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Assigned to Favourable Sites? What Spatial Analyses Can Reveal about Place-Names Ending in *-bólstaðr* and *-staðir*

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Introduction

Place-name research is, at the outset, a linguistic discipline of profound interdisciplinarity. To be able to interpret a place-name and understand the context in which it was coined, the name researcher must be a jack of all trades. Albeit specialised in linguistics, the name researcher also needs to have a broad insight into history, archaeology, history of administration, geography, biology, etc. Interdisciplinary interaction is always present in toponymic research, with new insights from relevant disciplines needing to be considered in an onomastic light. This makes place-name research ever dynamic in nature.

Over the past many years, Norwegian place-name research has mainly focused on securing the country's rich treasure trove of minor names before they vanished. Part of the reason can be found in the fact that Oluf Rygh's *Norske Gaardnavne* (Norwegian Farm Names), in having dealt with most settlement names, gave little reason for national and systematic research into settlement names and corresponding name types.

One notable exception is the handbook *Norsk stadnamnleksikon* ('Norwegian Place-name Lexicon'),[1] which provides a general overview of the Norwegian place-name stock, from regional names to the names of municipalities, cities, towns, settlements, and natural features. However, *Norske Gaardnavne* remains the main Norwegian source for settlement names.

The nineteen volumes of *Norske Gaardnavne* were published from 1897 to 1936 (and reprinted twice).[2] The series was then digitised around the turn of the millennium and has now been georeferenced as part of its digital relaunch. When the place-name archive, alongside the other constituents of the Norwegian Language Collections, was transferred from the University of Oslo to the University of Bergen, the digitised *Norske Gaardnavne* was singled out for upgrading and georeferencing. This effort has made it possible to see and research place-names and place-name types in their spatial context and to link these to information about cultural and natural phenomena, archaeological finds, as well as cadastral, statistical, and administrative data.

The obvious advantage of a georeferenced *Norske Gaardnavne* is the possibility of making distribution maps to show such things as period-specific settlement name distributions, as well as distributions of typologically and semantically similar place-name types. However, to illustrate the full potential of this work, the dataset from the new digital *Norske Gaardnavne* will be coupled to cadastral and land-resource information. The aim is to demonstrate how the digitisation and georeferencing of *Norske Gaardnavne* can be used in advancing place-name research and other research fields. The focus will be on showing the relevance of spatially enabled place-name resources,

1. Stemshaug and Sandnes 1997.
2. Rygh 1897–1936.

and how to combine these with modern cadastral data and resource-management data to make retrogressive analyses[3] of two Viking Age place-name types, *bólstaðr* and *staðir* (m.), in order to gauge their status and significance.

The basis for the study: *Norske Gaardnavne*

The place-name series *Norske Gaardnavne* is based on the place-name standardisation work carried out in connection with a cadastral revision.[4] In 1863, the Norwegian parliament commissioned a general revision of the Norwegian cadastre of public and private lands to allow for consistent land-ownership records, and to revise land taxation in Norway. Another intention of this work was to correct inconsistencies and errors in the spelling of place-names from earlier cadastres.

In 1878, Professor of Archaeology Oluf Rygh, Professor of Linguistics Sophus Bugge, and the Old Norse expert Johan Fritzner were appointed members of a commission to do this spelling revision of the cadastre. At the time, there was no officially sanctioned standard of written Norwegian. This caused challenges to the standardisation effort. Rygh, Bugge, and Fritzner realised that, since most Norwegians spoke their own dialect, the best way to establish a correct spelling of a place-name was through the local, inherited pronunciation. To accomplish this, the commission recorded place-name pronunciations used among ordinary people in everyday conversations.

3. The retrogressive method provides a means of studying spatial-historical phenomena by using data or evidence from a younger time period to analyse earlier spatial conditions. Cf. e.g. Antonson 2018.

4. In Norway, all real estate must be registered in *Norges Matrikkel* (the Norwegian Cadastre), the official property register. The cadastre provides an overview of properties, property boundaries, addresses, and buildings that are necessary for planning, development, use, and protection of real estate.

Differences were observed regionally as well as between urban and remote areas.[5] Through this effort, they found consistent relationships between current oral forms of place-names and the original names as found in both the current parish records and in historical sources.

The main tool for establishing the origin and etymology was to record the names found in historical sources. The commission reviewed several sources, such as *Diplomatarium Norvegicum* and old land records like *Aslak Bolts jordebok*, *Biskop Øysteins jordebok* (*Røde bok*), *Oslo Kapitels Gods jordebok*, *Olaf Engelbrektsens jordebok*, *Bergens kalvskinn*, and the cadastral works from 1665 and 1723.

This monumental work was completed in 1882, in time for the new cadastre to be published in 1886. However, realising the potential of the work and methodology of the linguistic revision of the cadastre, the parliament allocated funding in 1896 to publish the revised place-names in an academic series. The first volume of the series *Norske Gaardnavne* was published in 1897. The series is published in county (*amt*) volumes and is structured according to local government areas (*herred*), thus mirroring the structural framework of the 1886 cadastre. There is a further subdivision into parishes, although this division is not directly relevant to the cadastre. Each cadastral unit of significance – farm settlement areas (*gard*) as well as many individual farm holdings (*bruk*) – features a section preceded by their cadastral number, followed by the standardised place-name as section heading. This, in turn, is followed by pronunciation information, source forms, and an etymological

5. Cf. University of Bergen, Norwegian Language Collections: The Place-Name Archive, SPR/A-0003/O/Oa/L0001, an original manuscript by Oluf Rygh submitted to the Cadastral Commission, 10 June 1882. https://www.arkivportalen.no/entity/no_SPR_arkiv000000028351. Accessed 16 May 2022.

description. In this way, *Norske Gaardnavne* documents almost 61,000 settlement names.[6]

Norske Gaardnavne had a monumental significance for place-name research in north-western Europe, as its etymological interpretations originated in scientific linguistic principles based on pronunciation and a detailed compilation of written records on land ownership. Not only did this establish a standard for scientific and systematic place-name research, but the concept also became the inspiration for similar studies in e.g. Denmark (*Danmarks stednavne*), England (*Survey of English Place-Names*), Scotland (*The Survey of Scottish Place-Names*), and Sweden (*Sveriges ortnamn*).

The next step: digitising *Norske Gaardnavne*

Norway has been at the forefront of digitising central historical sources. As early as 1981, the Registration Centre for Historical Data was established at the University of Tromsø, with the aim of creating a national population register. One of their digitisations was the 1886 Cadastre (*Matrikkelen av 1886*). A few years later, in the mid-1990s, the *Dokumentasjonsprosjektet* (the Norwegian Documentation Project)[7] began mass-digitising central sources, including *Norske Gaardnavne*, which has been digitally available for almost twenty years. So far, no attempt has been made to link these digitised sources together or to link historical cadastres to the modern, spatially enabled cadastre. The main reason for this is that the Norwegian cadastral

6. The digitised volumes of *Norske Gaardnavne* are freely available at the *Nasjonalbiblioteket* (Norwegian National Library). https://www.nb.no s.v. Norske Gaardnavne. Accessed 15 May 2022.
7. 'Dokumentasjonsprosjektet', https://www.dokpro.uio.no. Accessed 15 May 2022.

code system is dynamic,[8] which poses a serious limitation on historical-administrative research. Even though the current cadastral system was only introduced in 1886, the consequence is that interlinking or merging with modern cadastral data or modern coordinate data has been nigh on impossible – until now.

With the transfer of the Norwegian Language Collections from the University of Oslo to the University of Bergen in 2016, the opportunity arose to reorient the Norwegian Place-Name Archive and to upgrade and modernise the collections. Having established an overview, the decision was made to begin the modernisation with the cadastre and related works. However, to be able to furnish the cadastre with coordinates, it was necessary to introduce a means of managing cadastral information over time. In 2018, Kåre Bævre, of the *Folkehelseinstituttet* (Institute of Public Health) in Oslo, provided the Language Collections with a copy of his work on the historical cadastre, which made it possible to combine cadastres over time. I have subsequently upgraded the historical cadastre and assigned precise coordinates to cadastral records. Thus, it has been possible to georeference the 1886 Cadastre, as well as all the other digital historical cadastres from 1838 to 2010. All other historical and administrative resources that make use of the cadastral system, such as censuses and statistical accounts – and *Norske Gaardnavne* – were also able to be georeferenced according to the same principles.[9]

The work was undertaken in several stages. Since the cadastre documents property history, it was necessary to first

8. The Norwegian cadastre code is based on the current local government code. Hence, as the local government system has undergone both reforms and individual revisions, each cadastral number has, on average, been amended three times since the establishment of the current cadastral numbering system in 1886.
9. Gammeltoft 2021: 81.

introduce a unique cross-historical cadastral code (*historisk matrikkelnummer*) at the level of individual farm holdings (*bruk*), as well as a code to manage the cadastral farm (*gard*) or township (*historisk gardsnummer*). This was then applied to each historical cadastre since 1838. The historical cadastral code ID is composed of a twelve-digit code system, i.e. four digits for the *kommunenummer* (local government code) + four digits for *gardsnummer* (cadastral farm code) + four digits for *bruksnummer* (individual farm holding/cadastral code). The higher farm-level ID consists only of eight digits for the *kommunenummer* + *gardsnummer*.

After the 1886 Cadastre and *Norske Gaardnavne* had been coded with historical cadastral and farm codes, all farms and single holdings could be assigned point coordinates harvested from the modern cadastre. The point coordinate deposition was quite complicated. However, it was possible to designate coordinates to some 99.2% of the cadastral units treated in *Norske Gaardnavne*.

The result, as shown in Figure 1, is a complete and full localisation of Norwegian farm names in all of Norway, apart from Finnmark (which did not have the same cadastral system as the rest of Norway until the second half of the twentieth century). As the figure also shows, the concentrations vary considerably from region to region. The greatest concentrations are found in the Viken area around the Oslofjord, the Mjøsa region north of Oslo, as well as on the southern tip of Norway between Kristiansand and Flekkefjord. Lower concentrations can be found along the entire coast and fjords of Vestlandet, Telemark, central Trøndelag, and – to a lesser degree – in southern Nordland. These concentration areas correspond to the main agricultural areas of Norway.[10]

10. OECD 2021: 37.

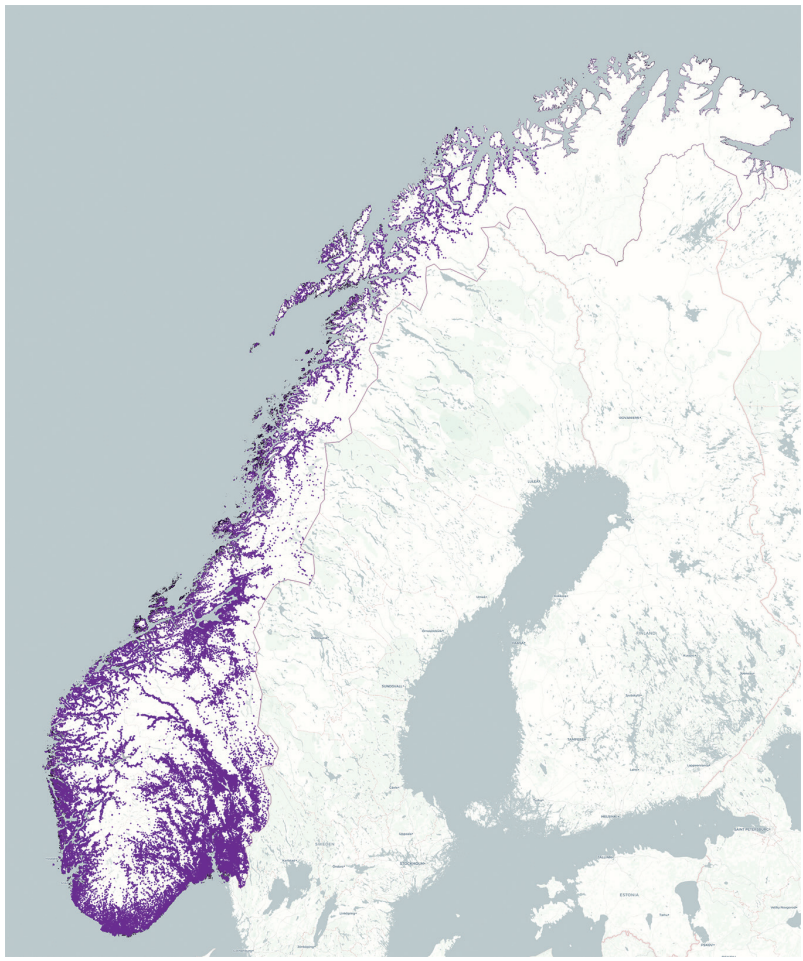


Figure 1: Point map of place-names in Oluf Rygh's *Norske Gaardnavne* (1897–1936), except for Finnmark. This volume has not been digitised. In addition, this county did not have the same cadastral system as the rest of Norway, making georeferencing very difficult. Basemap: Carto Positron, CartoDB (CC-BY). Overlay: Peder Gammeltoft.

The new, spatially enabled digital *Norske Gaardnavne*[11] differs somewhat from the printed series, as well as the initial digital version of *Norske Gaardnavne* of the *Dokumentasjonsprosjektet*.

11. *Norske stadnamn – Norske stedsnavn*, https://toponymi.spraksamlingane.no. Accessed 15 May 2022.

The printed volumes contained roughly 60,800 entries, consisting of farm names (c. 40,000), single holdings (c. 15,600), settlements no longer in existence (c. 4,200), as well as administrative names, such as parish (*sogn*) and local government area (*herred*) names (c. 1,000). In the online version of *Dokumentasjonsprosjektet*, however, only farm names and single holdings are searchable, that is, a total of 55,600 items.

The new digital *Norske Gaardnavne* has one entry per place-name unit. Some 3,600 entries in *Norske Gaardnavne* cover several cadastral units, the so-called *navnegard* (multiple cadastral units with the same place-name origin, resulting from an early splitting up of a parent farm into two or more independent farm units). In the printed version, these are distinguished by having more than one cadastral farm number. This means that an additional 8,100 farm-name entries have been added to the dataset. In total, the new digital *Norske Gaardnavne* has c. 69,000 entries with cadastral information and coordinates.

How to determine the typical size of a Norwegian farm area (*gard*)

Today, the Norwegian cadastre is managed by the Norwegian Mapping Agency (*Statens kartverk*) as a digital cadastre. The cadastre is entirely managed as a system for individual land holdings. It is thus only possible to use the cadastre in unchanged form on individual cadastral units (*bruk*). There are no datasets or thematic GIS layers for higher-level *gard* cadastral units, thus making analyses at the farm level of *Norske Gaardnavne* impossible. To create a higher-level thematic cadastral layer, it was necessary to dissolve the 2.5 million cadastral *bruk* units into the 47,000 higher-level *gard* cadastral farm units of Norway. Needless to say, this was a monumental task, but one

which enabled not only the georeferencing of the Norwegian cadastre and *Norske Gaardnavne*, but also quantitative studies of farm-unit sizes and name types. The potential of this dataset is considerable, as it will enable the study of Norwegian place-names from different angles – and align these closer to computational onomastic studies, such as those carried out in Denmark.[12]

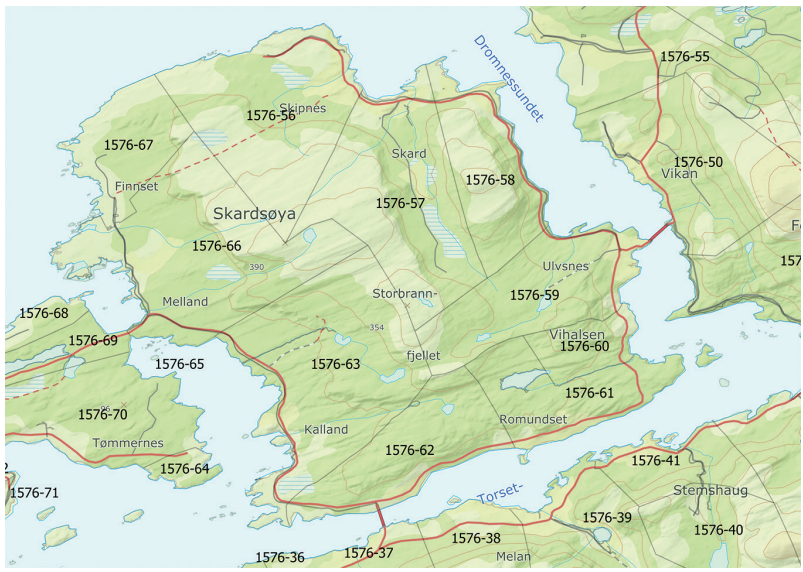


Figure 2: Map of section of Aure *kommune* in Møre and Romsdal. The grey lines represent cadastral farm-unit (*gard*) borders. The numbers represent the current farm-unit codes (*gardsnummer*). Basemap: Topografisk norgeskart, *Statens kartverk* (CC-BY). Overlay: Peder Gammeltoft.

This project is very much a work in progress, and the figures of the analyses may change slightly as the material gets progressively quality assured. To eliminate 'noise' resulting from aggregation errors and individual cadastral changes, the figures are calculated using the so-called Gaussian distribution model,

12. Cf. Jakobsen 2004, as well as Dam 2015, albeit with a slightly different focus.

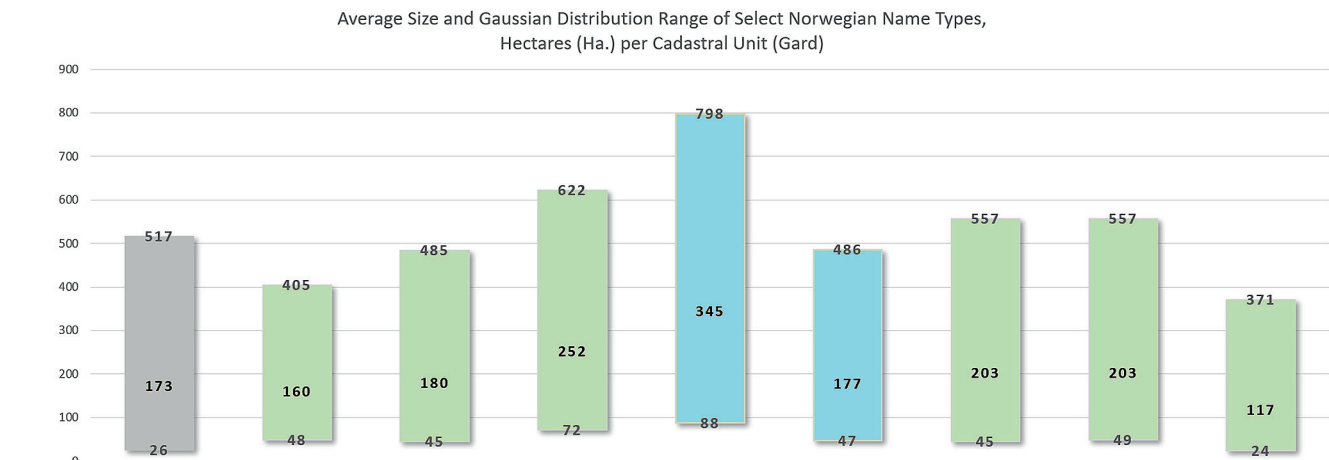
also called a normal distribution model. The model is mainly used in social sciences and natural sciences to calculate the general, typical distribution of independent, randomly generated variables from a central distribution range constituting 68% of the material. The distribution provides a parameterised mathematical function that can be used to calculate the probability for any individual observation from the sample to be within this range.[13]

This study operates only with national figures, although figures can, naturally, be calculated for any administrative level, from county level (*fylke*) through to local-government level (*kommune*). The national average *gard* cadastral farm-area size for Norway is 173 hectares (ha) – see grey column in Figure 3. However, the Gaussian distribution range is relatively broad, from 26 to 517 ha. The average resides in the lower half of the distribution range, signalling that the general size is more often under 173 ha than over.

The 'average farm' serves as the median by which to judge any place-name type regardless of number and distribution. The place-name types have been collated by consulting the individual place-name interpretations in *Norske Gaardnavne*. The interpretations have been aggregated from the general index volume of *Norske Gaardnavne* from 1936, individual textual interpretations, and from spellings. These still need to be independently verified, so final figures may vary slightly with time.

For this study, the focus will be on the place-name elements *bólstaðr* and *staðir*. However, to place them in a wider context, several place-name types have been analysed for comparison.

13. 'Normal distribution', *Encyclopædia Britannica*, https://www.britannica.com/topic/normal-distribution. Accessed 15 May 2022.



	AV. SIZE	VIN	HEIMR	LAND	BÓLSTAÐR	STAÐIR	SETR/SÆTR	ÞVEIT	RUÐ
Min.	26	48	45	72	88	47	45	49	24
Average	173	160	180	252	345	177	203	203	117
Max.	517	405	485	622	798	486	557	557	371

Figure 3: Diagram of selected Norwegian place-name types showing average and Gaussian distribution range of the overall size of the top-level *gard* cadastral farm units. The grey column represents the national average and distribution range. The blue columns constitutes the place-name types ON *bólstaðr* and *staðir* (m.), which are focused on in this study. The green columns are name types chosen for comparison. Diagram: Peder Gammeltoft.

The examples have been chosen to represent place-name types considered to belong to different time periods. In addition, ON *setr/sætr* (n.) has been chosen as an example of a place-name type in which the named localities were seemingly established with a greater focus on shieling economy. All elements are also found in the Scottish Viking Age colonies, although ON *vin* (f.) and *heimr* (m.) are only represented in limited numbers in the Northern Isles.

The elements ON *vin* (f.) and *heimr* (m.) represent typical pre-Viking Age settlement types. As such, it is only *heimr* (m.) that can be called a settlement name type, although it is questionable what the general meaning of the word 'home' really covers.[14] Is it the living quarters, the farm itself, or the resource area? ON *vin* (f.) originally designated a topographical feature, most likely some sort of grassland meadow or similar. At some time, these place-name types consolidated into farm settlements, akin to today's situation. The elements ON *land* (n.), *bólstaðr* (m.), and *staðir* (m.) represent the archetypal Viking Age settlement types. ON *land* (n.) is, like *vin* (f.), not really a settlement name type as such, but rather a topographical feature designating an area suitable for agriculture.[15] The name types ON *bólstaðr* and *staðir* (m.) are usually considered to be settlement name types, although the base meaning of the word ON *staðr* (m.), in a topographical sense, literally just means 'place' or 'place for permanent occupation'.[16] Again, it is a rather diffuse way of describing the type of settlement and its means of sustenance.

14. Cf. 'heimr m.', https://oda.uib.no/ordbok/?men=norrone s.v. heimr. Accessed 15 May 2022.
15. Cf. 'land n.[4]', https://oda.uib.no/ordbok/?men=norrone s.v. land. Accessed 15 May 2022.
16. Cf. 'staðr m.', https://oda.uib.no/ordbok/?men=norrone s.v. staðr. Accessed 15 May 2022.

The remaining elements ON *þveit* (f.), *setr/sætr* (n.), and *ruð* (n.) represent chronologically later settlement types than the above-mentioned ones. Of these, only ON *setr/sætr* (n.) has any settlement connotation, again with a rather vague core meaning of 'seat, place to stay', which developed into the known meaning of 'shieling, mountain pastures'.[17] The meaning of the elements ON *þveit* (f.) and *ruð* (n.) imply some sort of sectioning-off or development from a main settlement, as the core meaning of the word ON *þveit* (f.) is 'cut off'[18] and ON *ruð* (n.) carries the meaning of 'cleared place in a forest'.[19] All three elements would probably have been present in the Viking Age but mainly in the latter part, and ON *ruð* (n.), in particular, is associated more with medieval settlement development.

The application of the name elements at the time of name-formation may thus not necessarily have been the same as the historically known farm unit. They may reflect earlier and different settlement structures,[20] if these were settlements at all at the time of naming. However, from the earliest sources, it seems that both the application of meaning and type of locality were firmly placed in the settlement category. It should, therefore, be possible to say something about the type of settlement by examining the size of the settlement and its arable. For instance, if a place-name type is large in overall farm unit size but comparatively small in its size of arable, it may suggest a greater focus on extensive farming and non-agrarian sources of income. On the other hand, a relatively large proportion of a farm unit's overall size dedicated to farmland indicates

17. Cf. 'setr n.', https://oda.uib.no/ordbok/?men=norrone s.v. setr; 'sætr n.', https://oda.uib.no/ s.v. sætr. Both accessed 15 May 2022.
18. Cf. 'þveit f.', https://oda.uib.no/ordbok/?men=norrone s.v þveit. Accessed 15 May 2022.
19. Cf. 'ruð n.', https://oda.uib.no/ordbok/?men=norrone s.v. ruð. Accessed 15 May 2022.
20. Cf. Pilø 2005: 261–265; Gjerpe 2014: 68–69.

that the place-name type is oriented towards the cultivation of land.

With a baseline of 173 hectares in average size and a Gaussian distribution range of 26 to 517 ha, we can compare this to sizes of name types. It is generally assumed – and clearly suggested by studies from Denmark[21] – that the older the settlements are, the larger they are – especially in terms of value based on production capacity.[22] From the Norwegian material, however, the picture looks a bit more blurred. At the same time, it must be said that Norway has large regional differences in agricultural potential and capacity from region to region. Such differences may well lie behind any inconclusive results. For instance, the early name type *vin* (f.) is generally smaller than the national average, at 160 ha. The Gaussian distribution range does show that the name type's lower typical size is larger than the average range, although the typical larger size falls some 20% shy of the national average. ON *heimr* (m.) and *land* (n.), on the other hand, exceed the national average at 180 ha and 252 ha, respectively. In particular, *land* (n.) has a higher than baseline Gaussian distribution range.

Of the chronologically young place-name types, ON *setr/sætr* (n.) and ON *þveit* (f.) are surprisingly close to the national Gaussian distribution range, albeit slightly above average – typologically representing relatively solid settlements. ON *ruð* (n.) is, unsurprisingly, well below both the national average as well as the Gaussian distribution range. ON *ruð* (n.) is especially applied to small and later farm units. Working from the assumption that 'older equals larger', this is the expected distribution for this name type. It is a surprise, however, that the name types ON *setr/sætr* (n.) and ON *þveit* (f.) exceed the sizes

21. Jakobsen 2004: 74–80.
22. Cf. Dam 2015.

and Gaussian distribution range of the older place-name types. So 'older equals larger' does not seem to work for Norway, not when using overall size of the farm unit as the sole parameter.

The two central place-name types of this study, ON *bólstaðr* and *staðir* (m.), display some rather interesting and surprising characteristics. Sizewise, ON *staðir* (m.), as a place-name type, is almost identical in Gaussian distribution to the older name type ON *heimr (*m.), although the average of *staðir*-farms is a little lower. This name type can generally be seen to be relatively akin to the national average. The average of farm units in ON *bólstaðr* (m.) is, however, double that of the national average. But with a Gaussian distribution range of 88–798, this settlement name type is far greater than the average. Why ON *bólstaðr* (m.) displays such a deviation from the norm is not clear from the farm size alone, but it is suggestive of a farming economy differing from the norm or of a difference in farming management.

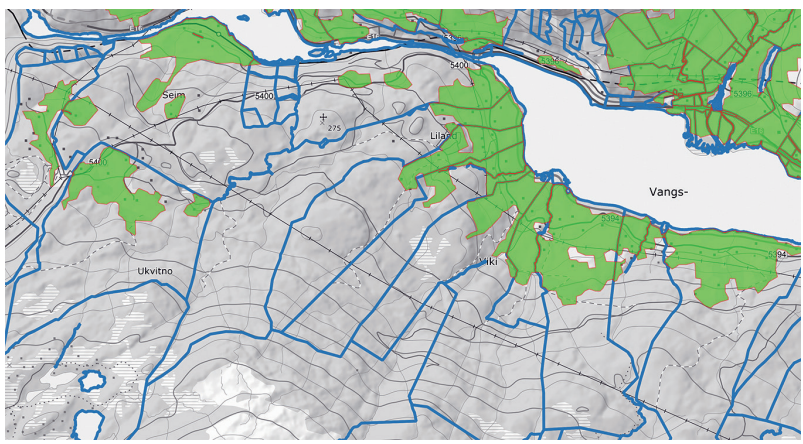


Figure 4: Map of section of Voss *kommune* in Vestland. The blue lines represent cadastral farm unit (*gard*) borders, and the green areas are farmland areas (NIBIO AR50 types settlement and farmland combined). Each farmland area is divided into units falling within cadastral farm unit areas. Basemap: Topografisk norgeskart gråtone, *Statens kartverk* (CC-BY). Overlays: Peder Gammeltoft.

Calculating the amount of arable per farm unit

Sheer size is not everything, though, and a better parameter to measure cadastral farm units may well be to look at the amount of arable in each of the 47,000 Norwegian *gard* units. There is no such data readily available for Norway, and no attempt at conducting research into this at a national level has ever been attempted. However, with the availability of area resource GIS themes from the Norwegian Institute of Bioeconomy Research (NIBIO), it has been possible to create a bespoke dataset for the purpose of researching amounts of arable per cadastral farm unit. This process is not easy, however, as it entails dividing the resource map into areas matching that of the cadastral farm units, which includes several stages of dataset modification before it is usable for such a purpose. The dataset used for this was the NIBIO AR50 dataset,[23] which is a generalised area resource map for Norway at the scale of 1:50,000. There are eight main resource classification themes, from which *Agriculture* (code 20) was chosen. It encompasses fully cultivated land, surface cultivated land, and infield pasture.

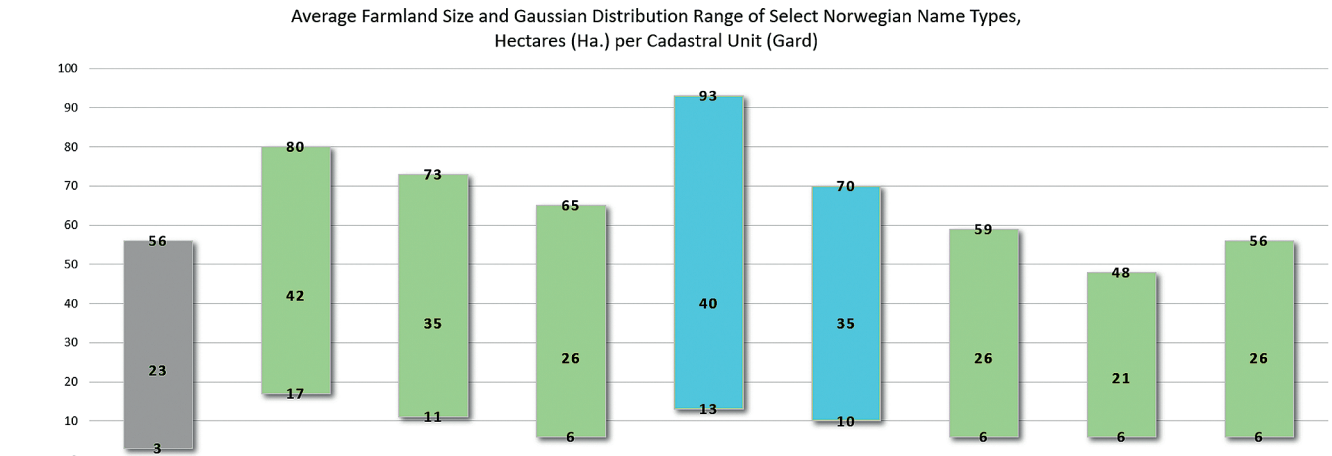
One of the major changes to the Norwegian landscape is settlement encroachment on agricultural land, so to be able to produce a more historically correct farmland theme per cadastral unit, the theme *Built-up areas* (code 10) – comprising residential areas, towns, cities, transport, industrial areas, etc. – was also included. There is a danger that this theme will inflate the numbers, as not just arable land is given over to settlement and industry. Every retrogressive geographical study operates with the problem of aligning historical phenomena

23. 'Dokumentasjon av AR50', *NIBIO*, https://www.nibio.no/tjenester/nedlasting-av-kartdata. Accessed 15 May 2022.

with later statistical information, and figures are never going to fully match former conditions – they can only act as a guiding figure for statistical purposes. The current agricultural state of Norway is definitely not the same as in earlier time periods, but since Norway's topography leaves the country with no more than 3% agricultural land available, these figures cannot be significantly different now from then – there simply is nowhere to expand into.

For any type of standard Norwegian farm, the arable has traditionally been the main source of income, with outfield pasture an important addition to the economy. Thus, arable resource information will be relevant to the evaluation of the significance of place-name types. As Figure 5 shows, the average arable of an average *gard* cadastral unit for Norway is a mere 23 ha, with a Gaussian distribution range of 3 to 56 ha. If the overall farm-unit size did not show the expected 'older equals bigger' distribution known from Denmark, the arable gives a somewhat clearer overall picture of larger sizes for older name types and lower for younger.

For instance, place-names of the *vin*-type are almost double in average size as compared with the chronologically later ON *setr/sætr* (n.), *þveit* (f.), and *ruð* (n.) place-name types. Generally, the pre-Viking and Viking Age types have larger averages and Gaussian distributions, and only the later name types are close or lower than the average-size farm unit. This generally speaks to the agricultural focus of these place-name types, and that these constituted important and high-status name types in their time. ON *vin* (f.) is the one with the highest average of 42 ha and a Gaussian distribution range of 17–80 ha. The name type ON *heimr* (m.) is not far behind, with an average of 35 ha and a Gaussian distribution range of 11–73 ha.



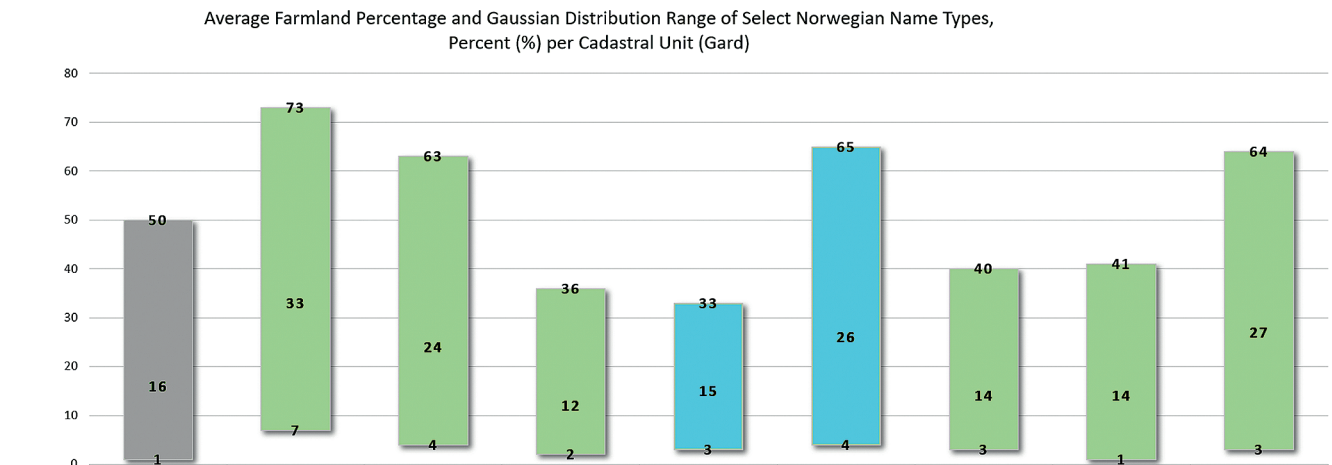
	AV. SIZE	VIN	HEIMR	LAND	BÓLSTAÐR	STAÐIR	SETR/SÆTR	ÞVEIT	RUÐ
Min.	3	17	11	6	13	10	6	6	6
Average	23	42	35	26	40	35	26	21	26
Max.	56	80	73	65	93	70	59	48	56

Figure 5: Diagram of select Norwegian place-name types showing average and Gaussian distribution range of farmland sizes of top-level *gard* cadastral farm units. The grey column represents the national average and distribution range. The blue columns constitute the place-name types ON *bólstaðr* and *staðir* (m.) focused on in this study. The green columns are name types chosen for comparison. Diagram: Peder Gammeltoft.

It is surprising that ON *bólstaðr* and *staðir* (m.) almost match the averages of their pre-Viking counterparts at 40 and 35 ha, respectively. ON *bólstaðr* (m.) has a Gaussian distribution range of almost double that of the farm-unit average, and at 13–93 ha, it clearly supersedes ON *vin* (f.) in the top of the distribution range. The Gaussian distribution range of ON *staðir* (m.), on the other hand, is like that of the pre-Viking name types. ON *land* (n.), which sported the largest overall size average and one of the highest Gaussian distribution ranges, is exhibiting relatively low figures when it comes to available agricultural land. The average of 25 ha and Gaussian distribution of 7–65 ha for ON *land* (n.) aligns it closer to the agricultural potentials displayed in later name types than to its contemporaries. This seems to signal a focus on extensive farming in addition to cultivation.

Again, ON *bólstaðr* and *staðir* (m.) demonstrate that they are important settlement types that must have been high-status at the time of their establishment. It is, however, surprising that they match or exceed their pre-Viking counterparts. How this is the case is uncertain, and cannot be solved without further study. However, with two different geographical parameters to judge settlement types on, it is possible to look at the percentage of agricultural land compared to overall size. If the percentage is high, then the agricultural focus is clearly on cultivation, whereas a low percentage will signal a greater reliance on extensive farming, pastoral activities, and hunting.

Figure 6 shows that the average farm unit agricultural resource percentage is 16% and the Gaussian distribution range runs from 1% to 50% (grey column), meaning that the typical average cadastral farm unit in Norway only has about one sixth agricultural land, the remainder being too hilly, mountainous, wet, or with too shallow a soil cover to be viable for cultivation. The normal percentage range is quite large, but a cadastral farm unit does typically not have half of its total area under cultivation.



	AV. PCT	VIN	HEIMR	LAND	BÓLSTAÐR	STAÐIR	SETR/SÆTR	ÞVEIT	RUÐ
Min.	1	7	4	2	3	4	3	1	3
Average	16	33	24	12	15	26	14	14	27
Max.	50	73	63	36	33	65	40	41	64

Figure 6: Diagram of select Norwegian place-name types, showing average and Gaussian distribution range of the percentage of farmland as compared to overall size of top-level *gard* cadastral farm units. The grey column represents the national average and distribution range. The blue columns constitute the place-name types ON *bólstaðr* and *staðir* (m.) focused on in this study. The green columns are name types chosen for comparison. Diagram: Peder Gammeltoft.

In comparison, the pre-Viking Age ON *vin* (f.) and *heimr* (m.) by far exceed both the average and the Gaussian distribution range percentages. On average, a *vin*-settlement has a third of its total land under cultivation, and although the size range varies a lot, it may be as high as 73% within the normal distribution. ON *heimr* (m.) does not have figures quite as prominent as those of ON *vin* (f.), but around a quarter of the total size taken up by the arable is average, even though the arable can take up anything from 4% to 63%. Of the Viking Age name types, ON *staðir* (m.) features almost identical figures to ON *heimr* (m.), albeit with a percent or two higher in average and in normal distribution. By comparison, ON *land* (n.) and ON *bólstaðr* (m.) have rather poor farmland averages, below that of the national average for cadastral farm units, at 12% and 15% respectively. And within the Gaussian distribution range, they never exceed more than 36% and 33% of the total. For the name type ON *land* (n.), this is not very surprising, given their generally large overall size and low farmland figures. Yet for ON *bólstaðr* (m.), this is rather unexpected, as not only does it have a high overall size average, but it also has high farmland features. This suggests that this name type relies on a dual intensive-extensive farming economy, possibly even to the extent that these sites were originally laid out according to a certain farmland to size ratio.

The chronologically later place-name types ON *setr*/*sætr* (n.) and ON *þveit* (f.) share almost identical average and Gaussian distribution range percentages, being generally below the national cadastral farm unit average, as would be expected by later settlement types. ON *ruð* (n.), on the other hand, is almost on par with ON *staðir* (m.). This, however, is owed to the generally low overall size of the name type and comparatively large farmland size average.

What can we use this knowledge for?

Previous research into Norwegian place-name types have focussed on etymology and to some extent on post-medieval taxation (*landskyld*). There were no other means of subjecting place-name types to comparative studies. With the introduction of geographical information systems (GIS) to the humanities, spatial analyses of place-name types have gained popularity.[24] They are, however, still difficult to undertake due to a lack of availability of basic spatial GIS themes that can be used and adapted for this kind of research. This chapter has demonstrated how adaptation of datasets can yield new information which can be used in future analyses.

Although ON *bólstaðr* and *staðir* (m.) share the same word – ON *staðr* (m. 'place' or 'place for permanent occupation') – they perform quite differently when compared spatially. Both place-name types are above the average farm size, but ON *bólstaðr* (m.) has the highest overall size Gaussian distribution range (88–798 ha; average sized farm: 26–517 ha), showing that this name type can occupy very large tracts of land as cadastral farm units. However, the average *bólstaðr*-farm size (345 ha) is double that of the national average (173 ha). The amount of arable farmland (13–93 ha; average 40 ha) is almost double the national cadastral farm unit average (3–56 ha; average 23 ha), signalling that cultivation must have figured as a central element.

More surprisingly, however, the percentage of farmland in relation to overall size is only average and of a very limited Gaussian distribution range of 3–33% of a farm's entire size. This means that *bólstaðr*-farms have a stable ratio between

24. Cf. e.g. Foster 2020: 371–385.

farmland and overall size. Regardless of the size of the arable, the overall size is proportionally similar: on average four to five times larger than that of the arable. So although there was a cultivation focus, extensive sustenance activities must also have played a significant role. This name-type trait may relate to the first element of the name type compound, ON *ból* (n.). This word has several meanings, one being 'land of a certain size, yielding a certain amount in rent'.[25] It is not inconceivable that as a farm rent unit, the value was assessed based on a farming potential where extensive farming sustenance figures on par with intensive farming.

ON *staðir* (m.), on the other hand, has a more restricted overall Gaussian distribution range (47–486 ha) than the average cadastral farm unit (26–517 ha). It is roughly similar in size to the contemporary name types ON *setr/sætr* (n.) and *þveit* (f.), and seems to reflect the 'standard' Viking Age size needed for a farm unit. However, the average arable farmland size (35 ha vs 25 and 21 ha, respectively) and generous Gaussian distribution range of ON *staðir* (10–70 ha) is considerably higher than for ON *setr/sætr* (6–59 ha) and *þveit* (6–48 ha), and is also well above that of the average (3–56 ha; average 23 ha). It is thus not surprising that the name type has a higher than normal farmland-to-overall-size ratio. In fact, it is comparable to that of older settlement types like ON *heimr* (m.) and, to some extent, ON *vin* (f.) The high percentage of arable of the total size (4–65%; average 26%) as compared to the average sized farm (1–50%; average 16%) strongly indicates that the farming focus must generally have been on cultivation and to a lesser extent on extensive farming.

25. 'ból n.', https://oda.uib.no/ordbok/?men=norrone s.v. ból. Accessed 15 May 2022.

Conclusion

This study has shown that both place-name types were used for high-status settlements, which may help us understand the popularity of the name types in the Viking Age colonies in Britain and Ireland. Whether their original meanings were carried over and applied to similar types of farms in the Scottish Viking Age colonies is unknown. Lindsey Macgregor's studies of the taxation and value of the place-name types in Shetland demonstrated that ON *staðir* (m.) was definitely applied to high-status secondary farms on very productive land.[26] However, for *bólstaðr*-farms, she concluded that they were generally of a much more restricted nature and established as secondary farms on cultivated fields. Their valuation was also generally lower than for *staðir*-farms.[27] This seems somewhat at odds with what this study finds for Norway, but outfield extensive farming may perhaps not have been factored in in the same way within the later Shetland taxation valuations. Either that, or the settlements may have experienced subsequent splitting up, thus blurring the later picture.

Concerns can be raised over applying modern material retrogressively to historical names. This is, indeed, a valid concern. A retrogressive analysis can only be indicative of past conditions. However, where the Norwegian natural and topographical conditions determine agricultural activity and sustenance, current conditions will not be significantly different to past ones. Without this type of analysis, we will still be forced to describe place-name types in the broadest possible terms without any quantifiable evidence. In a spatial analysis, the measurements

26. Macgregor 1986: 92–93.
27. Ibid.: 96.

are precise and quantifiable. And with a constant set of measurable parameters, quantitative statistics are enabled across any place-name type at any number and distribution.

Creating the datasets behind this analysis has not been straightforward, but is now proven to be possible. It is my hope that this will be the first of several forays into quantitative analyses of place-names, to attain a better understanding of our onomastic past. Arne Kruse, to whom this edited volume is dedicated, has worked tirelessly on improving our knowledge of place-names and putting them into context. This chapter has been written with the above aim, and it is therefore appropriate to dedicate it to Arne and his work!

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