Projection of Geospatial Human Resources in Indonesia Until 2025

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INTRODUCTION

- Research Objectives are
  (1) to capture the existing situation of geospatial information manpower in Indonesia, their distribution, competence type and competence level;
  (2) to make prediction about need of geospatial information manpower in the next 10 years.
- The result of prediction could give a benchmark for the education sector, how to fulfill the manpower gap and which competence type and level which they should have

MATERIAL & METHOD

- uses self estimation in form of questionnaire
- The respondents should select which competence indicator they have. The indicators are taken from the standard of working competence. From the answers, we can conclude which competence's type and competence's level the respondent has.

MATERIAL & METHOD

- There are 6 competence types, i.e. Terrestrial Surveying, Hydrography, Photogrammetry, Remote Sensing, GIS and Cartography The competence level is divided in 9 levels, but in this research, only level 3 to level 9 will be practically effective.
- The research used stratified- & purposive random-sampling in nearly all provinces in Indonesia and the questionnaires are filled by hundreds respondent. The cities of respondents are classified using its population density.

MATERIAL & METHOD

For the simulation the need and demand of GI-manpower in the future, we can assume that the population growth according the Central Statistics Agency is 1.9%, the domestic economic growth is 3%, the impact of regional free trade area is about -1% and the impact of technological efficiency is also -1%.

RESULTS & DISCUSSION

Table 3-1 Distribution of GI manpower according education level and workplaces.

No.	Workplaces	Educational Level			
		VHS	Vocational	Bachelor	Post Graduates
1	Central Government Offices	1.872	-	1.144	67
2	Cities / Municipalities Offices	79	237	948	316
3	States Own Enterprises	60	-	319	20
4	Mining Industries	17	11	84	0
5	Agro-Forestry Industries	26	5	71	0
6	Real Estate Industries	21	14	106	0
7	Geospatial Information Industries	1.712	86	999	57
8	Cities Consultant Offices	22	15	175	7
9	NGO	9	14	56	14
Total (8.584)		**3.817**	**382**	**3.903**	**481**

RESULTS & DISCUSSION

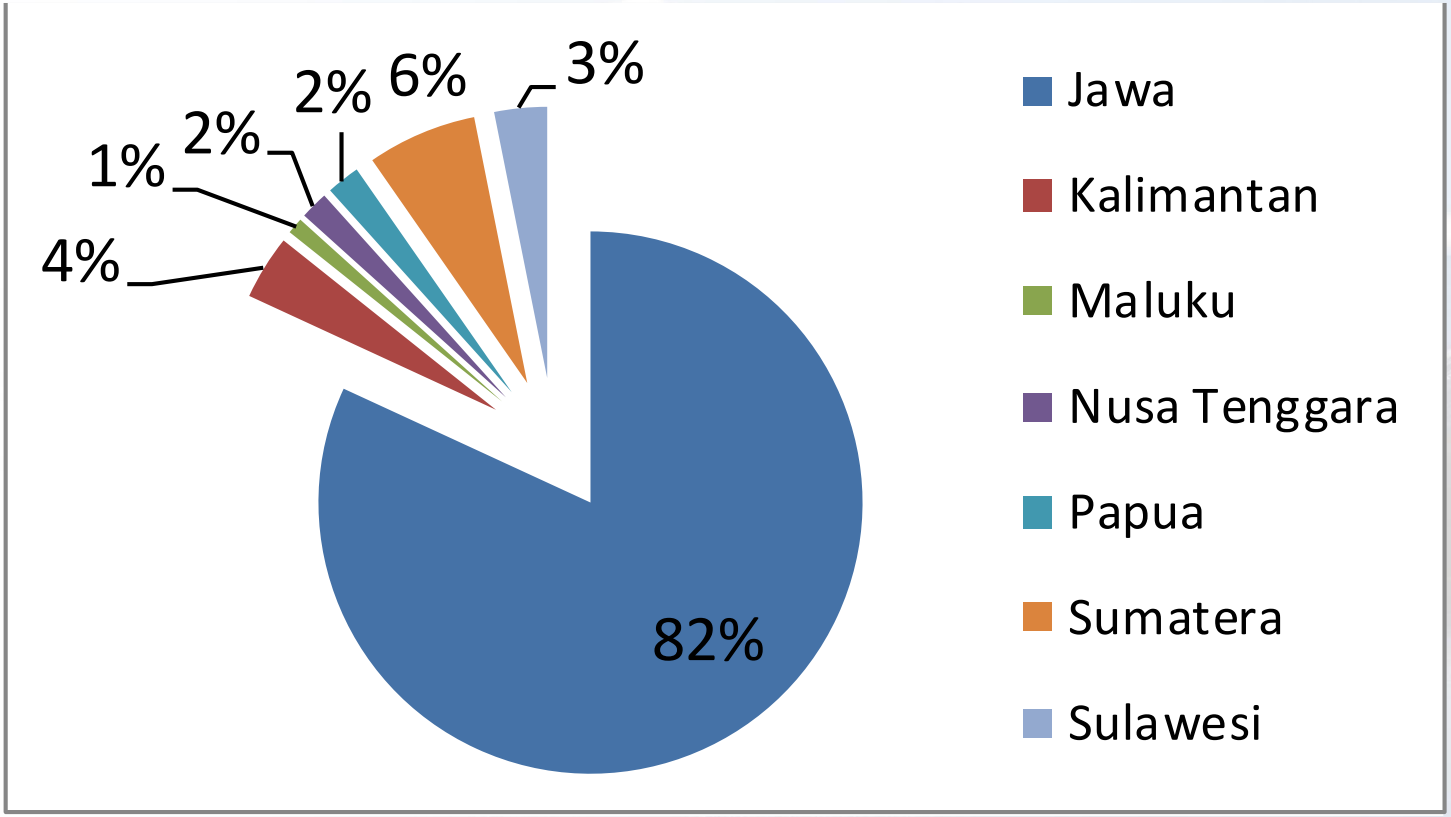

Fig 3-1 Procentages of GI-manpower availability in big islands

RESULTS & DISCUSSION

According to working field, big number the existing GI manpower in Indonesia are working in surveys & mapping (41%), followed by research and development (16%), spatial planning (13%) and land cadaster (12%).

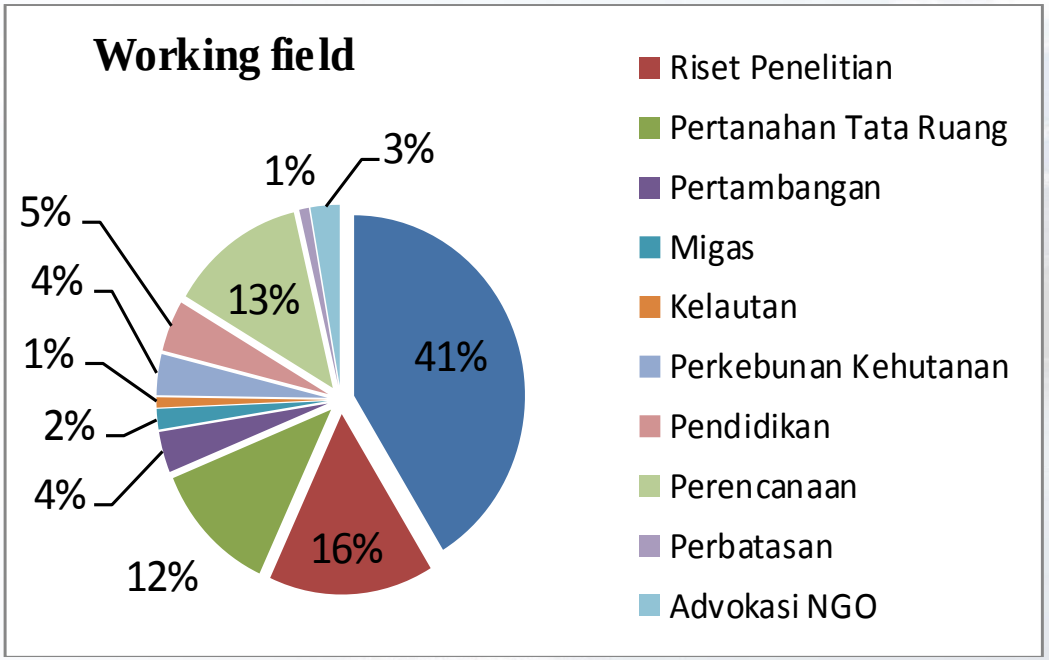

Fig 3-2 Procentages of GI-manpower in working fields

RESULTS & DISCUSSION

Table 3-3 Profile of respondent according competence type and competence level

Competence Level	Operator	Analyst			Expert		
	3	**4**	**5**	**6**	**7**	**8**	**9**
Terrestrial Surveying	6	2	7	10			
Hydrography	1	1	3	3	4	11	
Photogrammetry	1	3		3	1	1	
Remote Sensing	0	0	0	4	3	7	
GIS	13			10	1	2	4
Cartography	5			2	2		

RESULTS & DISCUSSION

Table-3-4 Result of Geospatial Information Manpower Simulation

Year	Need Projection	Manpower availability	Manpower gap	Manpower fulfillment	Fulfillment plan
2015	31,500	8,584	22,917		22,917
2016	32,414	11,084	23,830	2,500	21,330
2017	33,353	13,584	22,270	2,500	19,770
2018	34,321	16,084	20,737	2,500	18,237
2019	35,316	18,584	19,233	2,500	16,733
2020	36,340	21,084	17,757	2,500	15,257
2021	37,394	23,584	16,311	2,500	13,811
2022	38,479	26,084	14,895	2,500	12,395
2023	39,594	28,584	13,511	2,500	11,011
2024	40,743	31,084	12,159	2,500	9,659

RESULTS & DISCUSSION

Table 3-5 Projection of National Demand of Geospatial Information Manpower

Year	Terrestr		Hydrogr		Photogr		RemSens		GIS		Carto	
	VHS	BSc	VHS	BSc	VHS	BSc	VHS	BSc	VHS	BSc	VHS	BSc
2015	5,322	2,281	123	288	2,622	1,748	657	986	2,745	4,118	1,014	1,014
2016	4,953	2,123	115	268	2,440	1,627	612	918	2,555	3,833	943	943
2017	4,591	1,968	106	248	2,262	1,508	567	851	2,368	3,552	874	874
2018	4,235	1,815	98	229	2,086	1,391	523	785	2,185	3,277	807	807
2019	3,886	1,665	90	210	1,914	1,276	480	720	2,004	3,006	740	740
2020	3,543	1,518	82	192	1,745	1,164	438	657	1,828	2,741	675	675
2021	3,207	1,374	74	173	1,580	1,053	396	594	1,654	2,481	611	611
2022	2,878	1,234	67	156	1,418	945	356	533	1,485	2,227	548	548
2023	2,557	1,096	59	138	1,260	840	316	474	1,319	1,978	487	487
2024	2,243	961	52	121	1,105	737	277	416	1,157	1,736	427	427

Annotation: TERRESTR (Terrestrial Survey), HYDROGR (Hydrography), FOTOGR (Photogrammetry), REMSENS (Remote Sensing), GIS (Geographical Information System), CARTO (Cartography & Spatial Multimedia), VHS = Vocational High School, BSc = University's Bachelor degree.

CONCLUSION

The surveys give accurate information about distribution of geospatial human resources and industries in some aspects: expertise field, expertise level and location.

Some expertise fields such as photogrammetry and GIS software development, still need high number of human resources.

However, industries in this expertise have also good competitive advantages in global market,