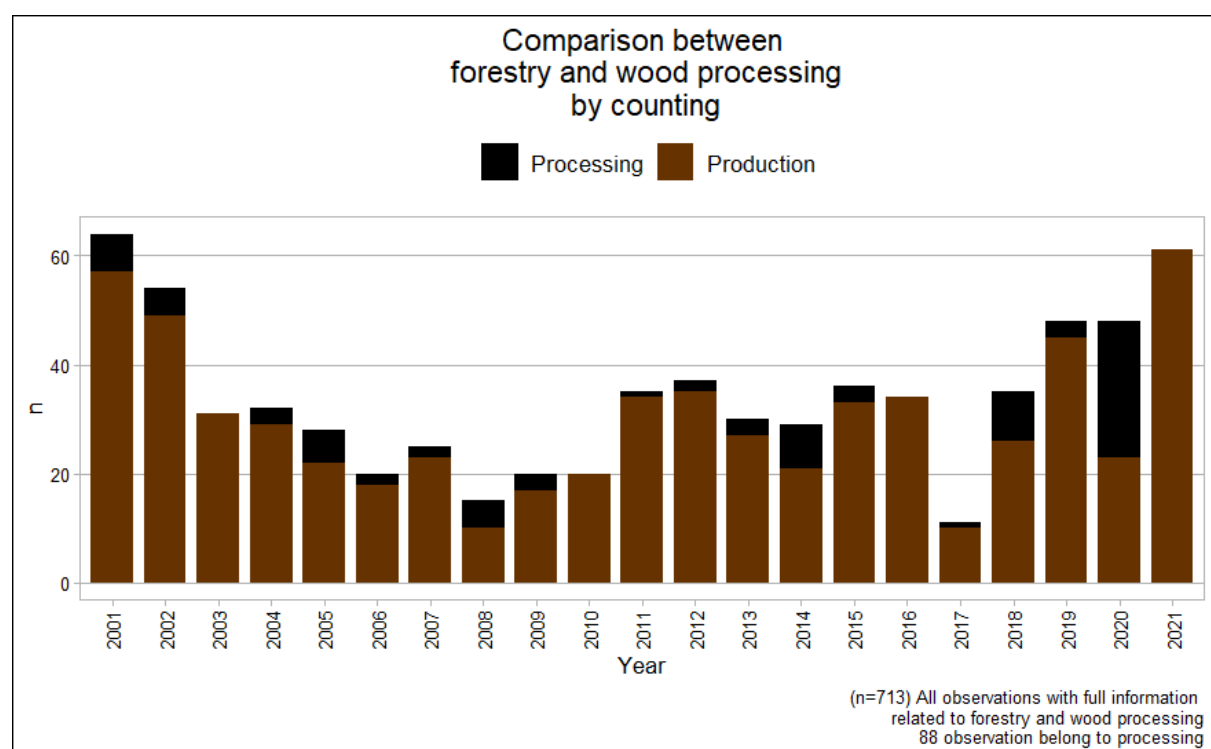


Figure 9: Counts of investment cases related to For. & wp (own elaboration)

## 5) Data validation

Subsequently, the data set was corrected, e.g., if older information published on the OIO page became updated (e.g., in comparison to the data set Tobias Klinge used). In addition, the above-mentioned sources and the press were used to complete missing values such as the purchase amount or the hectare area. Furthermore, this broader information base has also allowed us to determine the investor type (investor class) over time. This means that we were able to reliably examine the investor type and its corresponding transacted purchase amount and area based on the investors' business history. More detailed notes including hyperlinks for the complete documentation of transfers were noted in a list and can be requested as needed.

Once the database was ready, Tobias Klinge's thematic areas could be updated and expanded to include the georeferenced data component. Step by step, printed and interactive maps, diagrams, GIFS and finally the ShinyApp were developed. By developing different visualisation formats which enabled us to have a clearer overview of our samples, we were able to evaluate our results and even account visually for outliers. This last step can be seen as an evaluation of the whole process, as it allowed us to pay attention to the plausibility of the results in general.

## 6) A guide to each variable

Any land transfer or land acquisition, which can be equated as an observation includes:

### ◆ Registration number on OIO

Each advertisement was assigned a registration number by the OIO. Until 2008, a second identification number was assigned to each ad

### ◆ Temporal aspects

Day, month and year are extracted from OIO monthly publications. The compiled database contains data from 2001 to 2021. As mentioned above, we used data from CAFCA to fill gaps between the years 2001 to 2004 (which collected its own data, partly based on the work of OIO's predecessor – the Overseas Investment Commission). However, we also use CAFCA data to validate OIO data in later years. In contrast to the OIO, the civil society organization CAFCA publishes its monthly report a few months later than the OIO does. This is largely owed to the fact that it spends time on validating the information that the OIO is providing.

### ◆ Buyer and seller

Related parties in the business transaction. In this project, we have explicitly hidden the applicant's name (buyer) and the vendor's name.

### ◆ Ownership shares according to regions

Most transfers are managed by investors mainly from specific regions. These include Australia, China, EU-15, USA, Canada, Asia, various (specified by OIO) and others (aggregated by own elaboration)



### ◆ Leasehold and freehold

The land acquisitions are traded for lease or freehold ownership. It should be noted that acquiring a piece of land for leasing is easier than buying. When purchasing land, contractually agreed ecological or commercial funding requirements, set and (theoretically) monitored by the OIO, must be met.

### ◆ Gross and net values of hectare size and purchase amounts

[See point 5](#)

In this project, the gross land acquisition and investments and not the net values were during the production of graphs.

### ◆ Hectare size order





In order to group together the different plot sizes for both sectors and to better understand the distribution of land acquisitions in New Zealand, a number of categories have been defined:

Table 2: Gross and net land acquisitions in Agr. p&p or For. & wp own elaboration

Agr. p&p (in hectares)	Group	For. & wp (in hectares)	Group
<=5	1	<=25	1
5.1 – 25	2	25.1 – 100	2
25.1 – 50	3	100.1 – 250	3
50.1 – 100	4	250.1 – 500	4
100.1 – 250	5	500.1 – 2500	5
250.1 – 500	6	2500.1 – 10000	6
500.1 – 1000	7	>10000	7
> 1000	8		

### ◆ Investor classification

Table 3: Investor classification in Agr. p&p or For. & wp own elaboration

Agrobusiness companies	Asset-manager-driven investment	Individual investor	*New Zealand carbon farming
(i.e., genuinely agricultural companies of all sizes)	i.e., shareholder-driven investments by investment entities such as public and private pension funds or other asset management companies like institutional investors or others	i.e., individual farmers and/or high net-worth individuals	(i.e., companies participating in reforestation at the initiative of the State of NZ to offset their footprint).
			

\* The New Zealand Carbon Farming Investor will only be available in the *For. & wp.* sector included.

Investor type is an important but complex category, which eventually allows us to discriminate between those actors who are more or less genuine agricultural companies (even though they might be stock market listed) from those that can be deemed to be more driven by institutional investors/asset management companies.

The examination of the investor class followed a sequence of multiple criteria. Firstly, the way the OIO titles the applicant. Secondly, the name of the buyer itself. Thirdly, the original business field and investment strategy of the company in question. Finally, the shareholding ties of an investing company were used to determine its investor class.

In case the OIO decision summaries did not contain enough information, we resorted to CAFCA reports to find out more about the transfer and the conventional business areas of an investing company. In addition, we applied the "follow the money" criterion, i.e., we examined the areas in which the companies invest, to finally determine whether they belong to the traditional agribusiness or to a class of investors that is more driven by capital markets, be these pension funds or stock markets. Transfers in which a non-agricultural or -forestry shareholder was significantly involved, or transfers of companies in which a non-agricultural or -forestry shareholder sits on the management board, were classified as asset management-driven investments. Based on this logic, stock market listed companies in our sample are counted under the moniker of "asset-manager-driven investments" when there is a significant share of institutional ownership. For instance, the investment of the dairy company Danone in a NZ dairy company can be counted as asset-manager-driven due to significant shares held by asset management companies. Thus, we do not just focus on asset-manager-run agricultural funds as avenues for the flow of money into the Kiwi countryside, but also on stock markets. Thus, we take a broader view on the financialization of farming and agriculture. Eventually, this allows us to compare investors who have traditionally been involved in both sectors (Agr. p&p and For. & wp) with those who diversify their portfolio as part of a financial expansion, regardless of which sectors they are involved in.

We also include carbon farming as a potential domain of investment in our sample because of the New Zealand government's afforestation policy after decades of promoting farmland agriculture. Although it is a country of 5 million people, it produces enough food to feed about 40 million people. The emissions-intensive agricultural activities of recent decades have led to ecological depletion, raising serious concerns about adapting the economy to a more sustainable form in the wake of climate change.

Therefore, the New Zealand government has decided that New Zealand should achieve a net-zero emissions balance by 2050 through various measures. These include the Emissions Trading Scheme (ETS), which creates incentives for companies to systematically plant trees to offset their carbon footprint. The ETS is to be understood as a market-based solution in which the majority of companies are allocated emission credits that entitle them to pollute. Companies that do not pollute as required can sell carbon credits to polluting companies. Alternatively, companies that pollute heavily can limit their pollution by engaging in forestry activities.

This can be seen as a breakthrough for many reasons, as forestry is becoming more in demand, attracting speculative investment, and many traditional farmland workers are losing their jobs. We have chosen to include this new type of forestry management in order to track the development of managed NZ government.

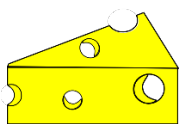

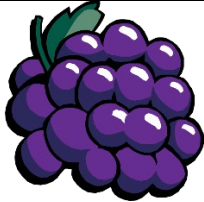
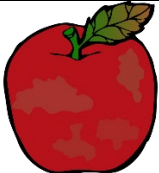
#### ◆ Correspondence to Agr. p&p and For. & wp. and, if applicable, Agr. p&p sub-sector

As already indicated, all investments are divided sectorally into *Agr. p&p* and *For. & wp.* In the course of simplifying the economic processes, production and processing have been combined.

For instance, keeping livestock and processing dairy products, keeping beef, sheep and cattle and slaughtering and processing meat, production of fruits and processing into drinks, and growing and processing wine (and other remaining agricultural activities) are assembled under a meta category. In forestry, the cultivation of trees is equated with the processing of wood for housing and packaging.

**Within Agr. p&p, four subgroups (subsectors) have been highlighted:**



Table 4: Agr. p&p subsectors (own elaboration)

Dairy related sector	Sheep, beef, cattle livestock-related sector	Viticulture sector	Other together aggregated agriculture*
			

\*In the last subgroup include, among others, agricultural activities such as: fishing, breeding horses, orchards, gardening, growing flowers, beekeeping

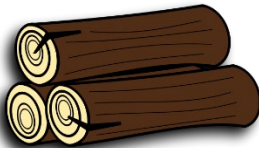

Furthermore, we differentiate visually in the "*Agr. p&p*" category between the investments on the production and on the processing side.

Table 5: Agr. p&p division in production and processing (own elaboration)

Production	Processing
	

In contrast, for the forestry and timber subsector, we visually differentiate between forestry and wood and timber processing.

Table 6: For. & Wp division in production and processing (own elaboration)

Forestry	Wood processing
	

#### ◆ Location of investments

The investments observed are classified according to the administrative level of the regional councils. The following regions are considered:

-On the North Island: Northland, Auckland, Bay of Plenty, Gisborne, Hawke's Bay, Waikato, Taranaki, Manuwatu-Wanganui, Wellington

-On the South Island: Marlborough, Nelson, West Coast, Canterbury, Otago, Southland

If you have any questions, please contact [sebastiandelaserna@hotmail.com](mailto:sebastiandelaserna@hotmail.com)

Sebastian de la Serna and Stefan Ouma, 30/08/2022