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Functional Shifting From Agricultural Land Into Non-Agriculture

I Ketut Arnawa[1]✉, Nenette Tolentino Columna[2] and Dian Tariningsih[1]
[1]Faculty of Agriculture and Business, Mahasaraswati University Denpasar
[2]Cagayan State University, Philippines
✉Correspondence Email: arnawaiketut1962@gmail.com

Abstract

The main problem in this research was the conversion of agricultural land into non-agricultural land in the regional spatial plan. The occurrence of agricultural land shifting involved the government, land owners, investors and the community. The aims of this research was to analyze factors, economic, social, land conditions and the government as the reason of the conversion of agricultural land into non-agriculture. The research was conducted in Denbantas Village, Tabanan Regency, Bali, with the consideration that the village was shifting the function of agricultural land. The research sample was determined by proportional random sampling with total 148 respondents. The data were analyzed quantitatively and qualitatively, the research results found that the dominant factors of agricultural land shifting were the need for housing, public ignorance of the land function, there was no land as an alternative to build a residence, and the government lacked socialization about land functions according to the regional spatial plan. The research on the causes of conversion of agricultural land into non-agricultural need to be conducted to anticipate land conversion did not occur sustainably.

INTRODUCTION

The data from the Tabanan Agriculture Agency in 2019 showed that from 2011 to 2019, there was a reduction in rice fields of 149.56 hectares, followed by an increase in non-rice fields of 119.89 hectares and non-agriculture land of 29.67 hectares. Denbantas Village was located in Tabanan Regency which was a buffer line for the Tabanan urban area. The projected population of Denbantas Village in 2034 is 10,141 people; the growth of built-up land such as settlements to accommodate population growth resulted in the conversion of agricultural land. In 2015, Denbantas Village had the largest land area among villages in the urban area of Tabanan, which was 400.62 Ha with details; agricultural land area of 195.92 Ha, plantations 99.06 Ha and settlements 105.64. The land usage continued to grow which tended to increase towards built-up land that used for housing and settlements and automatically reduced the area of agricultural land, this phenomenon had occurred since 2015.

Pramudiana's research, (2018) found that, functional shifting of land or commonly referred to land conversion was a change in the function of part or all of the land area from its original function (as planned) to other functions that were a problem for the environment and the potential of the land itself. Land functional shifting was defined as a process of change from previous land usage to other usages which can be permanent or temporary and was a logical consequence of the growth and transformation of changes in the community's socio-economic structure that properly developed for both commercial and industrial purposes. If the land usage for rice fields was changed to residential or industrial, the change in land usage was permanent and irreversible, but if it was converted to plantations, it was usually temporary. Research by Siregar, Tarsilohadi and Oktaviana, (2021) revealed that more than 50 percent of provinces in Indonesia, including Bali, still relied on the agricultural sector, thus the conversion of agricultural land must be stopped.

Fattah and Purnomo's research (2018), land conversion for non-agricultural activities such as industrial and housing development due to the lack of control and supervision by the government. Septiani's research, (2019) land functional shifting was caused by the number of family dependents and the size of the farmer's land. This research analyzed the involvement of the government as the authority for spatial planning and building permits, land owners who control agricultural land management, land conditions, which were land productivity and the average area of land ownership, then the investors as housing developers in Puri Ganesha, Permata Hijau and Triyana Villa, as the cause of the conversion of agricultural land into non-agricultural land. The causes of land functional shifting need to be investigated, so that the conversion of agricultural land can be stopped. This research had the objectives of analyzing (1) economic factors as the cause of the agricultural land conversion, (2) social factors as the cause of the agricultural land conversion, (3) the

land condition as the cause of land conversion, and (4) the government role as the cause of the agricultural land conversion.

RESEARCH METHOD

There has been a deviation of existing or factual built up land in the Tabanan Regency Spatial Plan. The deviation of built-up land that occurred was mainly the conversion of agricultural land into non-agricultural land. The occurrence of functional shifting of agricultural land into non-agricultural was closely related to the government role, land owners, investors and the community besides economic factor, social and agricultural land conditions, then analyzed the dominant factors that caused the conversion of agricultural land, thus a policy can be formulated to stop the conversion of the agricultural land, graphically shown in Picture 1.
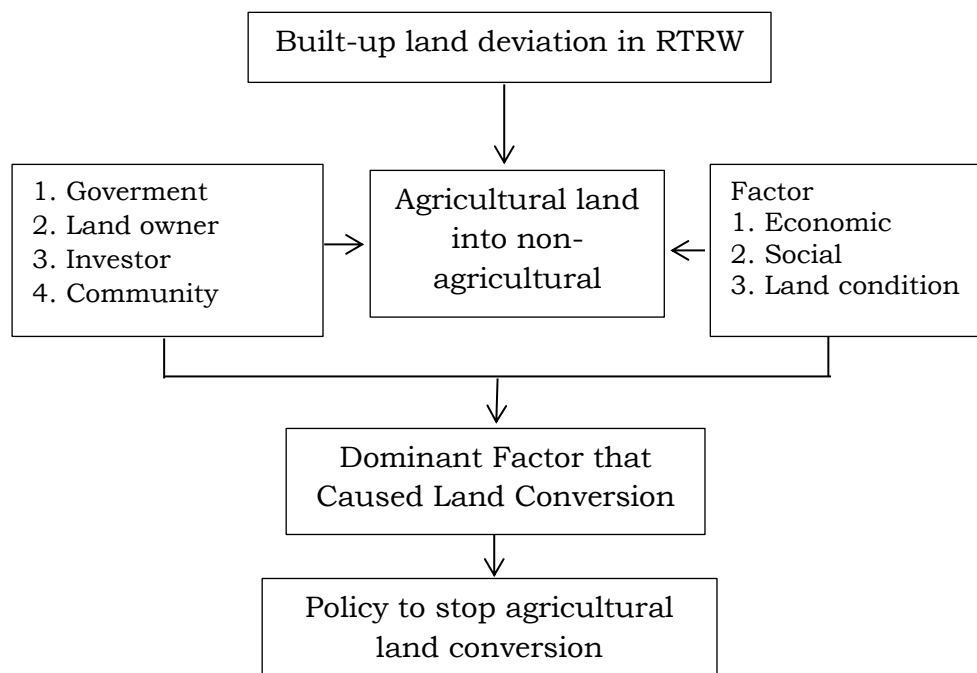
Picture 1. Research Framework

The research was conducted in Denbantas Village, Tabanan Sub-district, Tabanan Regency, Bali. The research population was the management actors of agricultural land conversion in 2020, such as, the government, land owners, investors, and the community. The research sample was taken by proportional random sampling of 142 people, the government 15 respondents, land owners 8 respondents, investors 3 respondents, and the community 122 respondents

The data collected by using questionnaires and in-depth interviews. The data were analyzed descriptively, quantitatively and qualitatively, the analysis of objectives (1) economic factors used five questions, E1 family dependents, E2 insufficient income, E3 demands for housing, E4 large agricultural capital and E5 incentives for farmers, analysis of objectives (2) social factors used six questions, S1 modern lifestyle, S2 tradition of mutual cooperation which was starting to fade, S3 loss of cultural values of rural communities in agricultural land management, S4 there was no young successor that worked in the agricultural sector, S5 ignorance

of land functions in regional spatial planning and S6 investor pressure, analysis of objectives (3) land condition factors used five questions, such as K1 land location, K2 land area, K3 land productivity, K4 land prices, K5 land ownership, analysis of objectives (4) government factors used five questions, P1 was a government regulation or commitment in the land management and agricultural products, P2 socialization of regional spatial plans, P3 controlling the conversion of agricultural land into non-agricultural, P4 simplicity in business permit and P5 high taxes.

RESULT AND DISCUSSION
Economic Factor that Caused Agricultural Land Conversion
  The economic factor that caused the agricultural land conversion, the lowest was E5 farmer incentives, which was 5.41%, this showed that giving incentives to farmers can save agricultural land, so far farmers have received incentives for fertilizer price subsidies, in the future it was expected that incentives benefits can be felt immediately, such as subsidizing the selling price of agricultural products. The total choices percentage of land conversion actors on economic factors was presented in Table 1.

Table 1. Economic factor that caused the land conversion in Denbatas Village in the Year 2020

The Management of Agricultural Land Conversion	Economic Factor					Total
	E1	E2	E3	E4	E5	
Goverment	3	2	8	2	0	15
Investor	0	0	3	0	0	3
Land Owner	1	2	1	2	2	8
Community	20	22	59	15	6	122
Total	24	26	71	19	8	148
Percentage (%)	16,22	17,57	47,97	12,84	5,41	100,00

Source: Primary data analysis, 2020

  The dominant economic factor that caused the conversion of agricultural land was E3 the demand for housing (houses) with the domination of choice of 47.97%. This was reinforced by the research results by Nurul Hidayati and A. Kinseng, (2015) that the dominant economic factor that affected the occurrence of land conversion was the urgent need for housing. The second reason was insufficient income E2 from agricultural products, which was 17.57%, this strengthens the results of Dinaryanti's research, (2014) found that income received from agricultural products was not sufficient for needs and as the dominant factor, thus encouraging land conversion. Strengthening the research of Ye et al., (2014) in the Yellow River Delta, Vietnam, land conversion continued throughout the year because the economic activity of the community was increasing.

  The need for housing was caused by the increasing number of family members. Therefore it required a wider living space. This was in line with the traditional Balinese housing system, which generally still had group residences with large families, so that if the number of family members increases, it required a wider living space, so that some family members tended to look for land to live outside the

residence of the extended family. Besides the location of the workplace, people tended to have a place to live close to the work location, so that it had an impact on the functional usage of agricultural land.

Social factor that caused agricultural land conversion

The lowest social factor that caused the agricultural land conversion was S6 investor pressure, which was 5.41%, means that investors did not have enough power to pressure land owners to convert agricultural land. Furthermore, as the second caused of land functional shifting was a modern lifestyle S1, of 16.89% and there was no next generation of young people worked in the agricultural sector 15.54%. The modern lifestyle of the community made people not interested in working in the agricultural sector, the work situation was not comfortable to wrestle with mud, there was no decent income guarantee for their families, so that the younger generation as the successors in farming were more interested in working in the tourism sector or other sectors, which were more promising for the future. The social factors that caused the agricultural land conversion were presented in Table 2.

Table 2. Social factor that caused the land conversion in Denbatas Village in the year 2020

The Management of Agricultural Land Conversion	Social Factor						Total
	S1	S2	S3	S4	S5	S6	
Goverment	3	2	2	8	1	4	15
Investor	0	0	0	0	3	0	3
Land Owner	2	1	1	1	2	1	8
Community	20	15	14	14	56	3	122
Total	25	18	17	23	62	8	148
Percentage (%)	16,89	12,16	11,49	15,54	41,89	5,41	100,00

Source: Primary data analysis, 2020

The dominant social factor that caused the agricultural land conversion was S5, the community ignorance about the regional spatial plan with the dominance choice of 41.89%. This strengthens the research results by Khaerani, Sitorus and Rusdiana, (2018) which found that the level of community knowledge about regional spatial planning was one of the factors that caused land usage inconsistencies. This was due to the lack of a policy holder approach as a mediator to disseminate the land function policy, so that the community fulfilled their housing needs by building or buying land that was not designated for settlement. Research by Lia, Satmoko and Prayoga, (2021) a development program had a beneficial social impact for the community such as ease in accessing daily needs.

Land condition factor that caused agricultural land conversion

The K3 land productivity as the lowest caused of agricultural land conversion, with a choice of only 10.81%. Land productivity, especially rice, was relatively high, which was 6-8 tons/ha, with an adequate irrigation network system, and after the land functions shifting there were several damaged irrigation channels and garbage

began to pile up. This was supported by the research results by Ustriyana et al., (2021) that land conversion had an impact on the destruction of several irrigation channels, sustainable agricultural systems must be supported by strong irrigation system management. Land productivity was not the main cause of agricultural land conversion. The price of K4 land, 16.22% was the second cause of land conversion, the price of paddy fields in Denbantas Village was quite high, 70-80 million Rupiah/are, when compared to the price of paddy fields elsewhere in Tabanan Regency which only reached 30 million Rupiah/are. This was being one of the attractions of land owners to shift the function of agricultural land.

The choices percentage of agricultural land conversion actors to the land condition factors was presented in Table 3. The dominant land condition factor as the reason of agricultural land conversion was K5 land ownership with a dominant choice of 44.59%. This was in line with Affan's research (2014) which found that shifting in land usage for settlements and industry mostly occurred and decreased the area of agricultural land because land was the only asset for building houses or industries. Furthermore, research by He, Huang and Wang, (2014) in North China over the last 50 years, there was a conversion of forest and grassland into agricultural land to increase land productivity. Furthermore, Abdullah and Nakagoshi, (2007) research in Selangor Malaysia, to increase land productivity was conducted by converting forest land into oil palm plantations. Purwanto and Hindrayani's research, (2020) that the conversion of forest land into intensive agricultural land had an impact on the efficiency in using nitrogen fertilizers.

Table 3. Land condition factor that caused the land conversion in Denbatas Village in the Year 2020

The Management of Agricultural Land Conversion	Land Condition					Total
	K1	K2	K3	K4	K5	
Government	1	2	2	3	7	15
Investor	0	1	0	0	2	3
Land Owner	1	1	1	2	3	8
Community	19	17	13	19	54	122
Total	21	21	16	24	66	148
Percentage (%)	14,19	14,19	10,81	16,22	44,59	100,00

Source: Primary data analysis, 2020

The land conversion due to housing needs, because the land was the only asset owned by the community. In addition, there was housing built by investors. Investors who bought and controlled agricultural land built housing, and the demand for tourism facilities had an impact on the growth of uncontrolled housing and many productive agricultural lands controlled by investors were left as idle land, this supported the research of Wardi et al., (2016) that land conversion as an impact of population growth that need housing.

Government factor as the caused of agricultural land conversion

The government factor that played a dominant role in the agricultural functions conversion was P2 socialization of the regional spatial plan which was lack with the

dominance of 41.89% choice. Strengthening the research of Khaerani, Sitorus and Rusdiana, (2018) which found that the low level of public knowledge about regional spatial planning was caused by lack of socialization by the government, this had been realized by the Regional Government of Tabanan Regency through the Spatial Planning Department as the holder of spatial policy. Due to the vast area of Tabanan Regency with 133 villages and the lack of funds and technical staff, there was very little socialization and so far it had only reached the Sub-district level. The choice percentage of the actors in the agricultural land conversion to the government factor variables was presented in Table 4.

Table 4 Government factor that caused land conversion in Denbatas Village in the year 2020

The Management of Agricultural Land Conversion	Government Factor					Total
	P1	**P2**	**P3**	**P4**	**P5**	
Government	1	1	1	2	10	15
Investor	1	0	1	1	0	3
Land owner	1	2	1	1	3	8
Community	24	59	11	12	16	122
Total	27	62	14	16	29	148
Percentage	18,22	41,89	9,46	10,81	19,59	100,00

Source: Primary data analysis, 2020

The P5 land tax was the second cause of the agricultural land conversion, 19.59%, therefore the government in order to save agricultural land, can take a policy of providing tax subsidies or exempting agricultural land taxes (rice fields), such as some districts in Bali exempting farmers' rice taxes, taxes were paid by the Regency government. Furthermore, P1 the government's commitment to the land management and agricultural production was still low, 18.22%. The government can take a policy that was hard to give permits to build buildings to investors and imposed strict sanctions on violations of land functions that were not in accordance with the regional spatial plan.

CONCLUSION

The dominant factors that caused the agricultural land conversion were housing needs, insufficient income from the agricultural sector, public ignorance of land functions in regional spatial planning, modern lifestyles, agriculture sector was less attractive to the younger generation, agricultural land was the only asset for building housing, lack of socialization about regional spatial plans to the community, government commitment to agricultural land was still low. Policies that can be taken by the government were providing incentives to farmers who own land, exemption from rice fields tax, it was hard to give permits to build buildings on land that was not in accordance with the regional spatial plan, land functional shifting that did not have a permit were subject to sanctions according to applicable regulations to stop sustainably land functional shifting.

RECOMMENDATION

The research about agricultural land conversion was still limited, so this research still needs to be continued in a wider scope, to analyze the existing land conditions, with the digitization process using the ArcGIS application, it can be discussed in more detail and itemized the area of agricultural land conversion.

ACKNOWLEDGEMENT

DAFTAR PUSTAKA

Abdullah, S. A. and Nakagoshi, N. (2007) 'Forest fragmentation and its correlation to human land use change in the state of Selangor, peninsular Malaysia', *Forest Ecology and Management*, 241(1–3), pp. 39–48. doi: 10.1016/j.foreco.2006.12.016.

Affan, F. M. (2014) 'Analisis Perubahan Penggunaan Lahan Untuk Permukiman dan Industri Dengan Menggunakan Sistem Informasi Geografis (SIG)', *Jurnal Ilmiah Pendidikan Geografi*, 2(1), pp. 49–60.

Dinaryanti, N. (2014) 'Faktor-Faktor yang Mempengaruhi Alih Fungsi Lahan Pertanian di Daerah Sepanjang Irigasi Bendung Colo Kabupaten Sukoharjo', *Undergraduate thesis, Fakultas Ekonomika dan Bisnis. Universitas Diponegoro*, pp. 1–73.

Fattah, A. N. and Purnomo, E. P. (2018) 'Analisis Kebijakan Alih Fungsi Lahan Pertanian Ke Non – Pertanian Di Kabupaten Klaten Tahun 2013-2016 (Studi Kasus Kecamatan Ceper Kabupaten Klaten)', *Jispo (Jurnal Ilmu Sosial dan Ilmu Politik)*, 8(1), pp. 113–140.

He, C., Huang, Z. and Wang, R. (2014) 'Land use change and economic growth in urban China: A structural equation analysis', *Urban Studies*, 51(13), pp. 2880–2898. doi: 10.1177/0042098013513649.

Khaerani, R., Sitorus, S. R. P. and Rusdiana, O. (2018) 'Analisis Penyimpangan Penggunaan Lahan Berdasarkan Rencana Tata Ruang Wilayah Kabupaten Sumedang', *Tataloka*, 20(4), p. 399. doi: 10.14710/tataloka.20.4.399-409.

Lia, R. S., Satmoko, S. and Prayoga, K. (2021) 'Socio-Economic Impact of Agropolitan Area Development Among Chrysanthemum Farmer', *SOCA: Jurnal Sosial Ekonomi Pertanian*, 15(3), pp. 505–517.

Nurul Hidayati, H. and A. Kinseng, R. (2015) 'Konversi Lahan Pertanian Dan Sikap Petani Di Desa Cihideung Ilir Kabupaten Bogor', *Sodality: Jurnal Sosiologi Pedesaan*, 1(3), pp. 222–230. doi: 10.22500/sodality.v1i3.9405.

Pramudiana, I. D. (2018) 'Dampak Konversi Lahan Petanian Terhadap Kondisi Sosial Ekonomi Petani Di Kecamatan Tikung Kabupaten Lamongan', *Asketik*, 1(2), pp. 129–136. doi: 10.30762/ask.v1i2.525.

Purwanto and Hindrayani, A. (2020) 'The impact of forest land use change to intensive agricultural system on the economic efficiency of nitrogen utilization', *IOP Conference Series: Earth and Environmental Science*, 485(1), pp. 0–9. doi:

10.1088/1755-1315/485/1/012064.

Septiani, R. (2019) 'Dampak Konversi Lahan Pertanian Menjadi Lahan Perkebunan Desa Arasoe Bone', *Jurnal Kajian Sosial dan Budaya: Tebar …*, 3(3), pp. 92–100. Available at: http://ejournal.tebarscience.com/index.php/JKSB/article/view/59.

Siregar, A. P., Tarsilohadi, E. R. and Oktaviana, N. (2021) 'griculture, Forestry and Fisheries The Transformation of ASectors in the Indonesian Economy', *SOCA: Jurnal Sosial Ekonomi Pertanian*, 15(3), pp. 564–575.

Ustriyana, I. N. G., Budiasa, W., Widhianthini, & Punia, I. N. (2021). The Sustainability Prospective of Irrigation System Management In Bali and Outside of Bali. SOCA: Jurnal Sosial Ekonomi Pertanian, 15(3), 622–640. https://doi.org/https://doi.org/10.24843/SOCA.2021.v15.i03.p18.

Wardi, I. N., Laksmiwati, I. A. A., Gunadi, I. G. A., & As-syakur, A. R. (2016). Dampak Pertumbuhan Penduduk Terhadap Lingkungan Dan Budaya Subak : Studi Kasus Di Kabupaten Tabanan Provinsi Bali. Bumi Lestari, 14(2), 110–124. https://doi.org/10.24843/blje.

Ye, Q., Liu, G., Tian, G., Chen, S., Huang, C., Chen, S., … Shi, Y. (2004). Geospatial-temporal analysis of land-use changes in the Yellow River Delta during the last 40 years. Science in China, Series D: Earth Sciences, 47(11), 1008–1024. https://doi.org/10.1360/03yd0151.

Zahrotunisa, S. (2017) 'Prediksi Spasial Perkembangan Lahan Terbangun Melalui Pemanfaatan Citra Landsat Multitemporal di Kota Bogor', *Jurnal Online Informatika*, 2(1), p. 30. doi: 10.15575/join.v2i1.88.