

# Analysis of Examination Location with Spatial Approach

(Study in UPBJJ-UT Lampung, Surakarta, Makassar and Banjarmasin  
in Universitas Terbuka)

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**Abstract**—This research report contains the presentation of examination location analysis in four UPBJJ-UT (Lampung, Surakarta, Makassar, and Banjarmasin) with spatial analysis approach. To map the examination location by utilizing facility in google earth which have a similar principle with GIS (Geographic Information System). The spatial data from the fourth UPBJJ-UT including location and distance can be stated by using coordinate points (longitude and latitude). For UPBJJ-UT Lampung the closest point is SMAN-3 (State Senior High School-3) Kotabumi, North Lampung, and the farthest point is SMA (Private Senior High School) Muhammadiyah Ginting, Tanggamus District. The closest distance of UPBJJ-UT Lampung is 3.19 km from SMPN (State Junior High School) 22 Rajabasa Lampung while the farthest is 134.51 km from SMPN 4 Liwa, Lampung Barat. For UPBJJ-UT Surakarta the closest point is SMKN (State Vocational High School) 1 Boyolali, and the farthest point is SMPN 6 Wonogiri. The closest distance of UPBJJ-UT Surakarta is 1.70 km from SMPN 1 Jaten, and the farthest is 125.59 km from SMPN 2 Sukoharjo. For UPBJJ-UT Makassar the closest point is SMPN 5 Maros district, and the farthest point is SMAN 1 BT Nampo. The closest distance of UPBJJ-UT Makassar is 2.06 km from SMAN 16 Makassar, while the farthest is 21.05 km from SMAN 1 BT Nampo. For UPBJJ-UT Banjarmasin the closest point is SMKN 1 Tanjung Tabalong District, and the farthest is SMKN 1 Pelaihari Tanah Laut District. The closest distance of UPBJJ Banjarmasin is 1.9 km from SMPN 10 Banjarmasin, while the farthest is 180.06 km from SMPN 1 Kotabaru. Accessibility to the examination location whether it is very easy or very hard, stated by the quality of the roads and public facilities. Distribution pattern which is illustrated by cluster distribution map, seems random distributed.

**Keywords**—Analysis, examination location, spatial approach

## I. INTRODUCTION

Equalization Program and improving the quality of human resources in Indonesia, each region has the opportunity to promote the Organization of education in their respective territories. The policy of regional autonomy in the field of education, to develop people's interest to continue to higher

education, whether in the form of universities, high schools or junior colleges. The implementation of these policies is not fully enforceable by each area due to the constraints of geographical condition of Indonesia which consists of the Mainland and Islands that requires management and coordination difficult. The Community is located in the remote region, either the Mainland or islands that would like to continue to College, and can not follow the lecturer face-to-face, because of the constraints geographically then Universitas Terbuka as an open long distance education in Indonesia, giving the opportunity to all communities are scattered throughout the territory of the motherland, without limited by geographic region, age, occupation, or graduate year the status of the social.

UT College Open Office has a Unit distance learning Program (UPBJJ-UT) which was originally only 37 provinces later developed into 39 provinces with the addition of IE UPBJJ-UT Slide and UPBJJ-UT abroad. The role of UPBJJ-UT as the Office Manager and administrative service assistance and academic administrative services for students attending at the Universitas Terbuka. Geographically the potential students of the Universitas Terbuka run by each UPBJJ-UT is the city of district, sub-district to level the neighborhood. For administrative services such as: registration, distribution, (acquire learning materials, and test materials), while the academic services such as: learning materials (printed and non-printed), learning support (face-to-face tutorials, online tutorials), as well as evaluation (conducting exam classes and online), one form of academic service run by each UPBJJ-UT is the implementation of the test are synchronously executed in all UPBJJ-UT who placed in various places and locations that Regency good exam. Friday in the region UPBJJ-UT respectively. For the determination of the location of exam to date based on the terms of the number of students who take the test, public facility (cleanliness, seating, lighting, and environmental factors). With regard to the place of examination in some areas UPBJJ-UT in particular four UPBJJ-

UT (Surakarta, Bandar Lampung and Banjarmasin, Makassar) to date have not done research using an approach to the geography that is analyzed by using a spatial analysis approach.

Spatial Analysis is indispensable for Manager in UPBJJ-UT related: layout, accessibility, distance and travel time, for students to go to the location of the test, information. This is very important for the Universities Terbuka, to look at affordability by considering the distance and time it takes students to the exam location with central point Office UPBJJ-UT. The results of the analysis of this form of technology products that directly can be utilized by policy makers at the University for considering exam locations easily accessible by students, which can be displayed in the form Location map Exam in UPBJJ-UT Surakarta, UPBJJ-UT Lampung, UPBJJ-UT Banjarmasin and UPBJJ-UT Makassar. Purpose carried out this Research in General to improve fundamental research/academic field of geography deals with spatial analysis taking into account the factors of layout, accessibility (affordability), distance and travel time. Based on the above issues, the team consists of research wanted to do research on the location Analysis the exam with the approach of spatial a study or studies on UPBJJ-UT Surakarta, UPBJJ-UT Lampung, UPBJJ-UT Banjarmasin and UPBJJ-UT Makassar at Universitas Terbuka.

## II. METHOD

### A. Data Collection Techniques

This research was conducted in four the location of the UPBJJ-UT i.e. UPBJJ-UT Surakarta, UPBJJ-UT Bandar Lampung, UPBJJ-UT Banjarmasin, and UPBJJ-UT Makassar. Spatial Data and non-spatial analysis with the spatial approach (spatial analysis).

### B. Determine the Location Coordinates

To determine the location on the map the place and location of exams in each UPBJJ-UT used Google earth, with the following steps:

- Download Google earth program and then specify a location for the test place searched (the intended school address) at UPBJJ-UT
- Template on Google earth will show up the location coordinates (latitude and longitude) of the place and location of exams in each UPBJJ-UT.
- On the program Google earth search there are several display location icon, click the distance to find a ruler, and then select line, and replace the selected size in kilometers.
- On the map, the place a sought after exams at the click 2 times on the location you selected, and then comes the

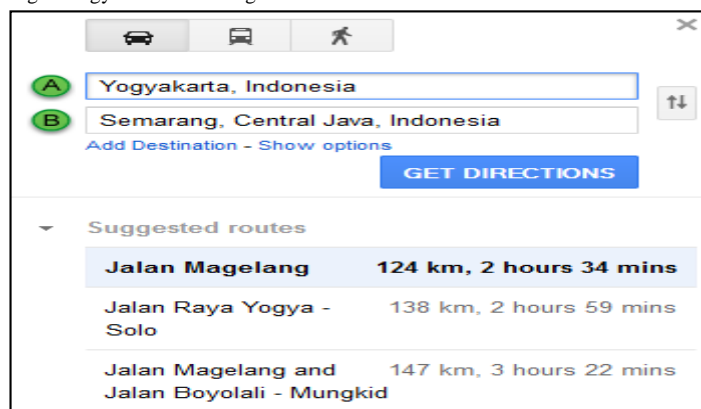
boxes then click 2 times distance is the intended location, and so on.

- To see the results of the distance on the map, click, and then choose print screen program paint then paste it, and then save the picture with the save us on jpg. then save the folder picture.
- The result will appear as such on the Map image below

### C. Calculation of the Distance between the Two Lines Point on Google Maps

Calculation of distances on Google Maps, does not calculate the distance based on a straight line from the starting point to the destination point, but counting a program of Equalization and improvement of the quality of human resources in Indonesia, each region has the opportunity to promote the Organization of education in their respective territories. The policy of regional autonomy in the field of education, growth people's interest to continue to higher education, whether in the form of universities, high schools or junior colleges. The implementation of these policies is not fully enforceable by each area due to the constraints of geographical condition of Indonesia which consists of the Mainland and Islands that requires management and coordination difficult. The community is located in the remote region, either the Mainland or islands that would like to go on to College, and not be attending face to face, because of geographical constraints then the Universitas Terbuka as a long-distance open education in Indonesia, giving the opportunity to all communities are scattered throughout the territory of the motherland. For example in the search for a route between Yogyakarta and Semarang with the option of driving a car, then on Google Maps will display your route the route may be taken along with the approximate distance and time taken from each route. On view is the default, will be shown with the shortest distance route, namely the route via Magelang Street.

Fig 1. Yogyakarta-Semarang Route



Choose the shortest path (via Magelang Street), Google Maps will calculate the distance based on *waypoint* as follows (with the initial point- 7.794337, 110.368452):

TABLE 1. CALCULATION OF DISTANCE BASED ON THE WAYPOINT

1	-7.798695,110.369348	67 m	21	-7.243577,110.395939	3.3 km
2	-7.793688,110.367782	750 m	22	-7.230081,110.374653	1.4 km
3	-7.789235,110.369799	189 m	23	-7.222375,110.374267	1.0 km

### III. FINDING AND DISCUSSION

#### A. An Overview Of Research Area

The research was carried out in four work areas UPBJJ-UT or in four provinces in Indonesia include: UPBJJ-UT Surakarta represents UPBJJ-UT found in Java, Lampung UPBJJ-UT represents UPBJJ-UT that there in Sumatra, Makassar UPBJJ-representing UPBJJ-UT found in Celebes, Banjarmasin UPBJJ-UT and represent UPBJJ-UT in Borneo.

- Place the examination in UPBJJ-UT

Surakarta is located at the point of coordinates -7.581619 LS, and 110.904020 BT, covering eight test centers namely: in Surakarta, Sukoharjo, Klaten, Boyolali, Karanganyar, Wonogiri, Salatiga and Grobogan. While the distribution of test locations are in some schools as listed in the following table.

TABLE 2. COORDINATES, DISTANCE TEST LOCATION IN UPBJJ – UT SURAKARTA

No	District/ City	Location for Test	Address	Distance to Site (KM)
a	Surakarta	SMP Negeri 24 Surakarta	Jl. Dr. Muwardi 57139	10,91
		SMP Negeri 25 Surakarta	Jl. Dr. Moewardi No. 36 Jawa Tengah	10,93
b	Sukoharjo	SMP Negeri 2 Sukoharjo	Jl. Slamet Riyadi,Begajah ,Sukoharjo, Jawa Tengah 57511	125,59
c	Klaten	SMK Negeri 1 Klaten	Jl. Dr. Wahidin Sudiro Husodo No. 22, Jawa Tengah 57432	35,47
d	Boyolali	SMK Negeri 1 Boyolali	Jl. Perintis Kemerdekaan,Boyolali	34,62
e	Karanganyar	SMPN 5 Karanganyar	Jalan Lawu Nomor 368 Karanganyar Jawa Tengah	4,93
		SMPN 1 Jaten	Jl. Solo Tawangmangu, Jaten, Karanganyar, Jawa Tengah 57731	1,70
g	Wonogiri	SMAN 1 Wonogiri	Jl. Perwakilan No.24 Kec. Wonogiri Jawa Tengah 57612	26,16

No	District/ City	Location for Test	Address	Distance to Site (KM)
		SMP Negeri 6 Wonogiri	SMP Negeri 6 Wonogiri Jl. Kepodang V. Wonogiri	26,73

- Place the examination in UPBJJ-UT Bandar Lampung

Bandar Lampung is located at Coordinates-5.365945 LS 105.267623, BT, and includes the 7th place of the exam are: District Rajabasa, Tanggamus, Lampung Utara, Metro City, West Lampung, East Lampung and Pringsewu. While the distribution of the test locations are found in some schools as

TABLE 3. LAYOUT COORDINATES, DISTANCE TEST LOCATION IN UPBJJ-UT BANDAR LAMPUNG

No	District/City	Location for Test	Address	Distance to Site (KM)
a	Rajabasa	SMPN 22 Bandar Lampung	Jl. Hi. Zainal Abidin Pagar Alam No. 109 Rajabasa Lampung	3,19
b	Kab. Tanggamus	SMA Muhammadiyah Gisting	Jln. Landbaw Kec. Kab.,Gisting Bawah	61,19
c	Lampung Utara	SMAN 3 Kota bumi	Kota Alam,Kotabumi Sel.,Lampung Utara, Lampung 34519	72,73
d	Kota Metro	SMA Utama Wancana	Mulyojati, Metro Bar. Kota Metro 34126	25,75
e	Kab. Lampung Barat	SMPN 4 Liwa	Padang Dalom,Balik Bukit,Lampung Barat 34575	134,51
f.	Kab. Lampung Timur	SDN 1 Sukadana Pasar	Pasar Jembat Batu, Desa Putra Aji 1,Ps. Sukadana, Sukadana, Lampung Timur, Lampung 34386	51,76
g.	Kab. Pringsewu	SMP 11 Maret Ambarawa	Jl. Raya Joyo Dirjo, RT 001/03,Pringsewu, Lampung	34,76

- Place the examination in UPBJJ-UT Makassar

Makassar is located at Coordinates-5.148768 LS, and BT 119.425990, covers 3 place the test as follows: in the city of Makassar, district of Maros County and Goa. While the distribution of the test locations is found in some schools as listed in the following table.

TABLE 4. LAYOUT COORDINATES, DISTANCE EXAM LOCATION

IN UPBJJ – UT MAKASSAR				
No	District/ City	Location for Test	Address	Distance to Site (KM)
a.	Kota Makassar	SMA Negeri 16	Jl. Amanagappa No.8 Kota Makassar, Sulawesi Selatan 90115	2,06
b.	Kab Maros	SMP Negeri 5	Jl. Poros Makassar-Maros KM.23 Mandai Kabupaten Maros, Sulawesi Selatan 90552	18,42
c.	Kab. Gowa	SMA Negeri 1 BT Nempopo	SMA Negeri 1 BT Nempopo JL Bonto Nempopo, Tamalayang, Bottonempopo 90221	21,05

• *Place the test in UPBJJ-UT Banjarmasin*

Banjarmasin is located at Coordinates-3.299795 LS, and BT 114.604649, covering 13 places of examination: in district Banjarmasin, Batola, Tanah Laut, Ground Spices, Kota Baru, Banjarbaru, Banjarmasin, Tapin, Hulu Sungai Selatan, Hulu Sungai Tengah, Hulu Sungai Utara, Balangan, and Tabalong. While the distribution of the test locations are found in some schools as listed in the following table:

TABLE 5. LAYOUT COORDINATES, DISTANCE EXAM LOCATION IN UPBJJ– UT

No	District/ City	Location for Test	Address	Distance To Site (KM)
a.	Banjarmasin	SMPN 10 Banjarmasin	Jl. Aes Nasution, Banjarmasin Tengah,Kota Banjarmasin, Provinsi Kalimantan Sel. 70122	1,93
b.	Kab. Tanah Laut	SMKN 1 Pelaihari	Jl. Gagas Komplek Perkantoran	58,34
c	Kab. Tanah Bumbu	SMKN 1 Simpang Empat	Transmigrasi Km. 7, Sarigadung, Simpang Empat, Kab. Tanah Bumbu, 72171, Kota baru pulau laut	180,03
d.	Kota Baru	SMPN 1 Kotabaru	Semayap, Pulau Laut Utara,Kota Baru, Provinsi Kalimantan Sel. 72113	180,06
e.	Banjarbaru	SMPN 1 Banjarbaru	Jalan Pangeran Surianata No 4,South Kalimantan 70713	29,30
f.	Banjar	SMPN 1 Martapura	JL. Ahmad Yani, No. 59 A, 70614, Martapura, Provinsi Kalimantan Sel. 70614	29,88
g.	Tapin	SMAN 1 Rantau	Jl. Brigjen H. Hasan Basry No 3. Rantau	75,06
h.	Hulu Sungai Selatan	SMKN 1 Kandangan	JL. Batuah, No. 41, Tibung Raya Kandangan, Hulu Sungai Selatan, 71213	92,21

*B. The Pattern of Distribution of The Location of the Examination in UPBJJ-UT Surakarta, Lampung, Banjarmasin and Makassar*

Distribution patterns indicate the place and location of the exam contained UPBJJ-UT Bandar Lampung, Surakarta, Makassar and Banjarmasin can be mapped in the following image.

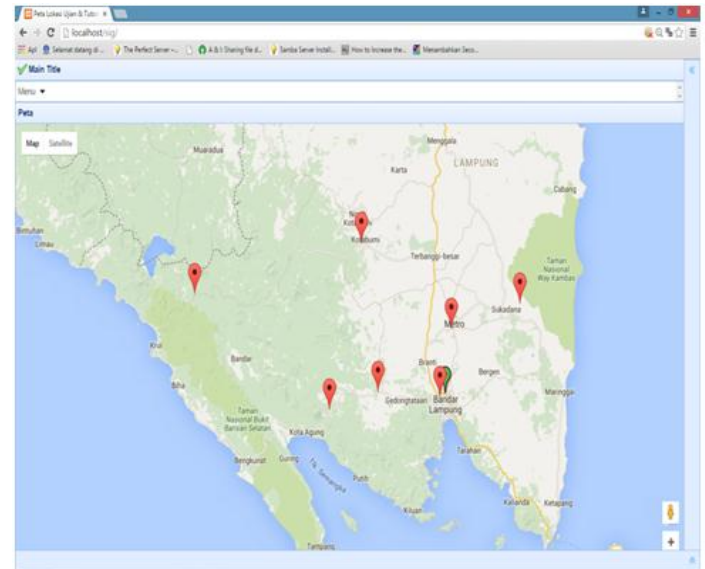


Fig. 2. Map of the dispersion pattern of the location for exam in UPBJJ-UT Bandar Lampung

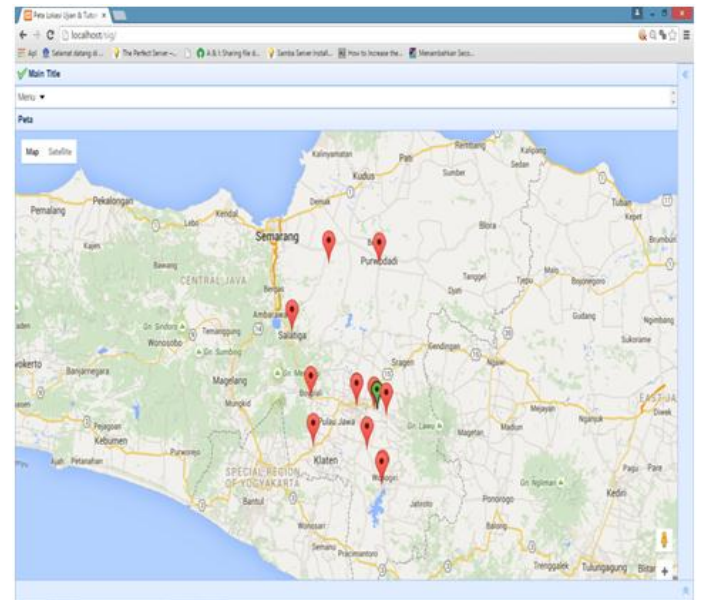


Fig. 3. Map of the dispersion pattern of the location for exam in UPBJJ-UT Surakarta



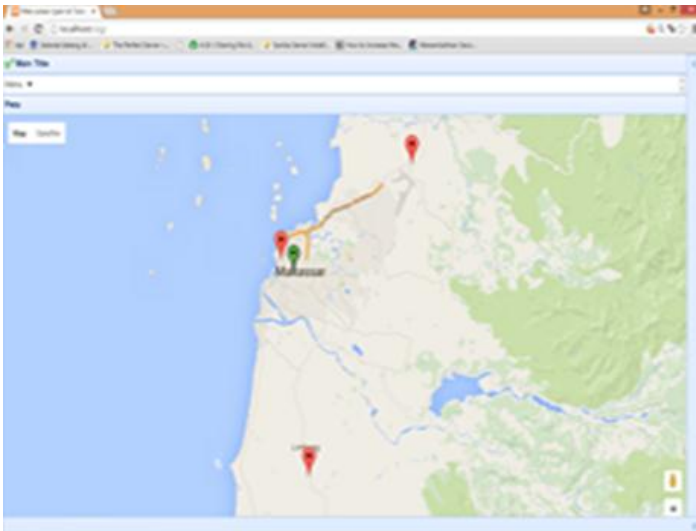


Fig 4. Map of the dispersion pattern of the Location for Exam in UPBJJ-UT Makassar

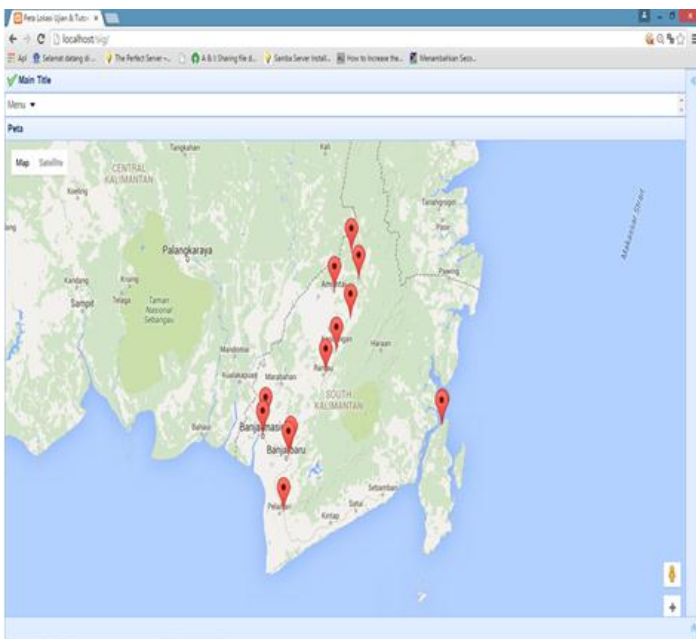


Fig 5. Map of the dispersion pattern of the Location for Exam in UPBJJ-UT Banjarmasin

Based on the results of the spatial analysis against the location, accessibility, distance and travel time to the location of the examination in Lampung, UPBJJ-UT Surakarta, UPBJJ-UT Banjarmasin and Makassar UPBJJ-UT can be outlined as follows.

### C. Analysis of the Location, Accessibility, and The Distance of the Location for Test

- UPBJJ-UT Surakarta spatial analysis results as follows:

- a. Based on the location of the coordinates are in the following positions:
  - Closest point at coordinates -7.541949 LS-110.593692 BT was the location of the SMK N 1 Boyolali
  - The farthest Point at coordinates -7.821036 LS-110.924554 BT layout of 228 6 Wonogiri
- b. The distance of the examination location
  - The closest distance to the location of the test is 1.70 km is the distance to the SMP 1 Jaten
  - The farthest distance to the location of the test is 125.59 km is the distance to the SMP 2 Shorkot

- UPBJJ-UT Lampung spatial analysis results as follows:

- a. Based on the location of the coordinates are in the following positions:
  - Closest point at coordinates-4.838826 LS- 104.876466 BT was the location of SMAN 3 Kotabumi North Lampung
  - The farthest Point at coordinates-5.415909 LS-104.729648 BT is the layout of the SMA Muhammadiyah Ginting Tanggamus Regency
- b. The distance of the exam location
  - The closest distance to the location of the test is 3.19 km is the distance to the SMP Lampung Rajabasa 22
  - The farthest distance to the location of the test is 134.51 is the distance to the 4th Liwa SMP west Lampung.

- UPBJJ-UT Makassar spatial analysis results as follows:

- a. Based on the location of the coordinates are in the following positions:
  - Closest point at coordinates -5.049138 LS-119.558803 BT was the location of SMP 5 Maros
  - The farthest Point at coordinates -5.336822 BT-119.443750 BT was the location of the SMA Negeri 1 TA Nampo.
- b. The distance of the test location
  - The closest distance to the location of the test is 2.06 km distance to SMAN 16 Makassar
  - The farthest distance to the location of the test is 21.05 km distance to SMAN 1 TA Nampo

- UPBJJ-UT Banjarmasin spatial analysis results as follows:

- a. Based on the location of the coordinates are in the following positions:
  - Closest point at coordinates-2.177006 LS-115.400369 BT was the location of the SMKN 1 Tanjung Tabalong Regency
  - The farthest Point at coordinates -3.796161 LS-114.783517-BT Banjarbaru Pelaihari District land sea
- b. The distance of the location of the test

- The closest distance to the location of the test is a 1.9 km distance to 228 10 Banjarmasin
- The farthest distance to the location of the test is 180.06 km distance to SMPN1 of Kotabaru

#### D. The Accessibility of the Location for Test

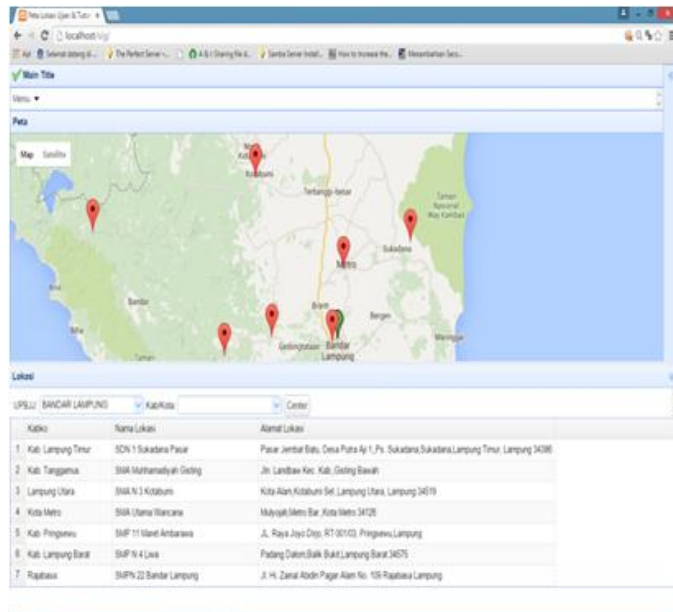


Fig 6. Distribution map of the test location in UPBJJ-UT Surakarta

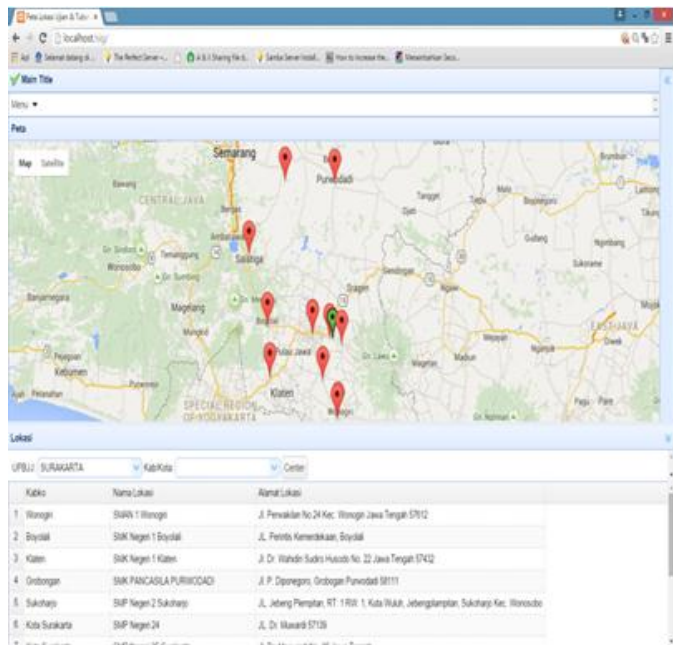


Fig 7. Distribution map of the exam location in UPBJJ-UT Bandar Lampung

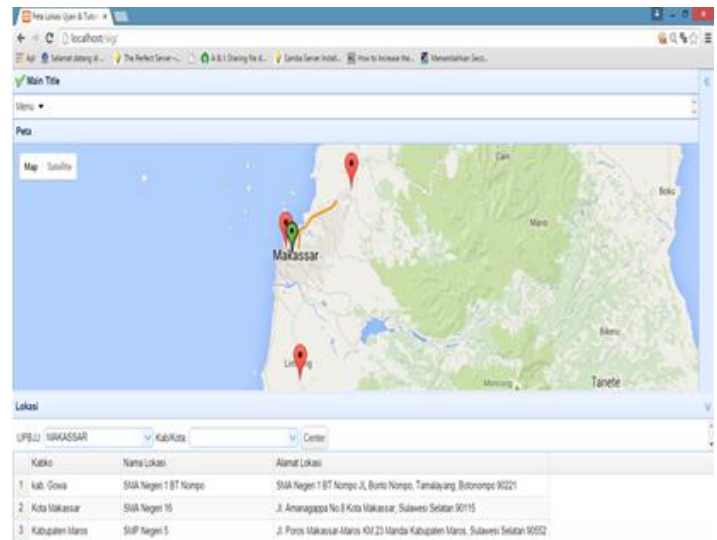


Fig 8. Distribution map of the test Locations in UPBJJ-UT Makassar

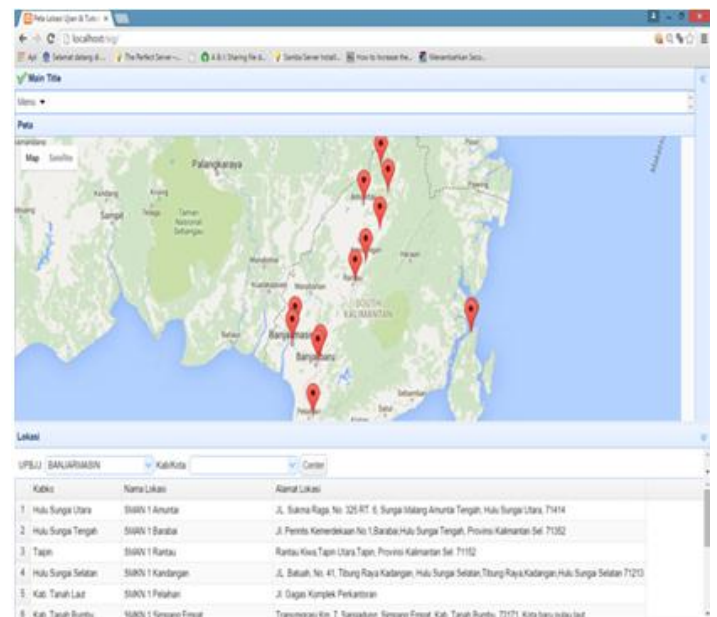


Fig 9. Distribution map of the test Location in UPBJJ-UT Banjarmasin

For accessibility to the exam location do confirm with students exam participants through the interview against the 10 students from the four UPBJJ Lampung, Makassar and Banjarmasin Surakarta, from two different exam location. The elements of accessibility of the elements – seen from a distance, travel time, speed and costs incurred. The result can be seen in the following table.

TABLE 6. ACCESSIBILITY IS SEEN FROM A DISTANCE, TRAVEL TIME, SPEED, AND COST

UPBJJ	Distance (km)		Travel time (hours)			Speed Km/ (hour)			Cost (USD)		
	N	F	L	M	H	L	M	H	L	M	H
Lampung	30 %	70 %	50 %	30 %	20 %	40 %	40 %	20 %	30 %	50 %	20 %
Surakarta	60 %	40 %	70 %	20 %	10 %	50 %	30 %	20 %	40 %	30 %	30 %
Makassar	30 %	70 %	50 %	30 %	20 %	30 %	50 %	20 %	30 %	20 %	50 %
Banjarmasin	30 %	70 %	30 %	40 %	30 %	40 %	30 %	30 %	20 %	30 %	50 %

Note: N = Near, F= far, L = Low, M = Medium, H = High

#### E. Analysis of the Distribution Patterns of the Location of the Examination in UPBJJ-UT Surakarta, Lampung and Banjarmasin, Makassar

Search results based on the location of the test with Google Earth that Map the spread in four UPBJJ-UT such as follows:

- Map of the distribution of the test location in Surakarta UPBJJ-UT contained in 9 test location with uniform pattern (*regular*)
- Map of the distribution of the test site in Bandar Lampung UPBJJ-UT is in 7 test location with random patterns (*random*)
- Map of the distribution of the test location at UPBJJ-UT UPBJJ-UT Makassar in 3 location test with random patterns (*random*)
- Map of the distribution of the test location at UPBJJ-UT UPBJJ-UT Banjarmasin there are 13 locations in the exam with the pattern of *clusters* (*cluster*)

### IV. CONCLUSIONS AND SUGGESTION

#### A. Conclusions

- Layout of the latitude of the location and place of exams in UPBJJ-UT nearest to farthest Lampung are on point - 4.838826 LS- 5.415909 LS, Surakarta, at latitude- 7.541949 LS-7.821036 LS, Makassar, at latitude- 5.049138 LS-5.336822 BT whereas, Banjarmasin, at latitude-2.177006 LS-3.796161 LS
- Layout of the longitude of the location and place of exams in UPBJJ-UT nearest to farthest Lampung are on point - 4.838826 LS- 5.415909 LS, Surakarta, at latitude- 7.541949 LS-7.821036 LS, Makassar, at latitude- 5.049138 LS-5.336822 BT whereas, Banjarmasin, at latitude-2.177006 LS-3.796161 LS
- The distance of the location and the nearest and farthest exam venues.

- UPBJJ-UT Lampung, closest to the location of the exam is 3.19 km distance to 228 22 Rajabasa Lampung, the furthest is 134.51 km that is the distance to the SMP 4 Liwa West Lampung.
- UPBJJ-UT Surakarta, closest to the location of the exam is 1.70 km is the distance to the farthest Jaten, 1 228 is 228 km to the 125.59 2 Sukoharjo.
- UPBJJ-UT the nearest distance to the location of the Makassar trials is 2.06 km IE to 16 farthest Makassar, SMAN is 21.05 km to SMAN 1 TA Nampo.
- UPBJJ-UT Banjarmasin, the nearest distance to the location of the test is a 1.9 km i.e to 228 10 Banjarmasin, the furthest is 180.06 km to SMPN1 of Kotabaru.

- Accessibility to the location of the four exams UPBJJ based on:
  - The distance, as many as 30% of the sd 60% < 30 km distances near and far, > 30 km, as much as 70% unless Surakarta 40%.
  - Low travel time between 0.5 – 1 hour, as much as 30%, 50%, and 70% and travel time are between 2-5 hours, as much as 20%, 30% and 40%, and high travel time  $\geq 5$  hours, that is as much as 10%, 20% and 30%.
  - Low and medium speed by as much as 30%, 40% and 50%, while at high speed by as much as 20% and 30%.
  - The low cost of travel i.e.  $\leq$  Rp 25,000.0-as much as 20%, 30% and 40%, medium cost i.e. Rp 25,000.0 Rp-s. 50,000.0-as much as 20%, 30% and 50%, and the cost is high i.e.  $\geq$  Rp 100,000.0-as much as 20%, 30% and 50%
- Map of the distribution of the test location in Surakarta UPBJJ-UT has a uniform pattern (*regular*), for the location of the examination in Lampung and UPBJJ-UT UPBJJ-UT Makassar have random patterns (*random*), while for the location of the examination in UPBJJ-UT Banjarmasin have clumped pattern (*cluster*).

#### B. Suggestion

- Researchers who want to map out an environmental phenomenon can take advantage of the SIG you can upload from Google Earth.
- This is early Research Results that can be followed up with the same research with the utilization of GIS were soft.

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