



# Epistemic Landscape Atlas of Brunei Darussalam

Hans-Dieter Evers, Anthony Banyouko Ndah, Liyana Yahya

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## **Authors**

Prof. Dr. Hans-Dieter Evers, Eminent Visiting Professor, Institute of Asian Studies, Universiti of Brunei Darussalam. Contact: [hdevers@uni-bonn.de](mailto:hdevers@uni-bonn.de) . Internet: <https://sites.google.com/site/hansdieterevers/home>

Anthony Banyouko Ndah, M.A., Research Fellow, Environmental Studies Programme, Faculty of Arts and Social Science, Universiti Brunei Darussalam. Contact: [tonyban83@gmail.com](mailto:tonyban83@gmail.com)

Liyana Yahya, Research Assistant, Faculty of Business, Economics and Policy Studies, Faculty of Arts and Social Science, Universiti Brunei Darussalam.

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# Epistemic Landscape Atlas of Brunei Darussalam

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Hans-Dieter Evers, Anthony Banyouko Ndah & Liyana Yahya

This atlas presents the geo-visual outcome of the project titled “Knowledge hubs in Brunei Darussalam”<sup>1</sup>.

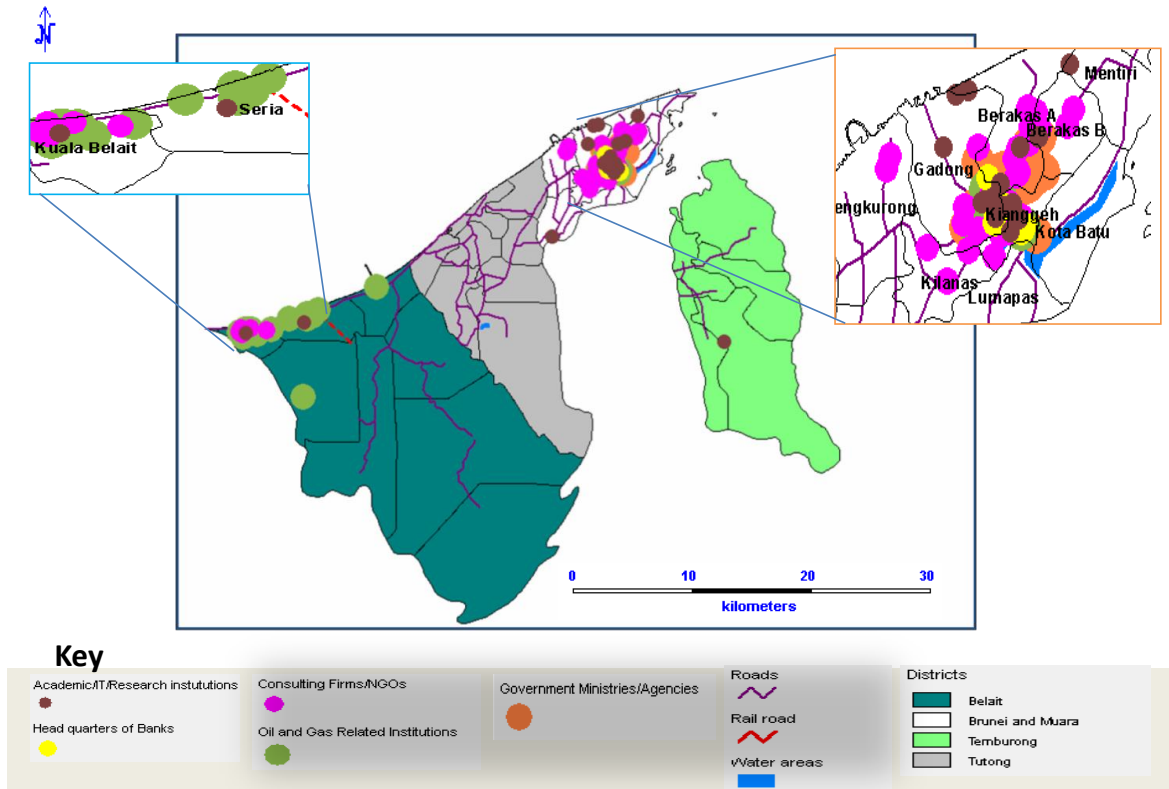
The availability and application of knowledge has been identified as the most important driving force of innovation and the social and economic development of a knowledge-based economy. As an additional factor the spatial distribution of high-level manpower, of knowledge producing institutions and of high-tech driven industrial production, in short the development of knowledge clusters is seen as an essential precondition for sustainable economic growth.

The initial attempt to map knowledge clusters was done with the aid of the free software ‘DIVA GIS’. Later on, with access to ArcGIS soft ware, the map quality and visual effects was improved upon. All the maps produced so far have therefore been included in this first atlas which is intended to serve as a reference document not only for similar studies and research but for development planning in Brunei Darussalam. This atlas will therefore serve as a valuable tool for both researchers and government departments. In the general map-making process, three vector layers – roads, rail roads and water areas – are overlaid on the Brunei shapefile which contains administrative boundaries, downloaded from Diva GIS web site. Coordinates of knowledge institutions were imported to the Diva GIS soft ware from an Excel spread sheet appearing as point symbols on the maps, representing individual institutions. It should however be borne in mind that the mapping process is still continuous and improvements and corrections will further be done to remove current imperfections. This is therefore not the final output.

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<sup>1</sup> This project was carried out under a UBD research grant by a research team: Associate Professor Dr Roger Lawrey, (formerly FBEPS UBD) School of Accounting, Economics and Finance, University of Southern Queensland; Professor Dr Hans-Dieter Evers, Eminent Visiting Professor, Faculty of Arts and Social Sciences, UBD; Hjh Siti Rafidzah binti Hj Sulaiman, Lecturer, Faculty of Business, Economics and Policy Studies, UBD; Anthony Banyouko, PhD Research Fellow, Environmental Studies Program, FASS UBD; Liyana Yahya, Research Assistant, FBEPS UBD, Dr Farah Purwaningrum, Research Fellow, Institute of Asian Studies, UBD.

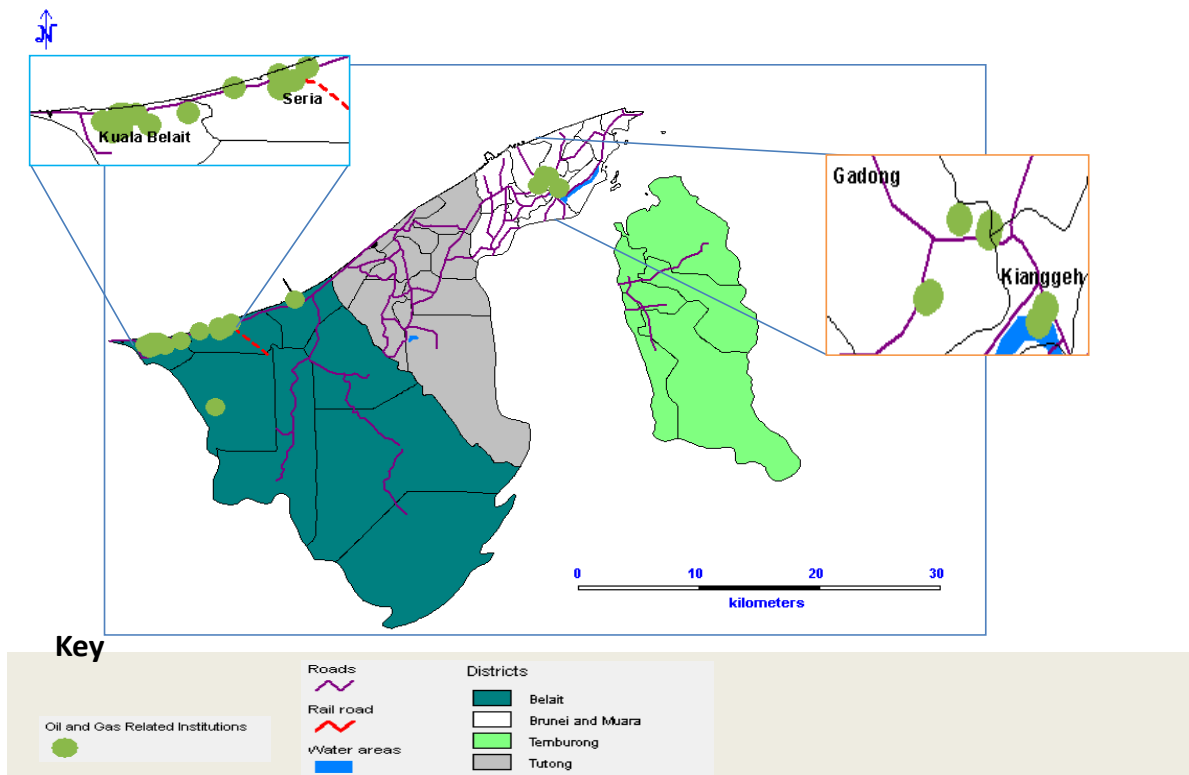
## Epistemic Landscape Map of Brunei Darussalam showing Knowledge Clusters



Map 1. Knowledge Clusters in Brunei Darussalam

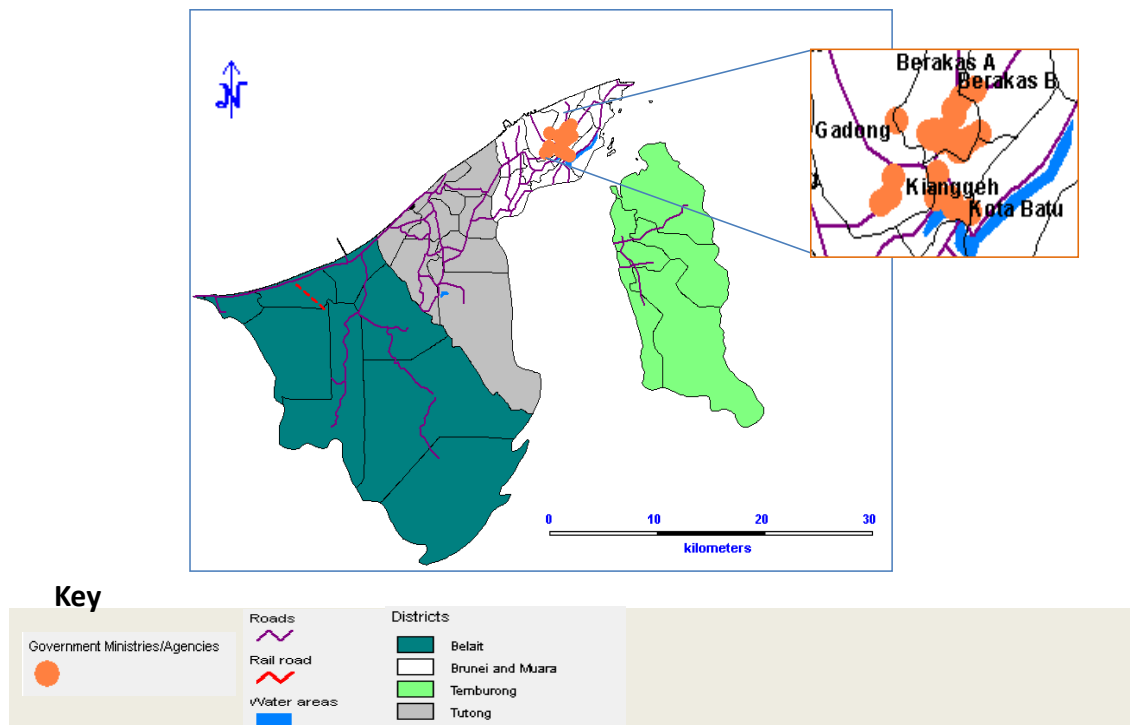
The initial map produced with the free software DIVA GIS. This map displays all institutions which have been considered here as knowledge producing/knowledge holding institutions in Brunei Darussalam, including: academic related institutions, government ministries and related agencies, oil/gas related institutions, head quarters of banking institutions and consulting firms/NGOs. This map clearly shows the general extreme clustering of K-institutions in Brunei-Muara district and Belait District, while the rest of the country is void of any form of K-cluster.

## Epistemic Landscape map of Brunei Darussalam: Clustering of Oil/Gas related Agencies



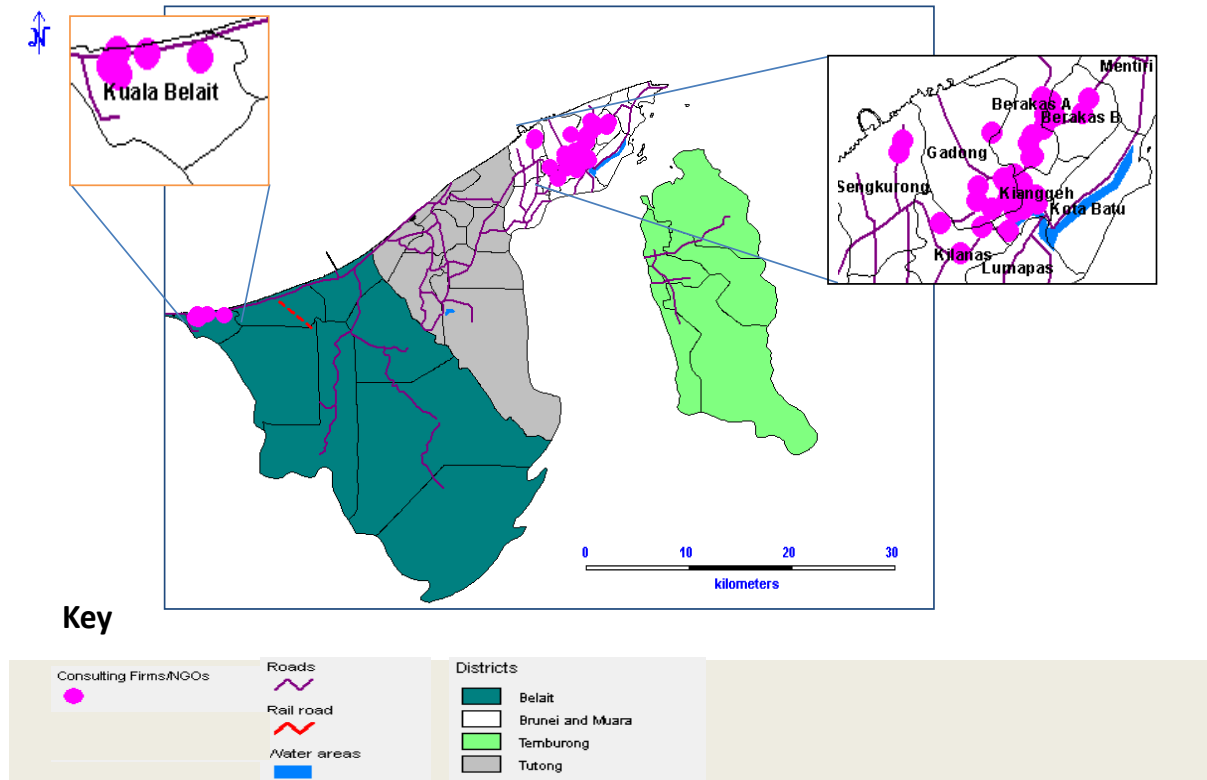
Map 2. This is a Diva GIS map showing institutions related to only the oil and gas sector in Brunei Darussalam. Note the clustering in Belait District in general, and in Kuala Belait and Seria towns in particular, where the oil fields are located. The small cluster seen in Brunei-Muara District represent the institutions involved with energy governance in the country.

### Epistemic Landscape map of Brunei Darussalam: Clustering of Government Ministries, Departments and Related Agencies



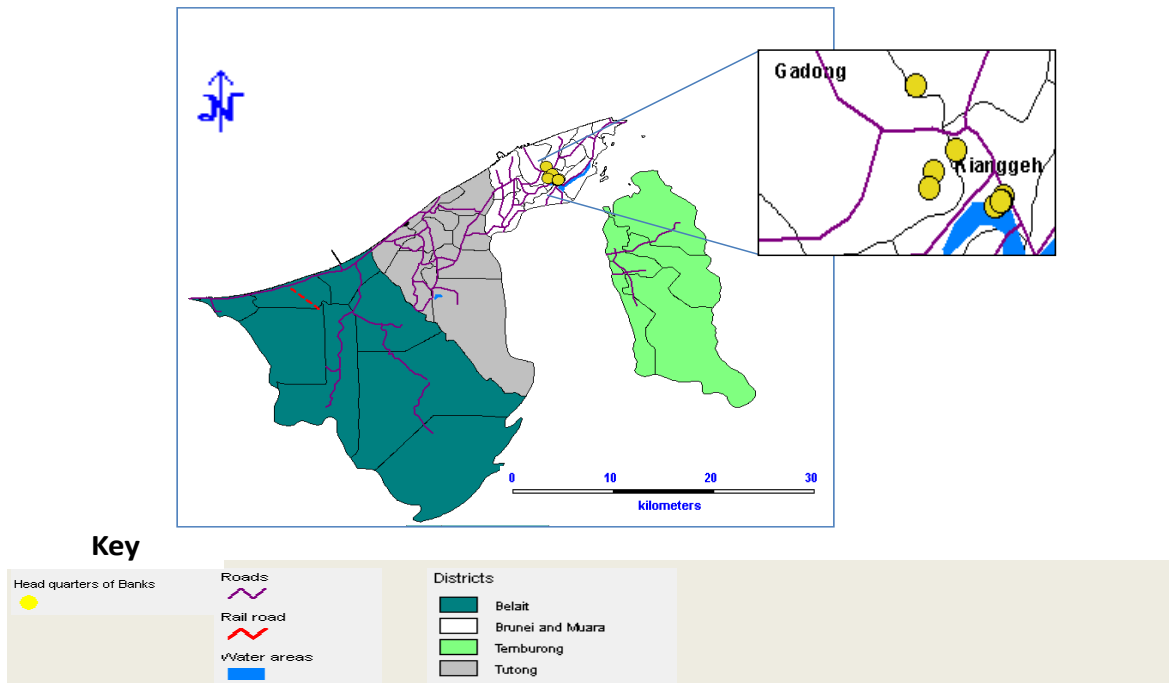
Map 3. This map shows the cluster of government ministries and related state agencies. This particular group of institutions is mainly located in Brunei-Muara district forming the dense cluster where as elsewhere, no government ministry exists. However, some departments have agency branches located in the other districts, but not agglomerated as to form clusters.

## Epistemic Landscape map of Brunei Darussalam: Clustering Consulting Firms/NGOs



Map 4. This map shows intense clustering of consulting firms and NGOs in Brunei Muara district and a small cluster of these institutions in Belait District.

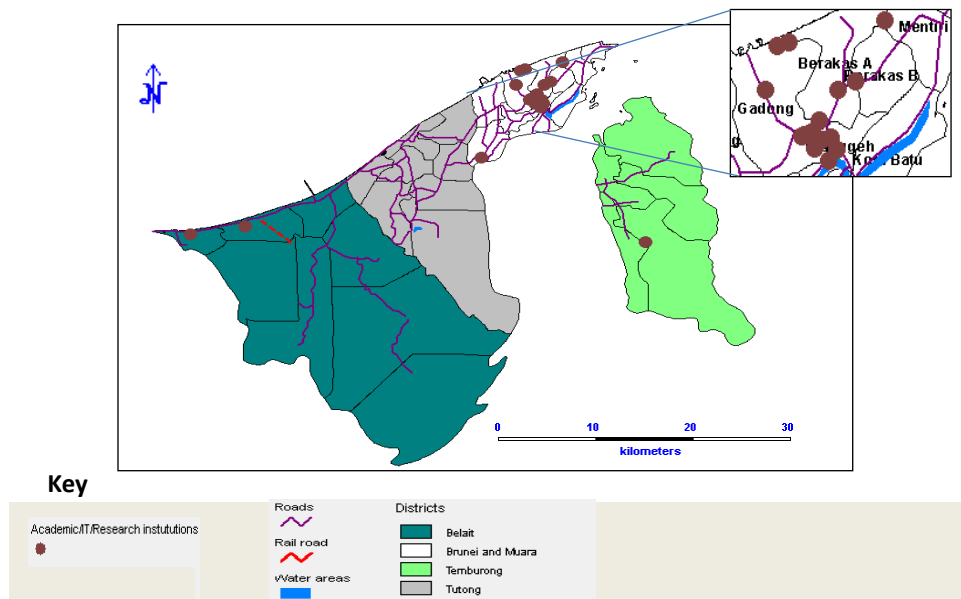
### Epistemic Landscape map of Brunei Darussalam: Clustering of Head Quarters of Banking Institutions



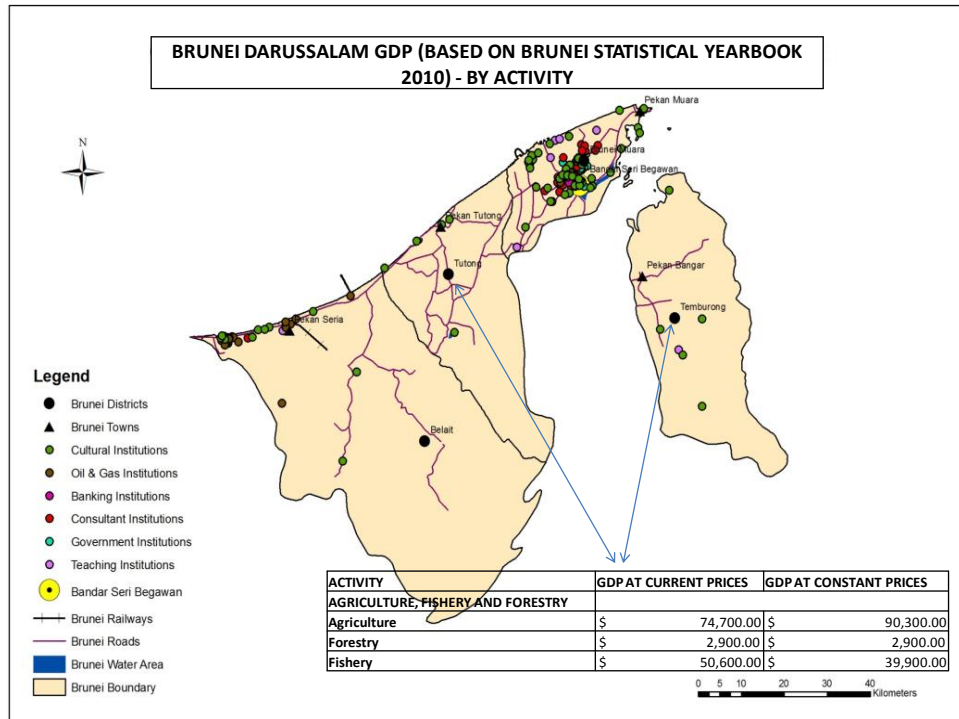
Map 6. Banking institutions have also been found to intensely cluster in Brunei Muara district. However, only the head quarters of banks were considered in this study. Banking has become a knowledge-intensive industry. Online banking requires intricate software, which has to be managed and up-graded continuously. Banking services, especially stock and derivatives trading require intensive analysis of markets world-wide. Knowledgeable people are needed to advise customers and knowledge and experience has to be applied to analyze market trends. Banks are therefore knowledge hubs, exchanging knowledge and information with other banks.



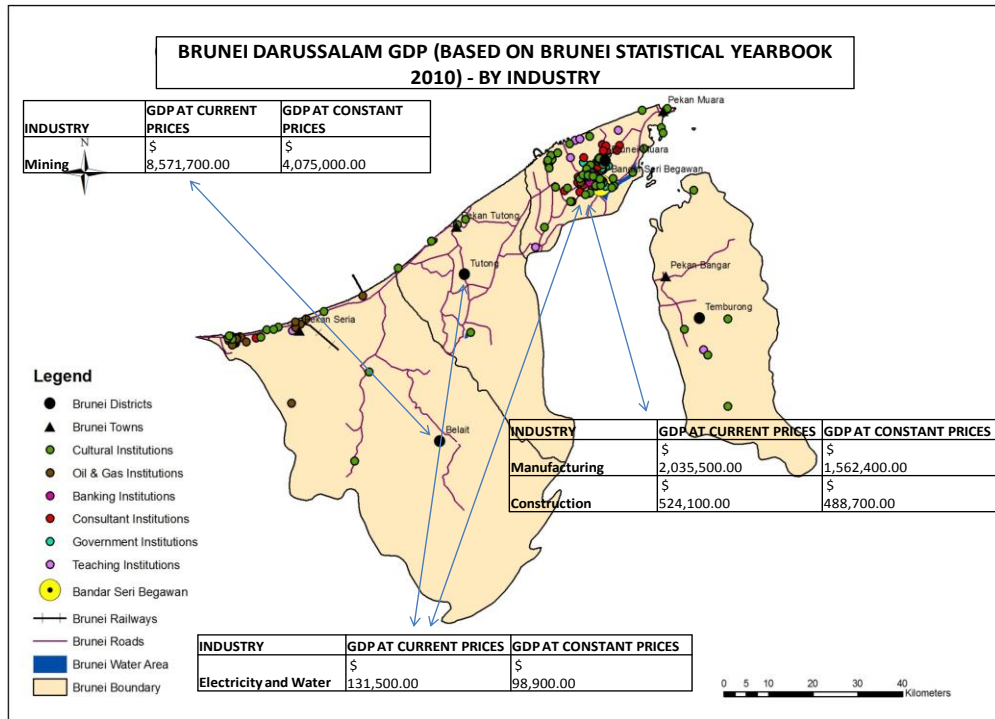
### Epistemic Landscape map of Brunei Darussalam: Clustering of Research-related institutions



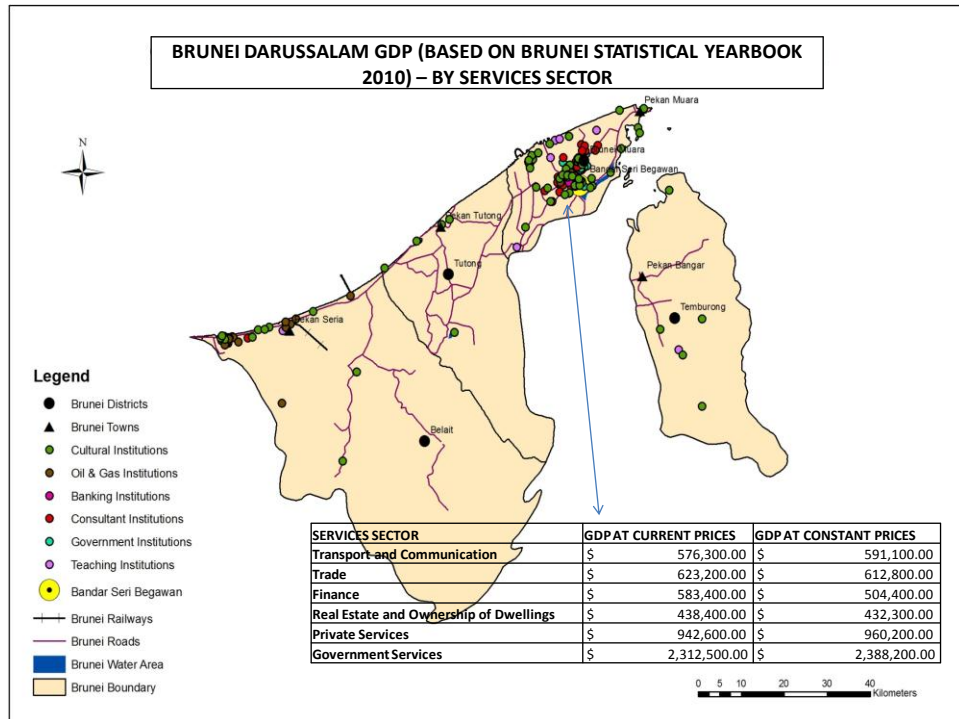
Map 7. An intense cluster of academic/research institutions in Brunei-Muara district similar to all other k-institutions, indicating the preference of this district for socio-economic institutions producing and holding knowledge. The reason for this unevenness of clustering in the country is to be uncovered. The most simple explanation would lie in the distribution of the population and the rate of urbanization. One can assume that knowledge clusters can only develop in densely populated areas. The issue is, however, more complicated, as our study shows.



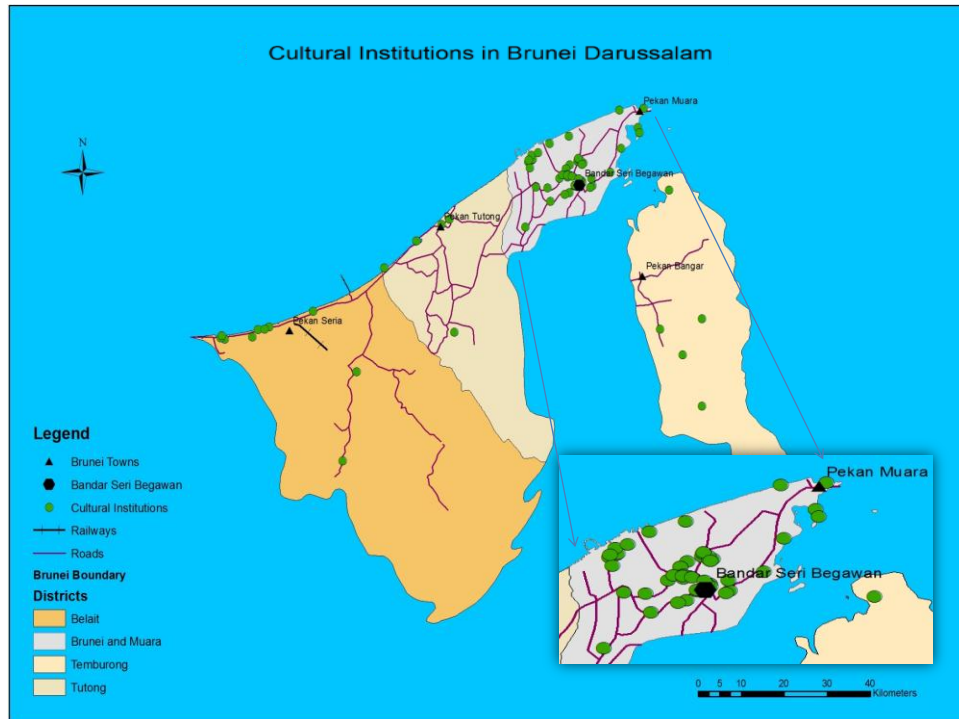
Map 8. Incorporating GDP figures in the k-cluster map of Brunei Darussalam reveals that high GDP tends to increase where K-clusters are found. However, does intense clustering in Brunei Darussalam result in high GDP? Map 8 shows that the GDP of Tutong and Temburong Districts, void of K-clusters is mainly contributed by the primary sector (agriculture, fisheries and forestry).



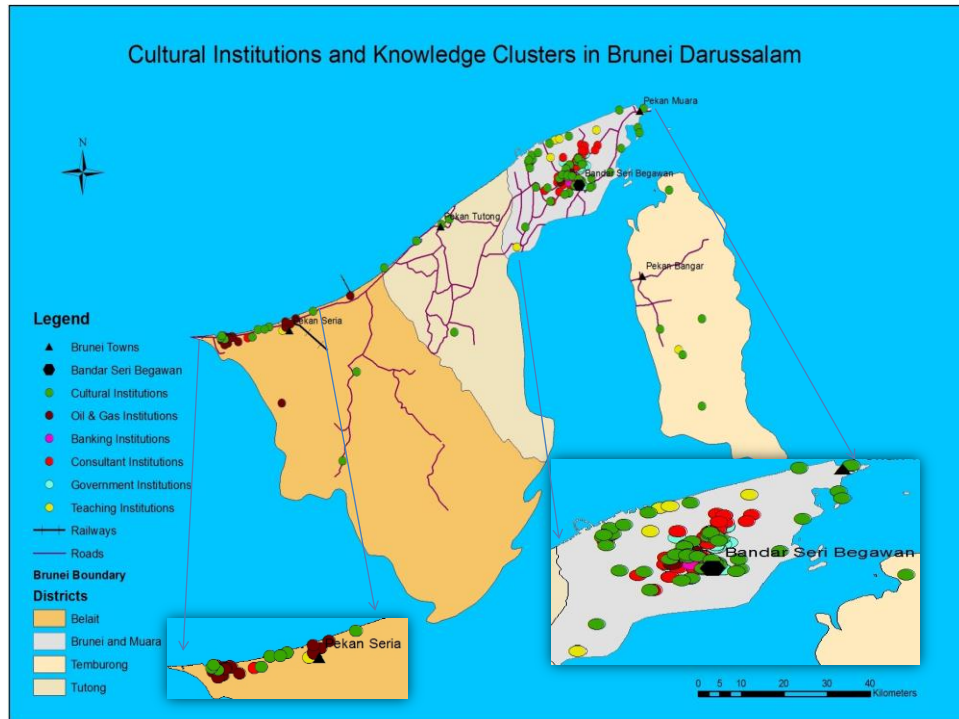
Map 9. The GDP of Belait district is largest, despite the relatively small cluster; while the GDP of Brunei-Muara is smaller despite the larger cluster size.



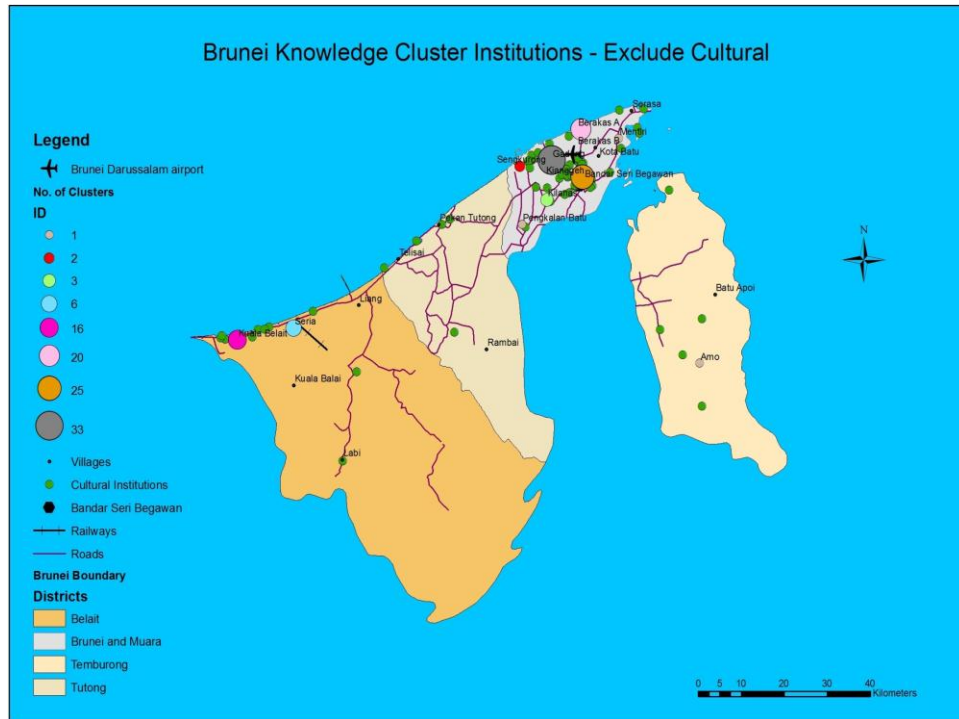
Map 10. The GDP of Brunei-Muara district is made up of all service sectors, showing a disproportionately large contribution of the government sector to total GDP in the district. This is clear indication of the role of the Government in K-cluster development.



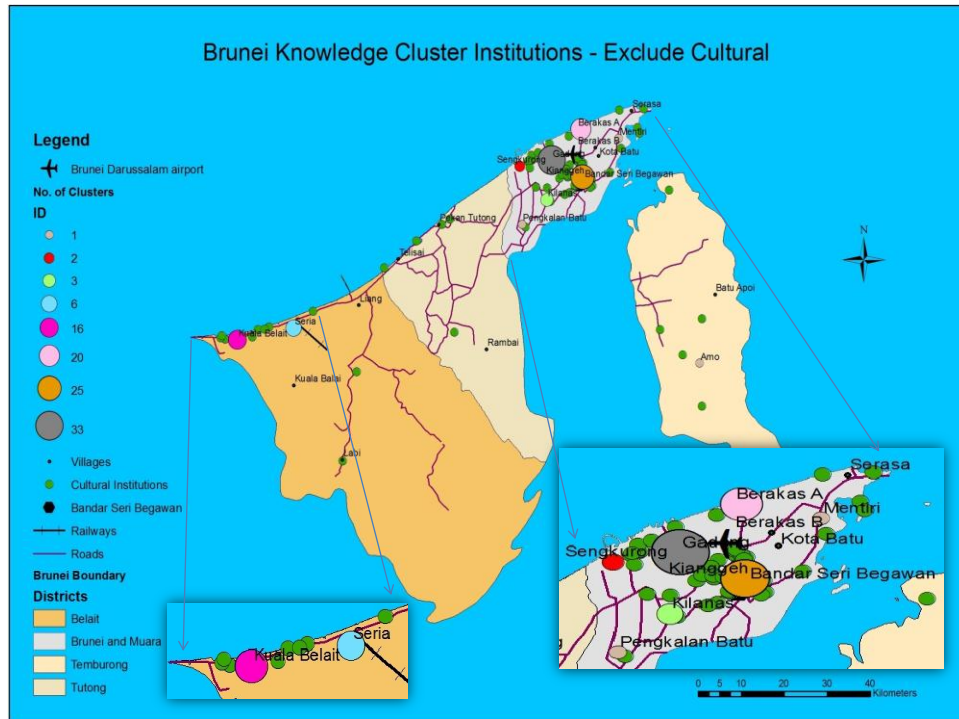
Map 11. This is a ArcGIS map of cultural institutions in Brunei Darussalam. In this study, a series of institutions referred here as cultural institutions which are believed have the potential to make an area livable and attractive to both local residents and expatriates in Brunei Darussalam include: hotels and gulf courses, museums, parks and nature reserves, shopping complexes etc. It is generally held that cultural institutions will attract knowledge workers to a specific location as well as motivate the length of their stay in that area. The mapping of cultural institution reveals an intense cluster of these institutions in Brunei-Muara district and a smaller cluster in Belait District, both dominated mainly by the retail/shopping centres and other tertiary activities such as hotels as well as recreational centres such as golf courses, clubs, etc. The cultural institutions in Tutong and Belait districts are mainly those related with ecotourism and environmental and tradition, including forest reserves and parks, folklore, etc.



Map 12. This ArcGIS map brings out relationship between cultural institutions and the development of K-clusters in Brunei Darussalam. There appears to be a strong correlation between cultural institutions and K-clusters. However, the question remains: which precedes the other; K-clusters or cultural institutions?



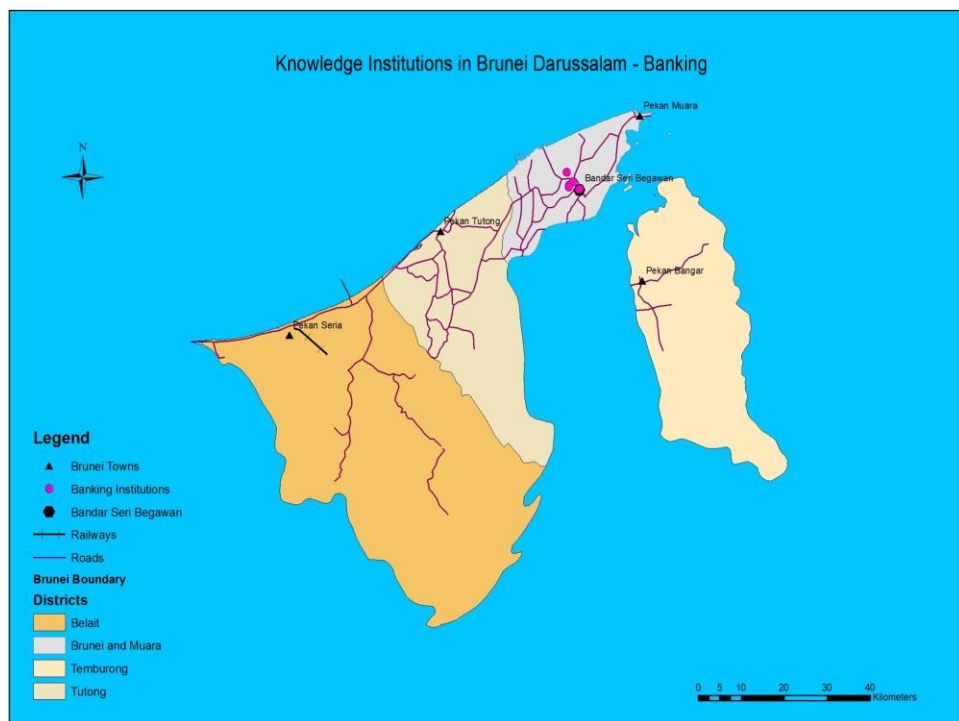
Map 13. K-cluster map of Brunei Darussalam based on the total number of individual institutions within the different broad categories of knowledge institutions – cultural, academic, oil/gas, consulting, NGOs etc.



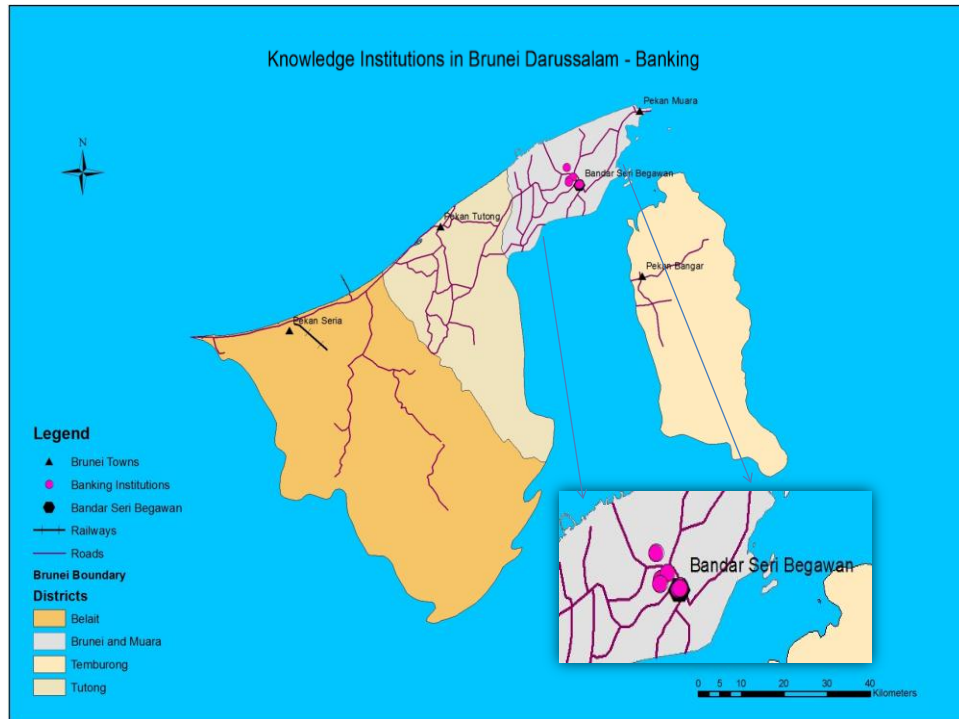
Map 14. This map reveals as has been shown so far, that intense clustering of knowledge and cultural institutions exists in Brunei-Muara district. It therefore reveals that intense agglomerations also do exist within the sub-clusters within the general K-cluster, in Brunei-Muara District.



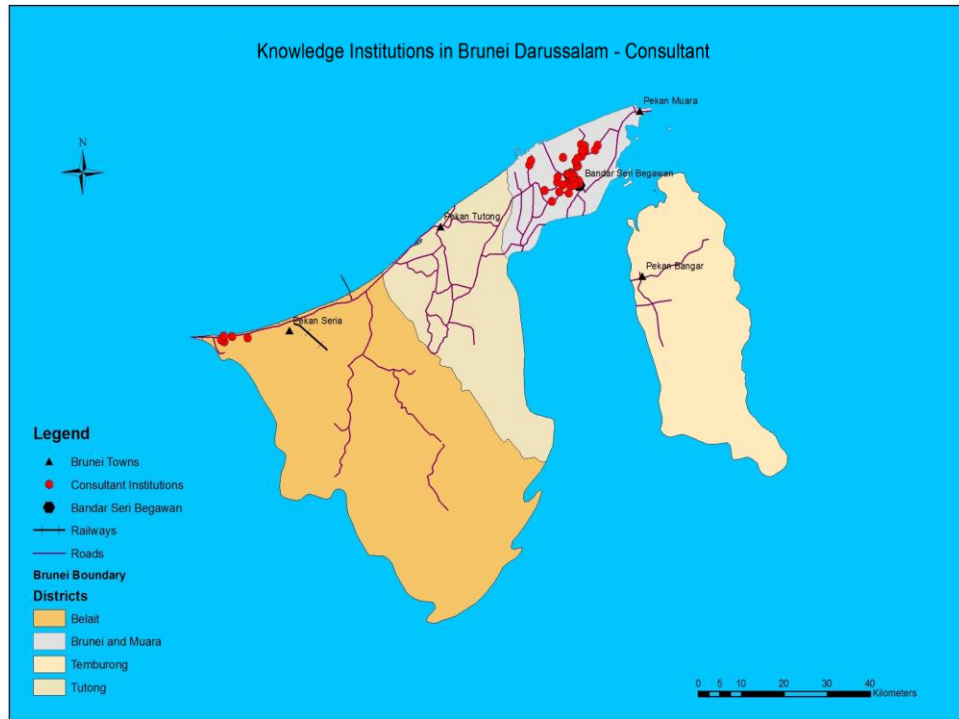
Maps 13 to 22 are ArcGIS maps showing the clustering of all individual K-institutions in Brunei-Muara district. These are produced to serve as an improvement of previous Diva GIS maps.



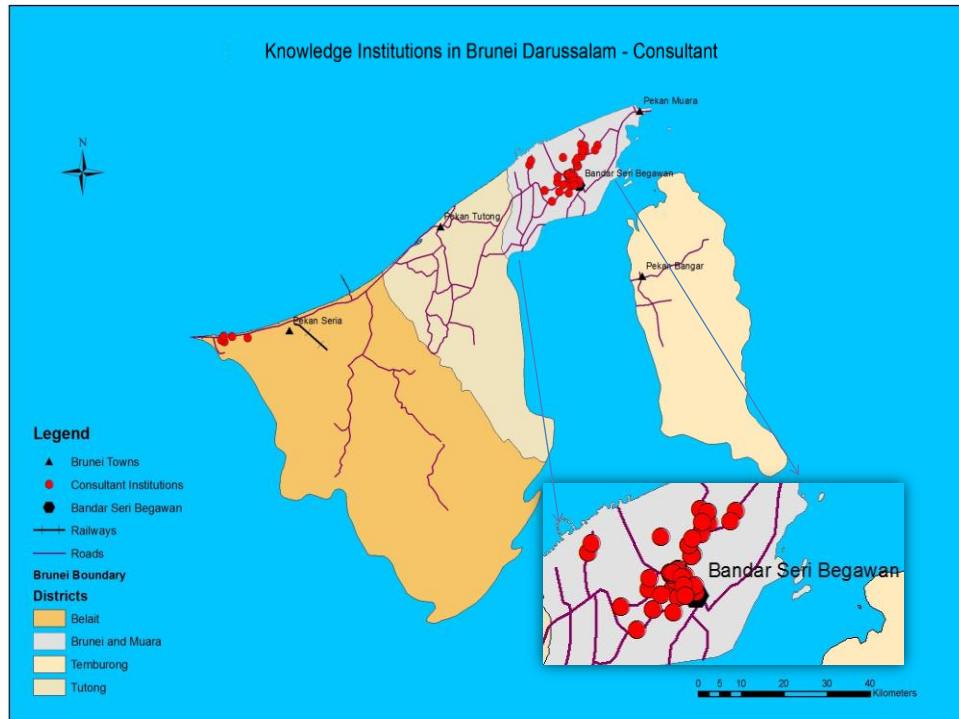
Map 13. Banks and Bank Branches in Brunei Darussalam



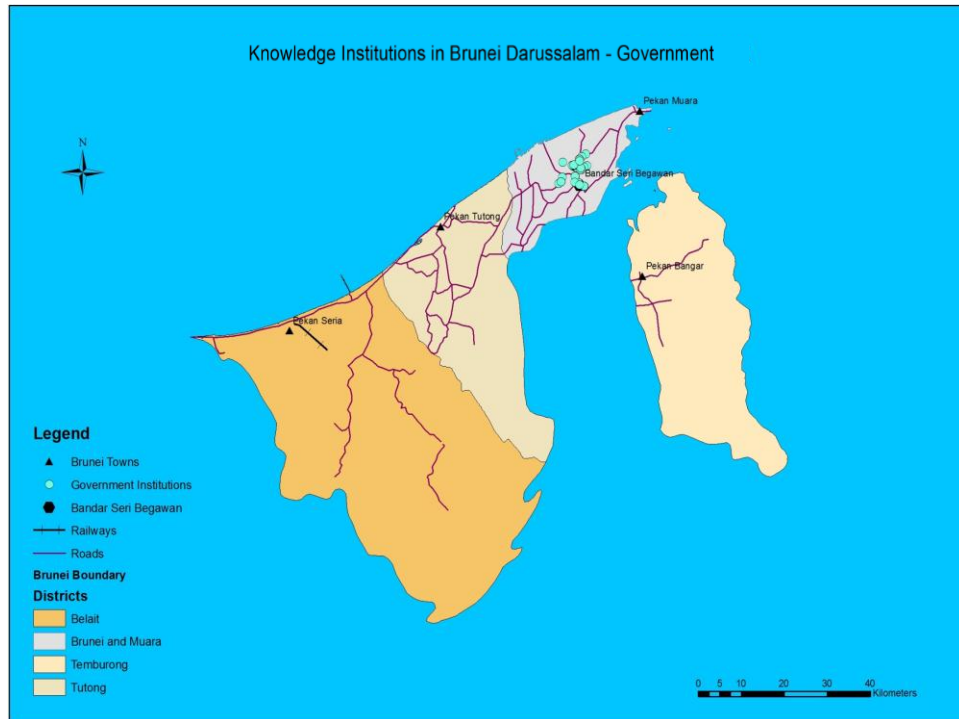
Map 14. Banks and Bank Branches in Brunei Darussalam (inset: Bandar Seri Begawan)



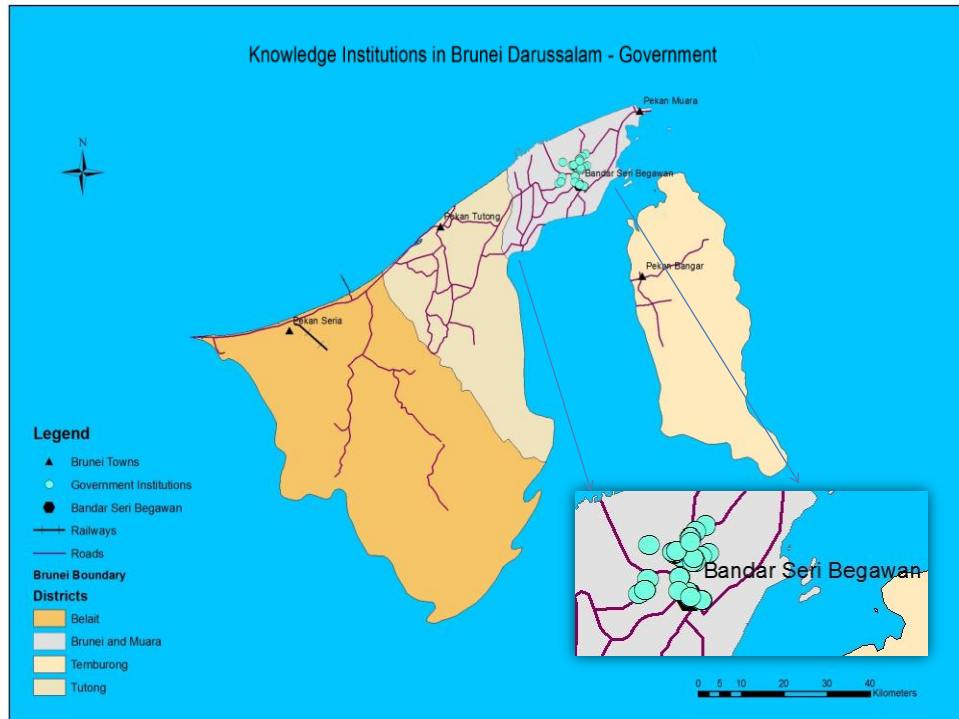
Map 15. Consultancy firms and agencies in Brunei Darussalam



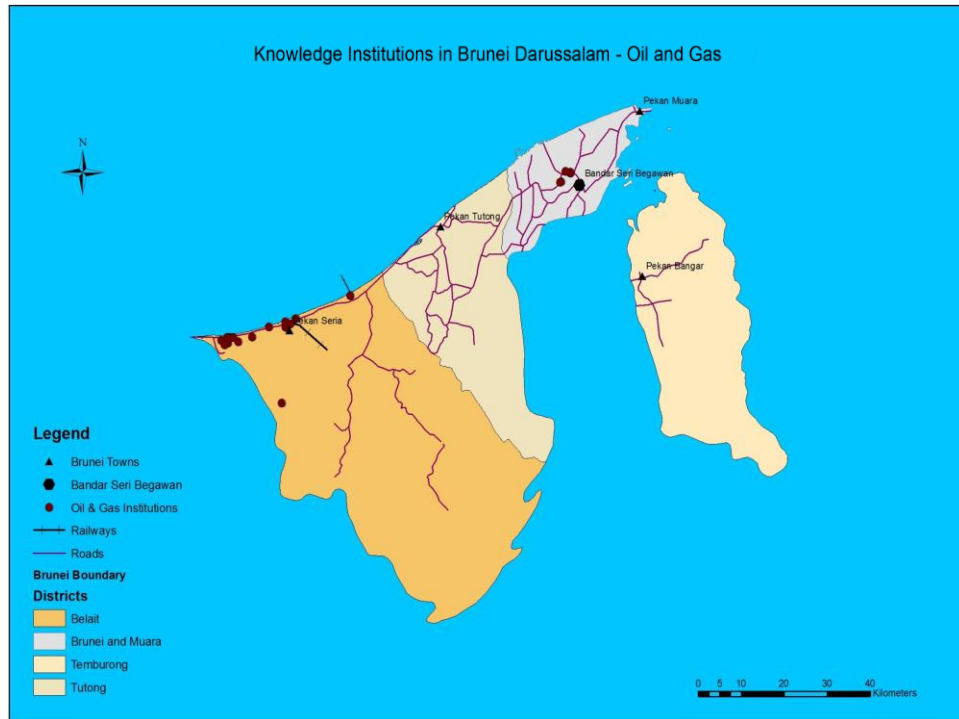
Map 16. Consultancy firms and agencies in Brunei Darussalam (inset: Bandar Seri Begawan)



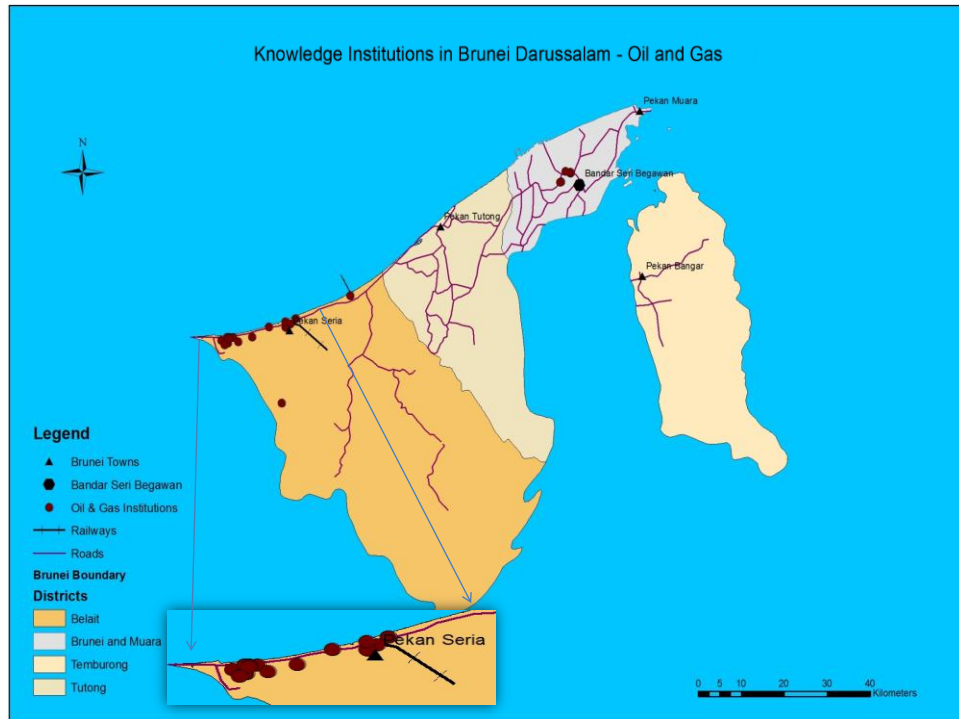
Map 17. Government offices and institutions in Brunei Darussalam



Map 18. Government offices and institutions in Brunei Darussalam

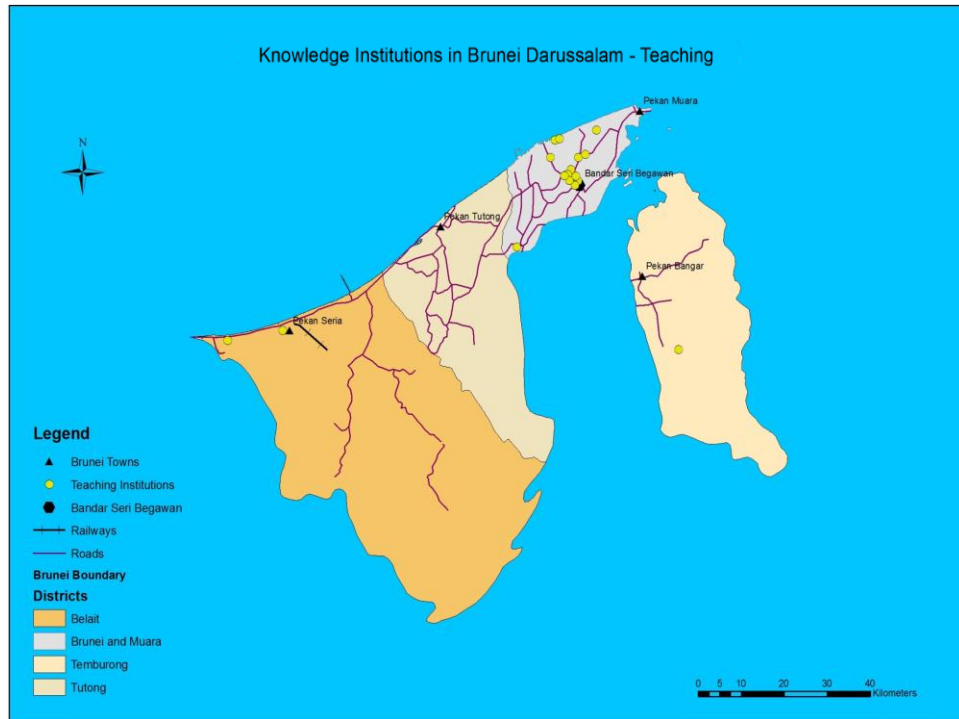


Map 19. Companies and institutes related to the oil and gas industry in Brunei Darussalam

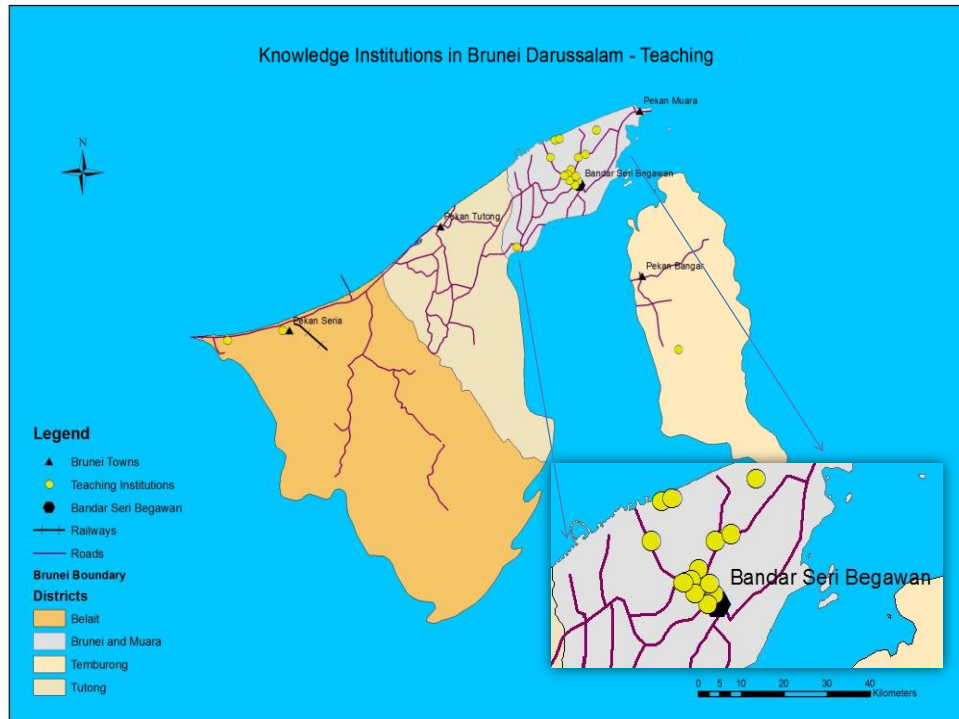


Map 20. Companies and institutes related to the oil and gas industry in Brunei Darussalam

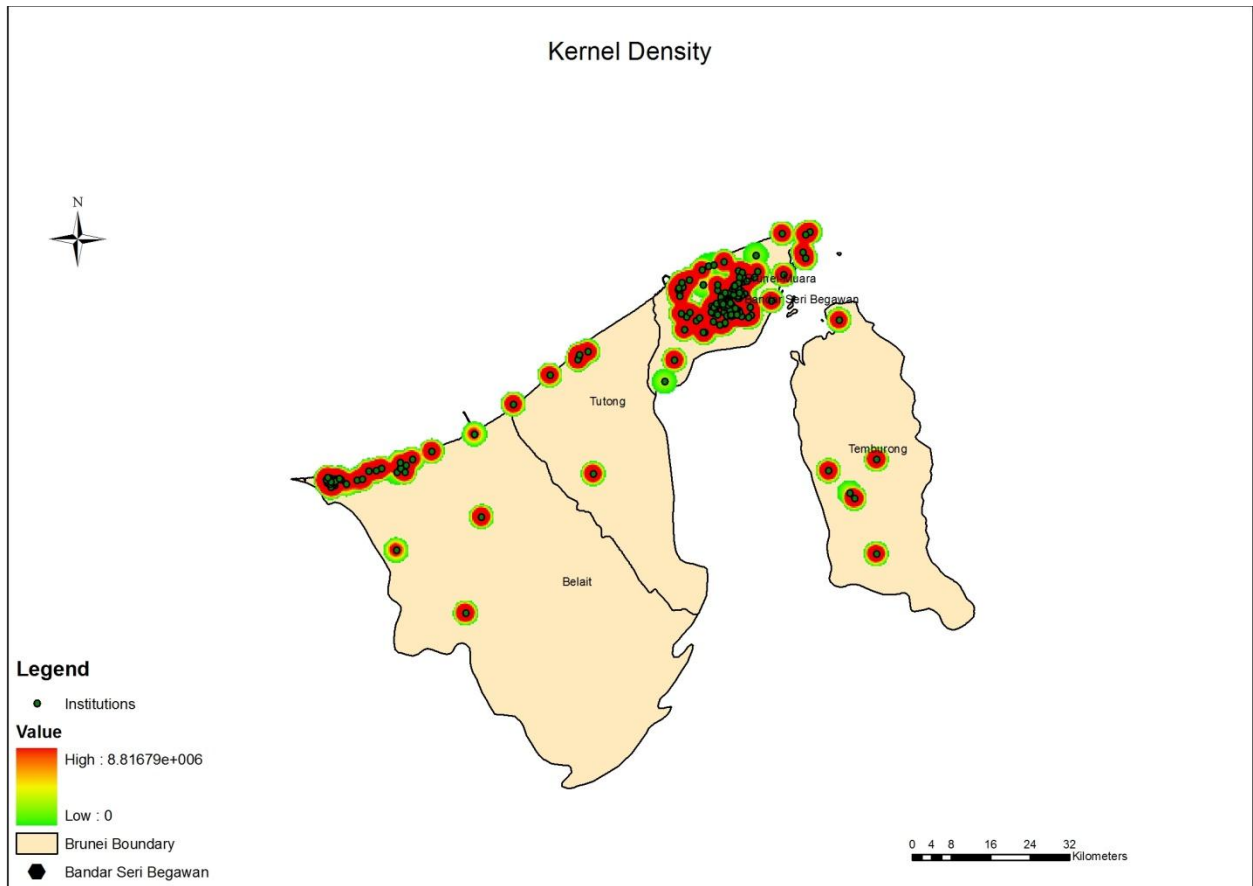




Map 21. Knowledge-related institutions in Brunei Darussalam: Teaching



Map 22. Knowledge-related institutions in Brunei Darussalam: Teaching



Map 23. This is an initial attempt to produce a density map showing the clustering of all k-institutions and cultural attractions in Brunei Darussalam. This map clearly brings out the intensity of the agglomeration of institutions in Brunei-Muara District.

In producing these maps, the first task constituted downloading shape files of Brunei Darussalam from the Diva GIS website and next, obtaining coordinates for the institutions to be mapped. This was done using GOOGLE Earth software. The coordinates were obtained in minutes and seconds which later were converted to decimal degrees and organized in a MS Excel file. The data was later imported to Diva GIS using the Data menu and selecting the option import points to shape files and finally selecting the option from Excel. With this, a new layer is created for the institutions denoted by the circular shapes and distinguished from each other by different colours. For a detailed documentation of the Diva GIS programme see <http://www.diva-gis.org/> , for ArcGIS see <http://www.esri.com/software/arcgis> .

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