Utilization of GNSS RTK-SMART TB5 as a Low-cost GNSS Receiver for Land Surveying

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Key words: Land Surveying, Low-cost GNSS Receiver, RTK-NTRIP

SUMMARY

Changes in policy direction within the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN) which require land parcels measurement with high target to be carried out quickly, demand an effective work management component. One of them is the material component, namely the procurement of the Global Navigation Sattelite System Real Time Kinematic (GNSS RTK) which is able to produce coordinates accurately in a short time. Utilizing RTK SMART TB5 as a low-cost GNSS receiver can be an option for measuring parcels of land. This study aims to test the accuracy of observations using the RTK SMART TB5 with RTK-Networked Transport of RTCM via Internet Protocol (NTRIP) method. The used research method is comparing the coordinates of the RTK SMART TB5 using RTK-NTRIP method with the coordinates of the static method. The study was carried out by taking 96 sample points in the agricultural area based on the range of 0-5 kms, 5-10 kms and 10-15 kms from the base station of Continously Operating Reference Station (CORS) in Sleman Regency Land Office. The results of statistical analysis show that there were significant differences in the coordinates of the two methods, but they are still below the tolerance required by PMNA/KBPN Technical Guideline Number 3 of 1997 of 0,250 m. The result of coordinates that are collected by SMART TB5 with RTK-NTRIP method have good accuracy.

RINGKASAN

Perubahan arah kebijakan di tubuh Kementerian Agraria dan Tata Ruang/Badan Pertanahan Nasional (ATR/BPN) yang menuntut pengukuran bidang tanah dilaksanakan secara cepat dan target tinggi, perlu komponen manajemen kerja efektif. Salah satunya komponen material, yaitu pengadaan *Global Navigation Sattelite System Real Time Kinematic* (GNSS RTK) yang mampu menghasilkan koordinat secara akurat dalam waktu singkat. Pemanfaatan RTK SMART TB5 sebagai receiver GNSS berbiaya rendah dapat menjadi opsi pengukuran bidang tanah. Penelitian ini bertujuan menguji ketelitian hasil pengukuran menggunakan RTK SMART TB5 metode RTK-*Networked Transport of RTCM via Internet Protocol* (NTRIP). Metode penelitian yang digunakan yaitu membandingkan koordinat RTK SMART TB5 metode RTK-NTRIP dengan koordinat metode statik. Penelitian dilakukan dengan mengambil 96 titik sampel pada area pertanian berdasarkan jangkauan 0-5 km, 5-10 km dan 10-15 km dari base station *Continously Operating Reference Station* (CORS) Kantor Pertanahan Kabupaten Sleman. Hasil analisis statistik menunjukkan terdapat perbedaan signifikan pada koordinat kedua metode, akan tetapi masih di bawah toleransi yang disyaratkan Petunjuk Teknis PMNA/KBPN Nomor 3 Tahun 1997 sebesar 0,250 m. Koordinat hasil pengukuran SMART TB5 metode RTK-NTRIP mempunyai akurasi yang baik.

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1. INTRODUCTION

Since the era of the Complete Systematic Land Registration (PTSL) program starting in 2017, it has led to a change in the direction of policy within the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN). The government, in this case the Ministry of ATR/BPN, has the obligation to complete this accelerated land registration program with the target set at the highest compared to previous years (Abdullah 2018, 83). Effective work management components are needed for the success of PTSL activities, one of which is the material component, namely the development of survey equipment in measuring land parcels. The Directorate General of Agrarian Infrastructure (Dirjen IK) of the Ministry of ATR/BPN responded to this by procuring RTK GNSS from 2018 to July 2019, page of www.bpn.go.id reported that a total of seven thousand units had been distributed to all regional offices of The National Land Agency (Kanwil BPN) and district/city land offices (kantah districts/cities) throughout Indonesia as well as the National Land College (STPN).

The fact that the selling price of RTK GNSS packages belonging to foreign vendors in the marketplace is currently still high has made low-cost GNSS to be developed by domestic researchers. This GNSS price of less than $ 2,000 (< Rp 28,000,000.00) is much lower than that of a typical GNSS receiver with prices over $ 40,000 (> Rp 560,000,000.00) (Bramanto et al. 2016, 139). A low-cost GNSS receiver is a type of receiver GNSS that is capable of observing GNSS satellite wave data with certain specifications (Surakhman 2017, 1). The capabilities of a low-cost GNSS receiver are further enhanced by the addition of the capability to capture the Beidou (B1) satellite (Odolinski and Teunissen 2017, 1315). One of the low-cost RTK GNSS receiver is the SMART TB5 which is a modification to the development of the GNSS module which is connected to an internal antenna and a smartphone as the controller and the data acquisition is carried out based on commands in software based android: Smart PTSL.

Yasin (2008) in Safi'i and Aditya (2017) states that the GNSS RTK-NTRIP measurement is different from conventional RTK in terms of data communication. The conventional RTK GNSS uses radio as a communication tool between the base and the rover, while the RTK-NTRIP has the advantage of the continuous data correction transmission method in the format Radio Technical Commission for Maritime Services (RTCM) and can be accessed in real time using the internet network capable of measuring with longer distance from the base station. The Utilization of RTK SMART TB5 receiver in the activity of land parcels measurement, it is necessary to be tested to determine the accuracy and feasibility of measurement results using the RTK-NTRIP method which is tied to the base station CORS of the Sleman Regency Land Office, whether there is a significant difference between the coordinates of the measurement results of the RTK SMART TB5 RTK-NTRIP method with static coordinates as comparative data and whether the measurement results meet the tolerance of PMNA/KBPN Technical Guidance Number 3 of 1997.

This research was conducted with a comparative experiment, namely comparing the coordinates of the RTK SMART TB5 measurement results against static coordinates. The total measured samples were 96 points of land parcel boundary in agricultural areas spread over several villages in three classifications of distance from the base station, namely Triharjo Village, Sleman District and Caturharjo Village, Sleman District, in a range of 0-5 km, Margodadi Village, Seyegan District and Sidorejo Village, Godean District, in a range of 5-10 km, and Sumberagung Village, Moyudan District, in a 10-15 km range. Research steps were through three stages, namely: planning and preparation, collecting data field and analysing of differences in the coordinates of the measurement results. The research flow diagram can be seen in Figure 1.

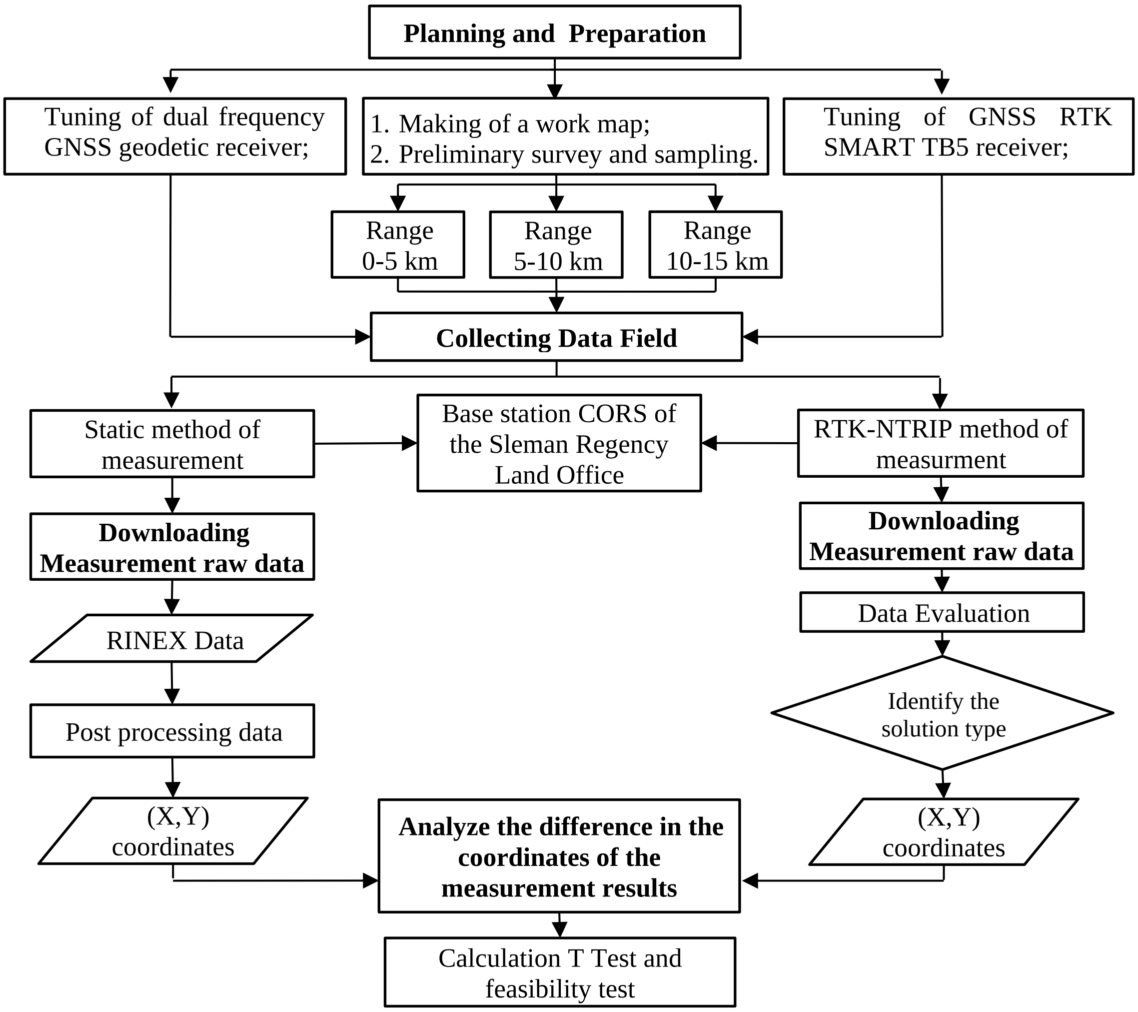

Figure 1. The research flow diagram
Source: Processed by Researchers in March 2020

The *first* step is planning and preparation include making work map, preliminary survey and sampling, tuning of dual frequency GNSS geodetic receiver and GNSS RTK SMART TB5 receiver. The equipment used in this study included: 7 units GNSS CHCNav i50 receiver, 1 unit GNSS RTK SMART TB5 receiver, 1 unit smartphone brands Realme 3 Pro installed with Smart PTSL application, laptops brands Acer Aspire E14 installed with software Leica Geo Office (LGO) CHC Data version 2.1, Trimble Business Center (TBC) version 5.2, Autodesk Map 3D 2012, and Microsoft Office. The *second* step is collecting data including measurements using GNSS CHCNav i50 receiver with radial static method for 4 days with observation time for each point for ± 60 minutes and measurements using GNSS SMART TB5 receiver with RTK-NTRIP method for 2 days with observation time for each point for ± 1 minute and tool height of 2 m. The two measurement methods are tied to the base station CORS of the Sleman Regency Land Office. The *third* step is processing data including downloading raw data for the measurement of the static method, converting the data into RINEX format, processing data by post processing and downloading data using RTK-NTRIP method. All steps were successfully carried out and produced coordinate values (x,y) in Transverse Mercator (TM-3°) projection system and 49.1 zone for both measurement methods. The coordinates of RTK-NTRIP method were then carried out statistical analysis of the coordinates of the static method as coordinates which are considered correct.

2. ACCURACY OF MEASUREMENT RESULTS USING GNSS RTK SMART TB5 RECEIVER WITH RTK-NTRIP METHOD

Measurement and data processing of the two methods produce two different coordinate values (x,y) for each boundary point of the land plane, namely the coordinates of the measurement results using GNSS RTK SMART TB5 receiver with RTK-NTRIP method and the coordinates of the measurement results using CHCNav i50 receiver with the static method.

2.1 Value and Direction of Lateral Difference of RTK SMART TB5 Coordinates to Static Coordinates

Values and directions of lateral differences between RTK SMART TB5 coordinates to static coordinates at 0-5 km, 5-10 km and 10-15 km ranges are presented in table 1, table 2 and table 3.

Table 1. Value and Direction of Lateral Difference between RTK SMART TB5 Coordinates and Static Coordinates in the 0-5 Km Range

	Coordinates Difference		Lateral Difference	Direction		
	ΔXi (m)	ΔYi (m)	ΔLi (m)	°	'	"
Average	0.012	0.014	0.035	40	36	24.862

Source: Primary Data Processing on April 2020

Table 1 shows that in a range of 0-5 km the value of the difference in coordinates at the abscissa (ΔX) averages is 0.012 m and in the ordinate (ΔY) averages is 0.014 m. Lateral difference value (ΔL) average is 0.035 m towards 40° 36' 24.862" with the smallest value of 0.002 m at point A17 towards 116° 37' 47.668".

Table 2. Value and Direction of Lateral Difference between RTK SMART TB5 Coordinates and Static Coordinates in the 5-10 Km Range

	Coordinates Difference		Lateral Difference	Direction		
	ΔXi (m)	ΔYi (m)	ΔLi (m)	°	'	"
Average	0.023	0.005	0.039	78	11	26.160

Source: Primary Data Processing on April 2020

Table 2 shows that in a range of 5-10 km, the value of the difference in coordinates at the abscissa (ΔX) averages is 0.023 m and in the ordinate (ΔY) averages is 0.005 m. Lateral difference value (ΔL) average is 0.039 m towards 78° 11' 26,160" with a minimum value of 0.007 m at point B22 towards 3° 47' 3.681".

Table 3. Value and Direction of Lateral Difference between RTK SMART TB5 Coordinates and Static Coordinates in the 10-15 Km Range

	Coordinates Difference		Lateral Difference	Direction		
	ΔXi (m)	ΔYi (m)	ΔLi (m)	°	'	"
Average	0.032	0.001	0.042	88	21	17.004

Source: Primary Data Processing on April 2020

Table 3 shows that in a range of 10-15 km, the value of the difference in coordinates at the abscissa (ΔX) averages is 0.032 m and in the ordinate (ΔY) averages is 0.005 m. Lateral difference value (ΔL) average is 0.042 m towards 88° 21' 17.004" with a smallest value of 0.005 m at point C2 towards 280° 3' 29,884".

Based on table 1, table 2 and table 3, it can be seen that there are increases in the value of the lateral difference from the RTK SMART TB5 coordinates to the value of the Static coordinates in the range of 0-5 km, 5-10 km and 10-15 km, proven by the average value of lateral differences at each range the higher as the distance increases from base station. The direction of the shift in the value of the lateral difference occurs randomly between quadrant I (0.1° - 90°), quadrant II (90.1° - 180°), quadrant III (180.1° - 270°) and quadrant IV (270, 1° - 360°), proven by the fact that all treated points have varying lateral directions. The increase in the average value of the lateral difference from the RTK SMART TB5 coordinates to the value of the static coordinates at the range of 0-5 km, 5-10 km and 10-15 km from the Kantah Sleman Regency CORS base station, shows the effect of differences in distance coverage, meaning that the farther the distance from the base station, the accuracy decreases. This is due to the observation geometry factors, those are the number of satellites, the location and distribution of satellites as well as the different observation times between sample points. Hariyoko (2008, 68) states that in the processing of the network of these points, the number and distribution of satellites also affect the accuracy of the position, as evidenced by the number of satellites that can be observed between 7 and 10 satellites that are evenly distributed in 4 quadrants.

RTK SMART TB5 coordinate values against static coordinates that have been free from blunders were tested using paired sample t-test with a significance level (α) of 5% to determine whether there is a significant difference or not. The t test results of the RTK SMART TB5 coordinate values against the static coordinates are presented in table 4, table 5 and table 6:

Table 4. The t test Results of the RTK SMART TB5 coordinate values against the static coordinates in the 0-5 Km Range

T test of 0-5 Km Range				
	Difference in X coordinates		**Difference in Y coordinates**	
	ΔXi (m)	**(ΔXi-ΔX)²**	**ΔYi (m)**	**(ΔYi-ΔY)²**
∑	0.361	0.016	0.375	0.018
Δ	0.012		0.012	
N	31		31	
S	0.023		0.025	
t value	**2.810**		**2.741**	
t table	**2.042**		**2.042**	

Source: Primary Data Processing on April 2020

Based on table 4, it can be seen that the results of the t test for the difference in X coordinates and Y coordinates with a significance level of 5% are three range classifications. In the range of 0-5 km, the t value of X is 2.810 and the t value of Y is 2.741, both values are greater than the t table value of 2.042 and are in the rejection area of Ho.

Table 5. The t test Results of the RTK SMART TB5 coordinate values against the static coordinates in the 5-10 Km Range

T test of 5-10 Km Range				
	Difference in X coordinates		**Difference in Y coordinates**	
	ΔXi (m)	**(ΔXi-ΔX)²**	**ΔYi (m)**	**(ΔYi-ΔY)²**
∑	0.665	0.016	0.059	0.022
Δ	0.021		0.002	
N	31		31	
S	0.023		0.027	
t value	**5.204**		**0.390**	
t table	**2.042**		**2.042**	

Source: Primary Data Processing on April 2020

Based on table 5, it can be seen that the results of the t test for the difference in X coordinates and Y coordinates with a significance level of 5% are three range classifications. In the range of 5-10 km, the value of t count X is 5.204 and the value of t count Y is 0.390, the value of t count X is greater than the value of t table which is 2.042 and in the rejection area Ho while the value of t count Y is smaller than the value of t table and is in the Ho reception area.

Table 6. The t test Results of the RTK SMART TB5 coordinate values against the static coordinates in the 10-15 Km Range

T test of 10-15 Km Range				
	Difference in X coordinates		**Difference in Y coordinates**	
	ΔXi (m)	**(ΔXi-ΔX)²**	**ΔYi (m)**	**(ΔYi-ΔY)²**
∑	0.919	0.015	-0.002	0.017
Δ	0.030		-0.000	
N	31		31	
S	0.023		0.024	
t value	**7.294**		**-0.012**	
t table	**2.042**		**2.042**	

Source: Primary Data Processing on April 2020

Based on table 6, it can be seen that the results of the t test for the difference in X coordinates and Y coordinates with a significance level of 5% are three range classifications. In a range of 10-15 km, the value of t count X is 7,294 and the value of t count Y is -0.012 the value of t count X is greater than the value of t table which is 2.042 and in the rejection area Ho while the value of t count Y is smaller than the value of t table and is in the Ho reception area.

So it can be concluded that at the 5% significance level there is a significant difference between the RTK SMART TB5 coordinate values against the static coordinates. On the basis of the conclusions in the t test above, it can be interpreted that there is a significant difference between measurements using the RTK-NTRIP method using the RTK SMART TB5 receiver compared to the static method.

By looking at the standard deviation value and the average lateral difference, it can be concluded that the measurement accuracy with GNSS RTK SMART TB5 receiver is in the centimeter fraction and is in the good category. The standard deviation value and the mean of the lateral difference have increased with increasing distance from the base station, this indicates a decrease in position accuracy. The accuracy of a position obtained in a GNSS survey generally depends on four factors, namely the accuracy of the data used, the observation geometry, the observation strategy used and the data processing strategy applied (National Standardization Agency 2002). First, the data accuracy factor is influenced by the quality of the GNSS receiver and the level of error and bias. The difference in the specifications of the GNSS CHCNav i50 receiver is able to handle this type of static survey and has 432 channels while the GNSS RTK SMART TB5 receiver is not yet able to handle this type of static survey and only has 184 channels. The level of error and bias occurs due to the location of the point which is close to the highway and under the Extra High Airway (SUTET). William Henning (2008, 27) in (Pradhana 2012, 131) says that multipath error cannot be detected by a rover or modeled on a real time process. Error from multipath will cause error in calculating coordinates. Second, factors of observation geometry are caused by the characteristics baseline in the radial mode which are not closed together in a loop (network) so that there is no quality control and maintaining network strength. Ramadhon

(2015, 42) stated that the average height accuracy is two to three times greater when compared to horizontal accuracy because the GPS satellites that can be observed are only above the horizon (on-side geometry) so that when viewed geometrically it becomes not optimal and there is no elimination of errors in high components. Third, factors of the observation strategy are influenced by the method, length and time of observation. Fourth, processing factors. Static observation data is processed thoroughly from the entire range of the base station. This kind of processing strategy will get worse results than the sequential/partial data processing (Hariyoko 2008, 71).

2.2 Feasibility Test of RTK SMART TB5 Receiver Measurement Result Against PMNA/KBPN Technical Guideline Number 3 of 1997

Feasibility of measurement results is carried out by calculating the difference in side length and area of the land plot of RTK SMART TB5 coordinates to static coordinates presented in table 7 and table 8:

Table 7. The Results of The difference in Side Length of SMART TB5 to Static

Length (km)	Average Difference in Side Length (m)	Tolerance of PMNA/KBPN 3/1997 (m)	Status	Percent (%)
0-5	0.027	0.250	Accepted	100
5-10	0.021	0.250	Accepted	100
10-15	0.021	0.250	Accepted	100
Average	**0.023**			

Source: Primary Data Processing on April 2020

Based on table 7, it can be seen that the calculation results of the difference in land parcel side lengths of the RTK SMART TB5 coordinates to the static coordinates, the entire length of the side or 100% meet the side length tolerance of PMNA/KBPN Technical Guidance Number 3 of 1997 of 0.250 m. The average side length is 0.023 m with the smallest side length 0 m, namely the C20-C17 and C22-C23 sides at a range of 10-15 km while the largest side length is 0.070 m, namely the A8-A7 side at a range of 0-5 km. This shows that measurements with the RTK SMART TB5 GNSS receiver RTK-NTRIP method have good accuracy.

Table 8. The Results of The difference in Land Area of RTK SMART TB5 to Static

Length (km)	Average Difference of Land Area (m^2)	Status	Percent (%)
0-5	1	Accepted	100
5-10	2	Accepted	100
10-15	1	Accepted	100
Average	**1**		

Source: Primary Data Processing on April 2020

Based on table 8, it can be seen that the calculation results of the area difference in 28 land parcels, 100% meet the tolerance of Technical Guidance for PMNA/KBPN Technical Guidelines Number 3 of 1997 of (½√L). The average area of land parcels is 1 m² with the smallest area of 0 m², namely parcels 3, 4, 5 and 10 in the 0-5 km range, fields 12, 16 and 18 in the range of 5-10 km and fields number 23, 24 and 25 at a range of 10-15 km while the largest area is 7 m² which is area number 11 at a range of 5-10 km. This shows that measurements with the RTK SMART TB5 GNSS receiver RTK-NTRIP method have good accuracy.

Based on the results of the calculation of the difference in side length and the calculation of the area of the land parcel from the RTK SMART TB5 coordinates to the static coordinates, all side lengths and the area of the land parcel, 100% meet the tolerance according to PMNA/KBPN Technical Guidelines Number 3 of 1997 for agricultural land so that it can be concluded the RTK SMART TB5 receiver with the RTK-NTRIP method at a range of 0-5 km, 5-10 km and 10-15 km from the CORS base station of the Sleman Regency Land Office have good accuracy.

Sample plot and field situation with the difference in the area and length of the smallest and largest sides shown in Figure 2 and Figure 3.

Figure 2. Sample Plot and Field Situation with the Smallest Difference Area
Source: Processed by Researchers in April 2020

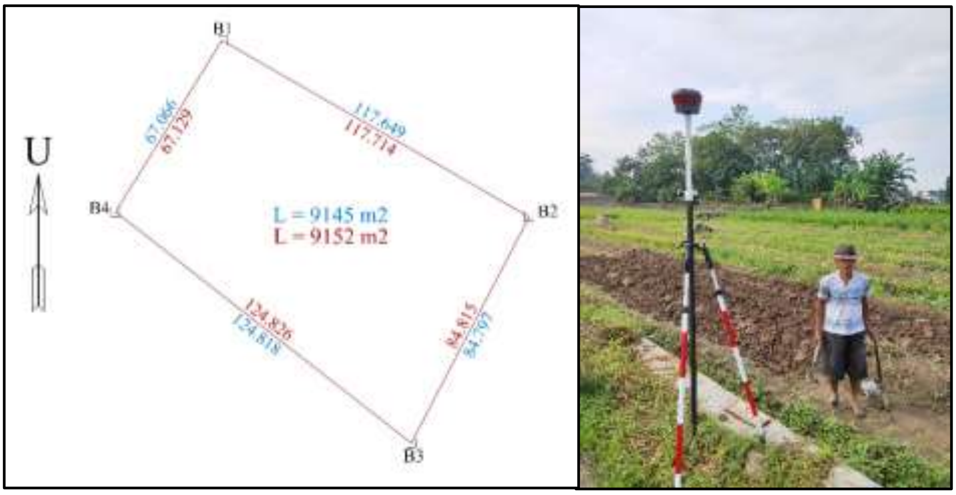

Figure 3. Sample Plot and Field Situation with the Largest Difference Area
Source: Processed by Researchers in April 2020

Based on Figure 2 and Figure 3, it can be seen that the fields and numbers in blue colour are the results of measurements using RTK SMART TB5 receiver with RTK-NTRIP method, while the red ones use CHCNav i50 receiver with the static method. Field situations that appear to be different are the weather factor, measurement time and the position of roads and buildings. This is a dynamic that occurs in the field that affects the accuracy of a position.

3. CONCLUSION

Based on the results of research and analysis that has been done, the following conclusions can be drawn:

- The results of the t test at the 5% significance level, there is a significant difference between the coordinates of the RTK SMART TB5 and the static coordinates in the range of 0-5 km, 5-10 km and 10-15 km from the CORS base station of the Land Office of Sleman Regency;
- The value of standard deviation and the average lateral difference between RTK SMART TB5 and static is getting bigger along with the increasing range of distance from the base station of the Land Office of Sleman Regency CORS which indicates a decrease in position accuracy, but it still below the required tolerance;
- The results of the calculation of the difference in side length and the calculation of the area of the land parcel of the RTK SMART TB5 coordinates to the static coordinates, the entire length of the side and the area of the land parcel, 100% meet the tolerance according to PMNA/KBPN Technical Guidelines Number 3 of 1997 for agricultural land;
- The results of the calculation of the lateral difference between the RTK SMART TB5 coordinates to the static coordinates are in the centimeter fraction and 100% meet the tolerance according to PMNA/KBPN Technical Guidelines Number 3 of 1997 for agricultural land, namely 0.250 m.

REFERENCES

Abdullah, R. , Suharno, dan Wahyuni 2018, 'Evaluasi Pemanfaatan Aplikasi Smart PTSL dalam Pembuatan Peta Kerja Pndaftaran Tanah Sistematis Lengkap', *Prosiding Seminar Nasional Geomatika 2018*, Yogyakarta.

National Standardization Agency 2002, *Standar Nasional Indonesia: Jaring Kontrol Horizontal*, Jakarta.

Bramanto, B ,Gumilar, I, Sidiq,TP, Abidin, HZ, Hermawan, MDA, dan Wijayanto, BM 2016, 'On the Performance of a Single-Frequency Low-Cost GPS', *Prosiding Seminar Nasional 3rd CGISE dan FIT ISI 2016*, Yogyakarta.

Hariyoko 2008, 'Pemanfaatan Receiver Global Positioning System single Frequency Spectra Epoch 10 Metode Rapid Static untuk Pengukuran Titik Dasar Teknik Orde 4', Skripsi pada Program Diploma IV Pertanahan, Sekolah Tinggi Pertanahan Nasional.

Odolinski, R, and Teunissen, PJ 2017, 'Low-Cost, High-Precision, Single-Frequency GPS-BDS RTK Positioning', *GPS Solutions* 21 (3), hlm. 1315-1330, dilihat tanggal 5 Mei 2020, https://espace.curtin.edu.au/handle/20.500.11937/543.

Pradhana, A. B. B. 2012, 'Perbandingan Hasil Ukuran antara Receiver GNSS RTK dengan Receiver GNSS Metode RTK-NTRIP (Studi di Kabupaten Bantul, Provinsi Daerah Istimewa Yogyakarta)', Skripsi pada Sekolah Tinggi Pertanahan Nasional.

Ramadhon, Syafril 2015, ‘Analisis Pengaruh Total Electron Content (TEC) di Lapisan Ionosfer pada Data Pengamatan GNSS RT-PPP’, *Swara Patra*, Volume 5 No.1, diposting pada 31 Desember 2015, dilihat pada 02 Mei 2020.

Safi'i, A. N. & Aditya, A. 2017. 'Akurasi Pengukuran GPS Metode RTK-NTRIP Menggunakan INA-CORS BIG', Prosiding Seminar Nasional Geomatika 2017, dilihat pada 4 Februari 2020, http://semnas.big.go.id/index.php/SN/article/view/441/.

Surakhman, A 2017, 'Komparasi Kualitas Hasil Pengukuran Antara Receiver GNSS Low Cost BAP Precision S852 dan Receiver GNSS Geodetik Leica GS08 dalam Variasi Kondisi di Lapangan', Skripsi pada Fakultas Teknik, Universitas Gadjah Mada.

BIOGRAPHICAL NOTES

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