

Article history:

Submitted: February 22nd, 2022

Revised : May 19th, 2022

May 5th, 2022

Accepted : August 24th, 2022

Meriko Dian Candra Iwana¹, AR. Rohman Taufiq Hidayat^{1,*}, Dian
Dinanti¹, Kenichiro Onitsuka²

¹ Regional and Urban Planning Department, Universitas Brawijaya,
Malang, Indonesia

² Laboratory of Sustainable Rural Development, Graduate School of
Global Environmental Studies, Kyoto University, Kyoto, Japan

*) Correspondence email: a.r.taufiq.h@ub.ac.id

The Effects of Internet on Rural-to-Urban Migrating Intentions of Young Villagers: Evidence from Rural Indonesia

DOI: <https://doi.org/10.18196/agraris.v8i2.14045>

ABSTRACT

Indonesian's government attempts to build internet infrastructure covering all rural areas of which most internet users are young. Youths refer to a generation who intuitively able to operate internet device and are supposed to take an important decision about their future careers, occupations, and living places. This study aimed to identify effects of internet on rural-to-urban migrating intentions of rural youths. The Structural Equation Model-Partial Least Square (SEM-PLS) approach was applied. This study involved 866 of 15 to 24 years villagers of Tumpukrenteng Village, Malang Regency. This village reflects an ordinary village which is characterized high rural-to-urban migration. A randomized of 213 respondents were taken but 193 respondents were analyzed due to internet users. The independent variables covered internet infrastructure, internet usage, collecting information on prospective destination activity, and the dependent variable covered migrating intention. The results demonstrated that internet accelerated young villagers' rural migrating intention. Internet allowed their users to access information of prospective destination. This research suggested young villagers to apply internet into economic benefits activity, such as e-commerce and to reduce adverse impacts of internet usage and rural youth's emigration.

Keywords: Internet; Migrating intention; Rural; Young villagers

INTRODUCTION

Internet penetration is increasing enormously in developing countries and closing the gap between developed countries (International Telecommunication Union, 2021). An improved internet connection allows government and its user benefits more and reduces rural disadvantages, such as improving information flow to compensate for remoteness (Forman, Goldfarb, & Greenstein, 2005) and broadening the market network of agricultural production (Galtier, David-Benz, Subervie, & Egg, 2014). Indonesia is one of the developing countries that commit to provide Internet for all citizens. The internet infrastructure development, commencing in 1980, has allowed more than half of Indonesia's population (about 132.7 million) to access the internet (Hardono, 1988; Indonesian Internet Service Provider Association (APJII), 2016). Internet penetration reached 73.7% in 2019, and 95.4%

of them utilize smartphones to support growing internet penetration (Indonesian Internet Service Provider Association, 2020). The Ministry of Communication and Informatics of Indonesia has attempted to boost national connectivity through the 2014-2019 Indonesia Broadband Plan. The main target of this program is to build internet infrastructure to reach 100% of the urban population and 52% of the rural population in Indonesia (Ministry of Telecommunication and Information Technology, 2015) and the target was achieved successfully in 2018 (Indonesian Internet Service Provider Association, 2018). The program will continuously develop to serve many rural areas with internet connectivity. The government intends to pursue this plan seriously due to effect of internet on various aspects of human life. The internet offers communication and interaction alternatives, economic benefits, and disaster risk reduction (Bargh & McKenna, 2004; Kraut & Kiesler, 2003; Rini & Rahadiantino, 2020; Yulianto, Utari, & Satyawan, 2020).

Internet penetration increases annually. Among internet users, the young people have the highest share of other age groups and are considered digital natives (Indonesian Internet Service Provider Association, 2018, 2020). Digital natives refer to a generation born after 1980 when access to technology was relatively easy and digital social networking was already available (Palfrey & Gasser, 2008). Moreover, digital natives intuitively can operate information and communication technology and internet without manual instructions. They are in a transitional period from childhood to adulthood, a period of dependence toward independence and interdependence (Global Migration Group, 2014). This period marks a stage in which most people must make big decisions in their lives, including the decision to live (work and reside) in their origin or other areas.

The dynamic population of developed and developing countries, including Indonesia, is currently facing similar demographic issues, that is the declining rural population. Statistics Indonesia (2020) projected rural population will decline to 33.4% of the total of Indonesian residents in 2035. The declining rural population is also inline to the declining number of agricultural households (Ministry of Agriculture, 2014; Statistics Indonesia, 2013, 2018). Concerning to urbanizing rural area due to development and classification, rural emigration is predicted to contribute declining of rural population of Indonesia (Pardede, McCann, & Venhorst, 2020; Wilonoyudho, Rijanta, Keban, & Setiawan, 2017). This situation indicates that rural areas will be increasingly deprived of human resources and find more challenging conditions to realize the vision of sustainable village development and food security.

The sustainable rural livelihoods framework of Carney *et al.* (1999) proposes five necessary capital assets to accomplish sustainable village development and food security. They are social, human, financial, physical, and natural capital. Human capital is deemed to be the backbone of the other approach. A person reflects human capital and is considered the only asset that can own the five capital assets. Therefore, rural-urban migration can deplete the five capital assets, especially human resources living off the agricultural land and residing in rural areas (Muta'ali, 2013) . However, disadvantage of village conditions (i.e., limited economic opportunity and public services) encourage villagers to emigrate to other areas that offer better conditions to secure livelihoods (Hidayat, Onitsuka, Sianipar, & Hoshino, 2022; Nguyen,

Raabe, & Grote, 2015). Urban areas offer villagers' needs (i.e., job opportunity) and eventually attracts villagers to move in (Lyu, Dong, Roobavannan, Kandasamy, & Pande, 2019).

Nowadays, internet penetration in rural areas is increasing (Indonesian Internet Service Provider Association, 2018, 2020) and offers alternative communication methods (Bargh & McKenna, 2004; Kraut & Kiesler, 2003). The internet resolves communication barriers that will affect migration (Lee, 1966). Information source is essential in forming migration intention of rural youth (Hidayat et al., 2022). However, a study indicated that effect of information depends on the distance between rural and urban. Further, the other study showed that young villagers who are active as internet users have less intention to stay in village. The prospective migrants commonly use internet to communicate with their social networks who live in a prospective destination (Dekker & Engbersen, 2014; Dekker, Engbersen, & Faber, 2016; Hidayati, 2017; Priatama, Onitsuka, Rustiadi, & Hoshino, 2020). This study aimed to investigate the effects of internet usage on rural youth's migrating intentions. This youth's migration holds up rural development due to less of superior human resources of young villagers. This research is beneficial to predict the acceleration of young villagers' migration and to formulate a prevention policy. Internet has an essential role to accelerate migration process by providing access to information that is beneficial in migrating preparation and decision (Kotyrla, 2020; Thulin & Vilhelmson, 2014). Since evidence of internet impacts on migration intention in Indonesia is fragmented, this study is the first research directly investigating the effect of internet on early migration stage.

RESEARCH METHOD

This study was conducted in Tumpukrenteng Village, Turen District, Malang Regency, East Java as shown in Figure 1. The population of this village was 5,256 villagers (BPS-Statistics of Malang Regency, 2021). Most of land in this village is used for agriculture, and most people work as smallholder farmers. The BPS-Statistics of Malang Regency (2016) reports that 1,331 residents left Turen District, and it predicts that the leaving will not stop in forthcoming years (Kustanto & Sholihah, 2020). Turen was the fourth most populous district after Singosari, Kepanjen, and Pakis and had the most extensive arable land of 2,434 Ha. Onitsuka, Hidayat, & Huang (2018), discovered that young residents of Tumpukrenteng Village plan to live or work outside their village. Internet access, broadband, and Wi-Fi hotspot were available in Tumpukrenteng Village. Those allow users to access internet easily and obtain information regarding their prospective destination.

According to Tumpukrenteng Village's government officials and residents, the telecommunication infrastructure, such as cellular phone network had been available in Tumpukrenteng Village since 2002. The villagers had accessed internet since 2005 through internet cafes. Base transceiver station (BTS) towers as a provider and transmitter of cellular's signal were located outside Tumpukrenteng Village, which was in Sukolilo Village, Wajak District, Kedok Village, and Turen District. The BTS towers located two kilometers away from Tumpukrenteng Village and have provided a 4G mobile service for internet users of internet service providers, such as Telkomsel, Indosat, and XL Axiata.

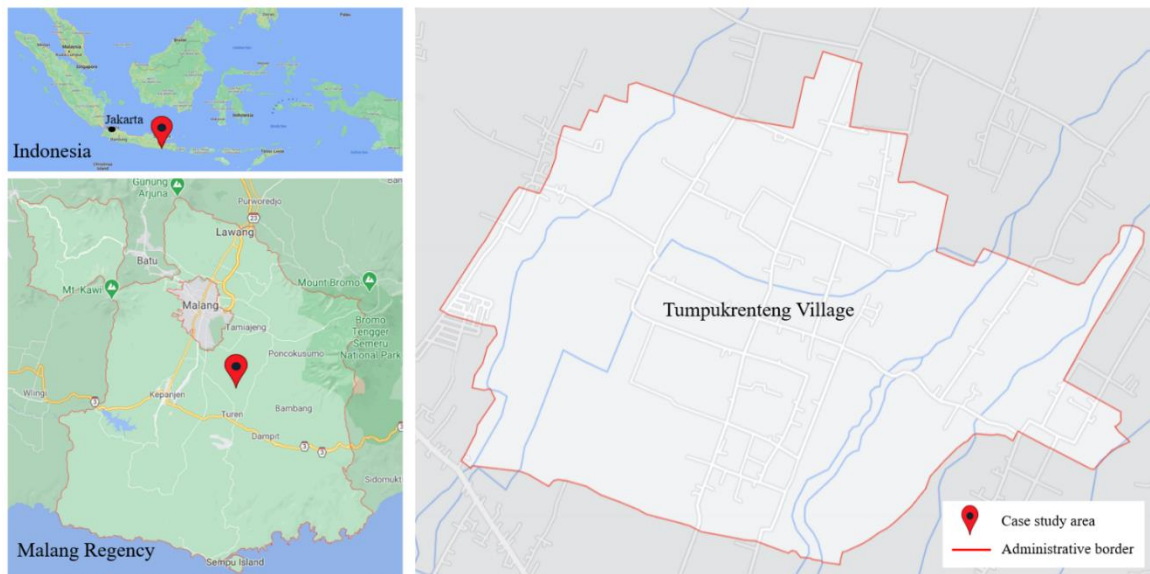


FIGURE 1. LOCATION OF STUDY AREA OF INTERNET ON RURAL-TO-URBAN MIGRATING INTENTIONS OF YOUNG VILLAGERS

Some variables of this research were derived from literatures and summarized in Table 1. Internet's infrastructure was a determinant factor of internet use. It consisted of device and available internet's connections in the case study area. Improving internet infrastructure was a resulting usage pattern.

TABLE 1. VARIABLES AND INDICATORS

Latent Variables and Indicators	References
Internet infrastructure (<i>Infras</i>)	(Moon, Park, Jung, & Choe, 2010; Taipale, 2016)
A1 Number of devices (PC, laptop, smartphone, or combination of them) to access Internet	
A2 Types of networks (mobile data, fixed line, or combination of them) to access Internet	
Internet penetration (<i>Use</i>)	(Aker, Clemens, & Ksoll, 2011; Gigler, 2015; Tsitsika et al., 2009; Ukwandu & Iroh, 2011)
B1 Average daily duration of Internet's usage	
B2 The first time of usage's period (accumulation of duration)	
B3 Frequency of communication with friend who lives in city, per week	
B4 Frequency of communication with family member who live in city, per week	
B5 Difficulty levels on operating device	
B6 Frequency of receiving and sending e-mail per week	
B7 Frequency of using search engines to find information per week	
B8 Frequency of accessing social media per week	
B9 Frequency of watching video per week	
Information through Internet (<i>Content</i>)	(Demiralp, 2009; Jones, 1981)
C1 Frequency of obtaining information about job vacancy in city	
C2 Frequency of obtaining information about income rate in city	
C3 Frequency of obtaining information about health care in city	
C4 Frequency of obtaining information about education in city	
C5 Frequency of obtaining information about living conditions in city	
Migrating intentions (<i>Intention</i>)	(Agadjanian, Neduluzhko, & Kumskov, 2008; Moon et al., 2010; Thissen, Fortuijn, Strijker, & Haartsen, 2010)
Y1 Intention to leave village and live in city	
Y2 Firm plans to leave village and live in city	

Researchers commonly observed usage in measuring impact of internet on a particular issue. This research addressed to regular internet usage such as browsing, gaming, chatting, and social media, along with information received regarding prospective destinations. The usage reflects some daily activities internet. Users receive information regarding prospective destinations accidentally and intentionally during internet usage. Increasing internal usage may increase possibility of receiving information about prospective destinations.

Research data was obtained from a field survey by using a questionnaire. The prospective respondents were young villagers who were 15 to 24 years old. During the preliminary field survey, it was found 866 young villagers. This research employed a simple random sampling and was followed Jacob Cohen's calculation to determine the sample size as recommended in Cohen (1977, 1992) and Sholihin & Ratmono (2013). The sample size of this research was 213 respondents. This research was only focused on the respondent of internet user. Due to this requirement, the authors excluded 20 non-internet user respondents and proceeded 193 eligible respondents to be analyzed. Then, this research distributed a set of questionnaires to eligible respondents and achieved a 100% return rate.

Analysis

This research employed a quantitative approach of Structural Equation Modeling - Partial Least Square (SEM-PLS) to estimate the cause-effect relationship of latent variables. It could process models of different scales (nominal, ordinal, interval, and ratio) from small sample sizes that were less than 100 simultaneously. The SEM-PLS aimed to predict relationships or develop a theory (Ghozali & Latan, 2012; Sholihin & Ratmono, 2013). Meanwhile, the reliability and validity tests were employed in the analysis and model building process to overcome weak theoretical supports.

To develop the questionnaires, latent variables were operationalized based on a review of relevant literature. The questionnaire employed the Likert Scale (1-5) to collect data for indicators B1-B9, C1-C5, Y1, and Y2. A ratio scale was applied for indicators A1 and A2. Three latent-exogenous variables representing the internet were A, B, and C. The variable A or INFRAS referred to the internet infrastructure composed of two formative indicators: A1 and A2. The variable B or USE referred to the internet penetration or usage consisting of nine formative indicators B1-B9. Meanwhile, variable C or CONTENT referred to information obtained from the internet comprising five formative indicators C1-C5.

Y Variable or INTENTION was a latent-endogenous variable that referred to migration intentions measured by two reflective indicators: Y1 and Y2. The variable reflected the maturity intention (Agadjanian et al., 2008) and covered two intention dimensions. Firm plans to leave denoted a deep meaning of intention in their life. The interrelation of the latent variables with each indicator was unidimensional. The unidimensional aspect was a construct composed of formative and reflective indicators. The first step was assessing the construct validity and indicators. Migration in this study refers to rural-to-urban migration. Hypothetical model of the variable can be shown in Figure 2.

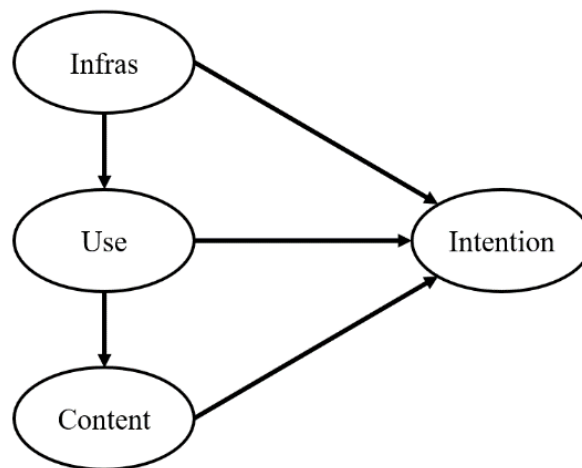


FIGURE 2. HYPOTHETICAL MODEL VARIABLE OF

Note: *Infrás* was internet infrastructure; *Use* was internet penetration; *Content* was attainable information; *Intention* was latent-endogenous variable

Before employing SEM-PLS, this study conducted a reliability and validity test which was adopted to suggestion of Kock (2021). All indicators of latent variables were reflective and formative types. Each type had an individual approach to assessing data validity and reliability. Reflective indicators of latent variables used composite reliability and Cronbach’s alpha in measuring reliability. Observed reflective indicators of latent variables must have scored more than 0.7 for both composite reliability and Cronbach’s alpha tests. This research employed average variance extracted (AVE) to measure the validity. Reflective indicators of latent variables are valid if they surpassed minimum score of 0.5; otherwise, observed variable faced validity issues.

Conversely, formative indicator of latent variables used a different test. This study measured variance inflation factors (VIF). Kock (2021) suggested, formative indicators of latent variables should have a VIF score less than 2.5 and p-loading less than 0.001. Otherwise, formative indicators of latent variables should be deleted from the model.

This research also tested the multicollinearity of all indicators of latent variables. This test was applied to ensure that all indicators were free from collinearity problems by observing average block variance inflation factor (AVIF) and average full collinearity variance inflation factor (AFVIF). The maximum score for both tests was 3.3.

After conducting SEM-PLS analysis, this research measured model fitness by observing average full collinearity VIF (AFVIF), Tenenhaus GoF (GoF), average path coefficient (APC), average R-squared (ARS), average adjusted R-squared (AARS). Table 2 showed the standard score of those indices.

TABLE 2. MODEL FIT INDICES

Measurement	Standard score
Average Full Collinearity VIF (AFVIF)	acceptable if ≤ 5 , ideally ≤ 3.3
Tenenhaus GoF (GoF),	small ≥ 0.1 , medium ≥ 0.25 , large ≥ 0.36
Average Path Coefficient (APC),	$p < 0.05$
Average R-squared (ARS),	$p < 0.05$
Average Adjusted R-squared (AARS).	$p < 0.05$

RESULT AND DISCUSSIONS

Characteristics of Internet Users

According to Indonesian Internet Service Provider Association (2018, 2020), internet penetration in Indonesia annually increases. This study found that 193 (91%) young villagers were internet users. This figure demonstrated high internet’s penetration in this village (Table 3). Compared to young male villagers, fewer young female villagers were non-internet users. This finding supported a previous study discovering that young villagers were the most active internet users (Onitsuka et al., 2018).

TABLE 3. COMPOSITION OF INTERNET USERS AND NON-INTERNET USERS BASED ON GENDER

Gender	User		Non-User		Total	
	n	%	n	%	n	%
Male	75	35.2	11	5.2	86	40.4
Female	118	55.4	9	4.2	127	59.6
Total	193	90.6	20	9.4	213	100

TABLE 4. RESPONDENTS' DEMOGRAPHICAL CHARACTERISTIC

Demography	Classification	Number of respondents	Percentage (%)
Age	15 – 16 Years Old	73	37.82
	17 – 18 Years Old	56	29.01
	19 – 20 Years Old	28	14.51
	21 – 22 Years Old	18	9.33
	23 – 24 Years Old	18	9.33
Place of Birth	In Tumpukrenteng	143	74
	In other villages	45	23
	In municipality	5	3
Marital Status	Unmarried	165	85.86
	Married	27	13.64
	Divorced	1	0.51
Educational Level	No formal education	1	1
	Elementary school	51	26
	Junior high school	97	50
	High school	42	22
	Undergraduate	2	1
	Post graduated	0	0
Occupation	Junior high student	31	16
	Senior high student	81	42
	Undergraduate student	10	5
	Entrepreneur	11	6
	Government official	2	1
	Private company worker	16	8
	Farmer	2	1
	Freelancer	8	4
	Housewife	19	10
	Unemployed	13	7

Note: Internet users only

All of young villagers in this study did not achieve a minimum education level of 9 years formal education (Table 4). Lower education levels will hinder penetration rate and digital literacy (Luthfia, Wibowo, Widyakusumastuti, & Angeline, 2021; Rozaki, 2020; Ünver, 2014). Therefore, some young people did not use the internet. Further, it will affect the quality of human capital and rural development.

Most of the respondents were students who aged 15 to 18 years (62%). This result corresponded to age composition. Some of the school-age respondents (5%) were not students but workers to help their families fulfill their livelihood's need. The unemployment rate in Tumpukrenteng Village was 7%, eventually contributing to regency's unemployment rate (BPS-Statistics of Malang Regency, 2020).

Characteristics of Devices' Usage

Internet's infrastructure refers to all essential components to support distribution of access and internet services to public. The infrastructure includes transmissions (signals or network cabling), network receivers and transmitters (routers, modems, and WAP), and devices (smartphones or laptops) (Kraut & Kiesler, 2003). Table 5 showed types of devices which were operated by youths in Tumpukrenteng village to access internet. More than half of the respondents (74%) used smartphones to access the internet. The smartphone offered various advantages at an affordable, flexible, light, and mobile.

TABLE 5. INTERNET INFRASTRUCTURE OF RESPONDENTS

Categories	Number of respondents	Percentage (%)
Device ownership*		
Personal computer	5	2.5
Laptop	36	18.7
Tablet	13	6.6
Smartphone	141	73.2
Cell phone	5	2.5
Blackberry	34	17.7
Not own any	1	0.5
Type Connection's usage*		
Free Wi-Fi hotspot	67	34.9
Internet café	20	10.6
Mobile data package	159	82.3
Fixed line	3	1.5
Modem	17	8.6
Others	15	7.6
number of connection's usage		
1	121	62.7
2	53	27.5
3	15	7.8
4	4	2.1

* Multiple answer allowed

Possessing more than one device to access internet was a common phenomenon (Indonesian Internet Service Provider Association, 2020). According to the survey,

approximately to 74.61% of internet users had one device to access internet. It implied that the common phenomenon only happens urban areas. Internet users in rural areas could not afford multiple devices because of economic limitations. Respondents with two devices had smartphones and laptops because they offered a flexibility feature to support learning and working activities.

Table 5 showed that mobile data package was the most favorable device for respondents because it supported their mobility. Mobile internet data charged different prices depend on providers and loaded data package. Most mobile's internet users in Tumpukrenteng village use services from Telkomsel and Indosat (i.e., Internet Service Providers) due to their excellent signal quality and internet speed access. Geographical constraints made wireless internet's connections more favorable to increase internet's penetration (Puspitasari & Ishii, 2016). This postulation was relevant to the conditions of Tumpukrenteng Village.

Most of the respondents operated a single connection (62.69%). This study discovered that not all respondent's schools or workplaces provided free Wi-Fi hotspots. The survey result indicated that most students had a single internet network's connection and relied on mobile data package to access internet because their schools did not provide free internet access. Unfortunately, the students could not afford more internet network's connections because they had limited economic capacity. Students with more than one internet network's connection, except for the mobile data package, utilized a free Wi-Fi hotspot provided by their school.

The limited internet's connection might indirectly affect educational attainment and reduce students' opportunity to obtain knowledge from different sources. Shahibi & Rusli (2017) argue that using internet improves students' educational achievement. Non-student respondents with better economic capacity than students with poor economic capacity could afford more multiple internet network's connections. However, mobile data package was the most favorable for student and non-student respondents.

TABLE 6. INTERNET USAGE DURATION

Categories	Number of respondents	Percentage (%)
Daily usage duration		
1-4 hours	143	74.1
5-8 hours	42	21.8
9-12 hours	5	2.6
13-16 hours	1	0.5
more than 16 hours	2	1.0
Duration accumulation		
1-3 years	71	36.8
4-6 years	70	36.4
7-9 years	41	21.2
10-12 years	11	5.6

Majority of respondents spent one to four hours daily internet's accessing. Hence, the respondents' average daily internet usage duration was 6 hours 27 minutes (Table 6). In contrast, the survey of Indonesian Internet Service Provider Association on 2016 and 2020 reports that more than 67% of Indonesian internet users spent less than four hours a day

accessing the internet. It implies that young internet users in rural areas spend more time on the internet. However, the current usage duration is increasing because nearly 43.3% of Indonesian internet users have spent one to four hours on the Internet (Indonesian Internet Service Provider Association, 2020).

Fewer respondents spent more than 16 hours on the internet. Meanwhile, the interview and observation discovered that the active internet's users did not access internet non-stop, but they accessed it several times in an hour though they carried their phones with them. The users with high intensity of internet access were those with personal devices and various internet access options.

Residents of Tumpukrenteng Village have started to use internet since 2005. This study found that accumulation usage duration was associated with age. Older respondents tend to use internet longer than younger users. Commonly, they operated internet for the first time in the final year of primary school or the first year of their secondary education.

This survey's result denoted that 95% of the respondents had no difficulty in operating devices to access internet. They just dealt with basic steps in operating the device, such as turning device on and off and connecting it to the internet network. In contrast, 3% of the respondents faced trouble on accessing internet because they were new users and did not have a device.

Table 7 illustrated that a number of 40% of respondents communicated with friends or acquaintances of city daily using online messenger applications, such as WhatsApp, BlackBerry Mesanger, and LINE. On the contrary, 18% of the respondents never utilized internet for communicating with relatives, friends, or acquaintances of city. Respondents more frequently communicated with friends who live in city than their relatives. This result implies that interaction with friends was more intense.

TABLE 7. COMMUNICATING'S INTENSITY WITH CITY'S PEOPLE

Intensity	Communication with Friends (%)	Communication with Relatives or Family (%)
Everyday	40.40	22.22
2-6 times per week	16.16	15.15
Once per week	9.09	14.14
Once in several weeks	13.64	19.19
Never	18.18	26.77
Total	100.00	100.00

TABLE 8. INTENSITY OF ONLINE ACTIVITIES

Frequency	Receiving and sending e-mail (%)	Using search engines (%)	Accessing social media (%)	Watching videos (%)
Everyday	5	28	58	12
2-6 times per week	8	23	15	21
Once a week	7	17	9	13
Once in several weeks	20	23	8	28
Never	61	9	9	26
Total	100	100	100	100

The users' highest percentage of daily internet activity was accessing social media, such as Facebook and Instagram. Internet offers supplemental information sources, and search

engines are important tools for collecting information. Table 8 demonstrated that 91% of respondents operated search engines, such as Google to gain information. However, only 28% of them interacted with search engines daily. Search engines support work activities, education, and entertainment, such as songs, online games, and movies. This result did not fully reflect internet users' information collection. Social media and online videos can be served as an alternative search engine and information's source.

The respondents frequently accessed social media, such as Facebook and Instagram. The opposite pattern was found in using internet for watching online videos. The lite version of social media applications is available on Google Play store or iOS App Store. In addition, internet service providers give free access to social media. Therefore, the internet was the most frequently operated to access social media. In contrast, fewer respondents accessed online videos, such as music performance, comedy, and news, concerning they required more data credit. Using the internet to receive and send e-mails was least frequently performed by the respondents. Their e-mails were only used to register on particular websites, mainly social media. However, students utilized e-mail more often, mainly for academic purposes.

Migrating Intentions

Tumpukrenteng residents had continually left their village. Unfortunately, no data reported the number of people's migration to other areas, such as cities and countries. The declining population, especially young people, threatened village's development. The number of people's migration can be predicted by knowing their migrating intentions (De Jong, Root, Gardner, Fawcett, & Abad, 1985; Wanner, 2021).

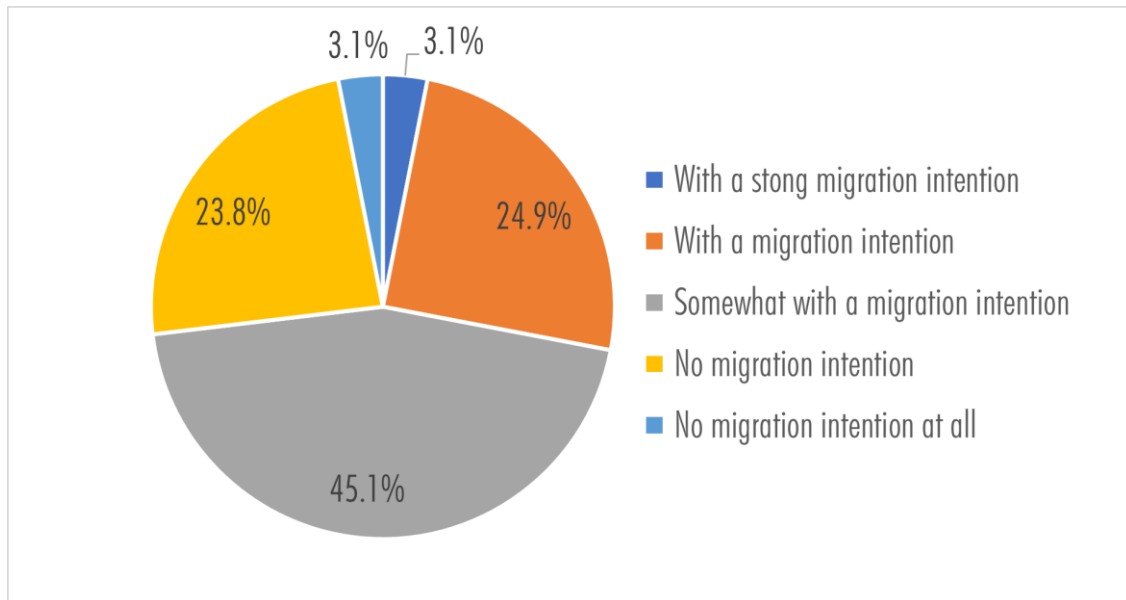


FIGURE 3. INTENTIONS TO MIGRATE TO A CITY

The youth's migrating intentions were characterized by their levels of intention and a firm plan to migrate to a city in the future. Those constructs represented the mature migrating intention. Without a firm plan, migrating intention was just a wish. The research's result

explained that cities refer to urban areas, such as Turen and Kepanjen, and cities, such as Malang, Surabaya, and Jakarta.

Figure 3 demonstrated respondents' patterns' answer. The number of respondents with strong intentions and no intentions to migrate was slightly different. However, most of the respondents considered who interested to migrate, though at a low level by answering "somewhat". This result demonstrated that the number of respondents who interested to migrate was higher than those did not interest.

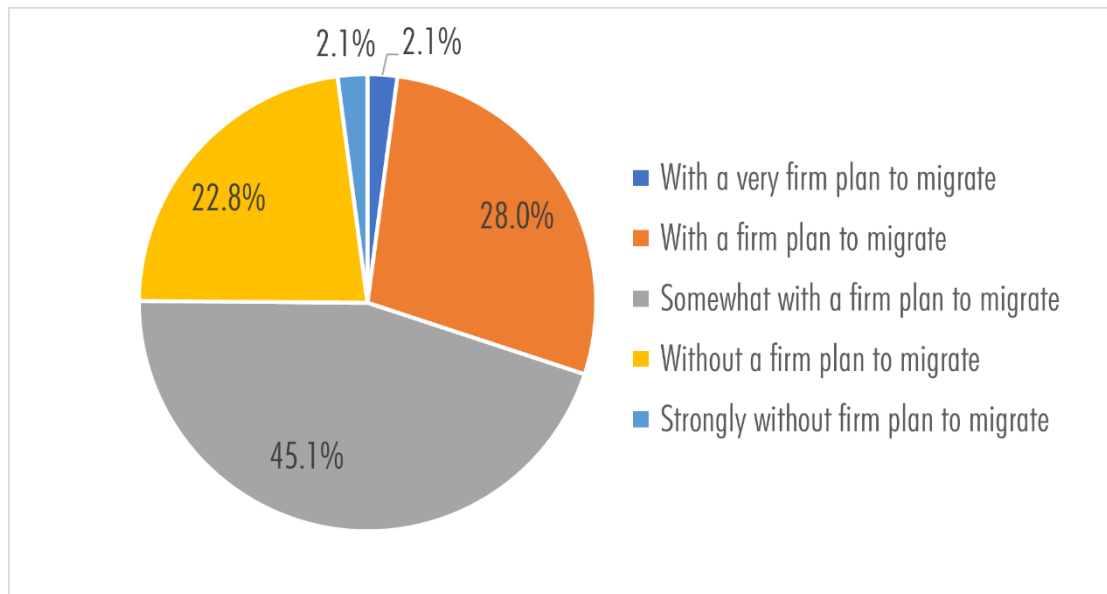


FIGURE 4. FIRM PLAN TO MIGRATE TO A CITY FOR FUTURE

Figure 3 illustrated a similar pattern to figure 4. Respondents with a firm migration plan (30%) were slightly higher than those without a firm plan (25%). Most of respondents (45%) had a firm migration plan. The "somewhat" answer implied that respondents had an incomplete firm plan but had formulated it. To conclude, the number of respondents with a firm plan to migrate was higher than those without a firm plan.

Furthermore, 67.8% of the respondents with a firm and very firm migrating intention were students. It implies that students have more intentions to migrate than non-students who have been working. This intention was assumed to be driven by their desire to work or continue their education in the city. This result agrees with Priatama et al. (2020) finding that young villagers less interest to stay in their village. As conclusion, young villagers have strong intentions to migrate and have a firm plan to realize their migrating intention.

The Effects of the Internet on Migrating Intentions

Measurement model test

1. Formative Indicators Validity Test

Indicators of formative latent variables had a *p*-score less than 0.001. Simultaneously, the VIF values ranged from 1.182 to 2.499. That result implied that all formative indicators were valid to measure the variables in the question.

2. Reflective Indicators Validity and Reliability Test

Y1 and Y2 had an estimated composite reliability coefficient of 0.873 and an estimated Cronbach's alpha of 0.708. Further, those indicators also had an AVE value of 0.774. Briefly, Y1 and Y2 satisfied the reliability and validity standards. Those results imply that Y1 and Y2 indicators of the reflective latent variable were reliable and valid.

3. Multicollinearity Test

The average block variance inflation factor (AVIF) and average full collinearity VIF (AFVIF) were 1.293 and 1.347, respectively. The results satisfied to standard. It implied that the model did not encounter a vertical collinearity problem of latent prediction variables and lateral collinearity between the prediction and criterion latent variables.

Structural model test

To determine the strength and direction of interaction among latent variables, authors observed path coefficient, p-values, effect size, and R2. Figure 5 demonstrates that each exogenous variable of internet positively and significantly affected migrating intentions. Internet also allowed user to improve their information exchange flow. This finding of this model denoted three points.

1. The existing internet's infrastructure was positively associated to migrating intentions.
2. Internet usage was positively associated to migrating intentions.
3. The collected information from the Internet was positively associated with migrating intention.

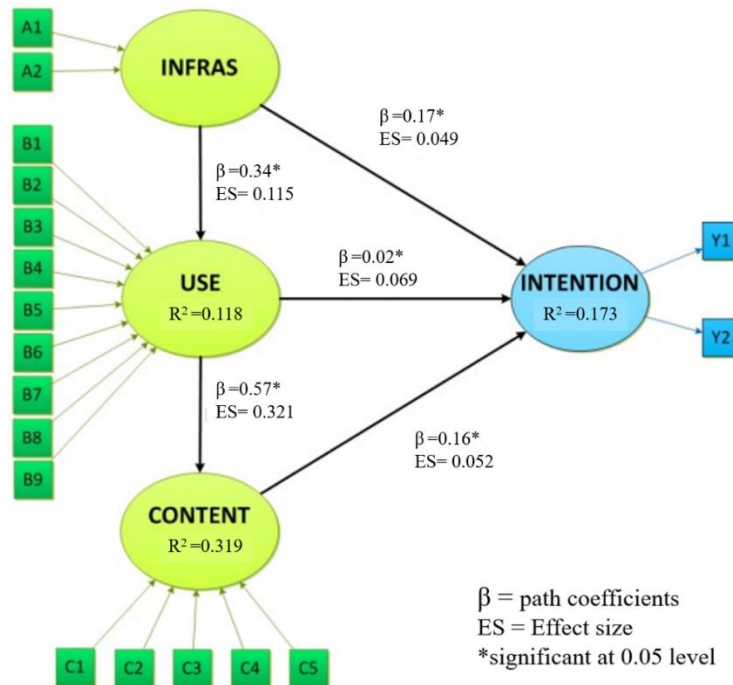


FIGURE 5. RESULTS OF STRUCTURAL EQUATION MODEL'S ANALYSIS

Note: *Infras* was internet infrastructure; *Use* was internet penetration; *Content* was attainable information; *Intention* was latent-endogenous variable

The result showed that internet's infrastructure, use, and information's content significantly affected to migrating intention. Observed variables could explained 17.3% of the total variance of migrating intention. This result supported Moon et al. (2010) finding that internet significantly impacts migration intention. However, the observed variables in this study could explained the total variance of migrating intention more than Moon et al. (2010) observed variables. Authors argued that this research addressed not only daily internet use but also the content of obtained information which did not observe in Moon et al, (2010) research.

Mobile Internet's networks and several public internet's facilities had been available in Tumpukrenteng. This study revealed that the internet's infrastructure was associated with one's migration intention. An amount of 73.7% of internet users accessed internet using smartphones, and 83.8% used mobile internet's connections. It denoted that the youths had flexible access to internet regardless of when and where they accessed it using multiple devices. The flexibility of accessing internet can encourage them to migrate to cities for better internet's access and free public internet's facilities in public places, such as restaurants, city parks, offices, and government facilities. Otherwise, the flexibility of accessing internet and growing the internet's infrastructure in village area can discourage the youths' migration to cities.

Approximately 74.1% of users accessed internet for 1-4 hours in a day. This number exceeds the national users' daily use duration rate (Indonesian Internet Service Provider Association, 2020). Some internet users faced difficulty operating devices and insufficiently mastered English content. Nonetheless, the village youths could access the internet for various purposes, such as socializing on social media, collecting information through search engines, and watching online videos. Students could access internet to collect data for their school projects, while entrepreneurs utilized the internet for advertising their products or seeking business inspiration. These beneficial internet activities influenced the youths to migrating intention. Moreover, some youths accessed internet information to build intentions of getting a job or to migrate to cities.

A particular internet's usage for various activities can inspire youths to get information from every part of the world, including cities they want to migrate (Boas, 2017). The result indicated that respondents frequently operated internet, especially to access social media and to communicate with friends who live in a city (Table 7 and Table 8). Those activities eventually provide information regarding prospective destinations. Engaging information about job vacancies, high salary levels, health insurance, good education, and cordial environments in destined cities also encourage youths to migrate (Dekker & Engbersen, 2014; Dekker et al., 2016). On the other hand, some information about tough life in urban areas can discourage them to migrate and to convince them to stay in the village (Onitsuka & Hidayat, 2019). In this sense, internet helps its users increase their knowledge of prospective destinations, which is necessary for the migration decision process.

The result demonstrated an adverse impact of internet usage. Improving internet's infrastructure, collecting information regarding prospective destinations, and using internet for general uses are likely increase migrating intention of rural youth. Of the rural

development point of view, the migrating intention of the youth adversely impact rural activities due to a declining labor force, especially agricultural labor forces. Further, food production in the rural area is disturbed. Oppositely, this adverse impact is also beneficial for the household to ensure household income. A study reported that migration produces remittances beneficial for household economy (Eversole & Shaw, 2010) and simultaneously rural development by providing financial contribution in rural activities (Hidayati, 2020; Rempel & Lobdell, 1978). However, remittance cannot fully replace human capital loss in rural development (Rempel & Lobdell, 1978). Sustained rural emigration leads to agricultural abandonment and environmental degradation in some severe cases (Massey, Axinn, & Ghimire, 2010; Xu, Deng, Guo, & Liu, 2019).

The government currently attempts to provide internets for all Indonesian citizens across country (Faizah, Yamada, & Pratomo, 2021; Ray & Ing, 2016). It expects that better internet's infrastructure in the upcoming year. The result of this research showed that improving infrastructure increase internet usage and migrating intention. Regardless internet's infrastructure improvement accelerates migrating intention and produce rural's labor force loss, internet allows prospective migrants to better connect with active migrants as a social network. This social network is a safety net in migrating by social and economic support at the destination (Comola & Mendola, 2015).

Implication

To address adverse impact of internet usage, policy and regulation regarding internet's penetration should fully address this adverse impact. Further, internet's infrastructure improvement is expected to accelerate in the upcoming years and has no option of halting the progress. Economic aspects mainly cause villagers to migrate (Marta, Fauzi, Juanda, & Rustiadi, 2020; Meitasari, 2017). Promoting internet gains economic benefits and would become a possible solution. Studies have shown that villagers have successfully adopted the internet to gain economic benefits (Fahmi & Sari, 2020; Kusumadinata, 2016).

Besides economic motivation, pursuing higher education has motivated young villagers to migrate due to limitation of education's facility in a village. Long-distance learning development is improving but still limited (Siahaan & Rivalina, 2013). The youth's migration will benefit village development because they improve human capital. However, their return must avoid brain-drained incidents. A ready e-commerce village is one of the possible solutions. Several studies suggest that government should develop better e-commerce facilities, such as internet's infrastructure, village tele-center, and logistic systems (Islam, Kazal, & Rahman, 2016; Zeng, 2019). The availability of these facilities still varies in each rural area. However, the current condition shows that the facilities are improving (Gunawan, 2020; Rahayu & Day, 2015).

CONCLUSION

Tumpukrenteng had many internet's users with relatively high intensity for various activities. These internet's users actively access to operate social media, watch online videos,

and browse information through search engines. However, few users were familiar with e-mail usage. A few users acquire either direct or indirect information about living in urban areas.

The internet had accelerated migrating intention of users in Tumpukrenteng Village. This research's result enriches previous findings that internet has an essential role in migration process, particularly to accelerate migrating intention. Most of them have a moderate level of internet's access. This number was related to the village's relatively stable social, environmental, and economic conditions, which trigger the residents to think that migrating was less urgent. In this digital era, internet use is inevitable.

This result demonstrated that internet contributes to migrating intention. This study was the first attempt to investigate direct impacts of internet on the early stage of migration in Indonesia. Further research needs to consider different migration types, such as rural to rural migration and international labor migration, to enrich Indonesian rural migration discussions.

The main limitation of this research was only addressing internet and migrating intention. Socio-economic aspects were considered as control variables. Those were likely to affect internet use and migration decisions separately.

Acknowledgment: This research is partially funded by Kyoto University.

Authors contributions: M.D.C.I.: study concept, data acquisition, data analysis, and writing the manuscript. AR.R.T.H.: study concept, review and writing manuscript. D.D.: study concept and review manuscript. K.O.: review study concept and design, and data acquisition.

Conflict of interest: The authors declare no conflict of interest.

REFERENCE

- Agadjanian, V., Nedoluzhko, L., & Kumskov, G. (2008). Eager to Leave? Intentions to Migrate Abroad among Young People in Kyrgyzstan. *International Migration Review*, 42(3). <https://doi.org/10.1111/j.1747-7379.2008.00140.x>
- Aker, J., Clemens, M., & Ksoll, C. (2011). Mobiles and Mobility: The Effect of Mobile Phones on Migration in Niger. *Proceedings on the German Development Economics Conference*, (2), 22. Berlin: ZBW - Deutsche Zentralbibliothek für Wirtschaftswissenschaften, Leibniz-Informationszentrum Wirtschaft, Kiel und Hamburg. Retrieved from <http://hdl.handle.net/10419/48341>
- Bargh, J. A., & McKenna, K. Y. A. (2004). The Internet and Social Life. *Annual Review of Psychology*, 55(1), 573-590. <https://doi.org/10.1146/annurev.psych.55.090902.141922>
- Boas, I. (2017). Environmental Change and Human Mobility in the Digital Age. *Geoforum*, 85, 153-156. <https://doi.org/10.1016/j.geoforum.2017.07.022>
- BPS-Statistics of Malang Regency. (2016). *Kecamatan Turen Dalam Angka 2016*. Malang: BPS-Statistics of Malang Regency.
- BPS-Statistics of Malang Regency. (2020). *Tingkat Pengangguran Terbuka*.

- BPS-Statistics of Malang Regency. (2021). *Kecamatan Turen dalam Angka (Turen Subdistrict in Figure) 2021*. Malang: BPS-Statistics of Malang Regency.
- Carney, D., Drinkwater, M., Rusinow, T., Neefjes, K., Wanmali, S., & Singh, N. (1999). *Livelihood approaches compared: a brief comparison of the livelihoods approaches of the UK Department for International Development (DFID), CARE, Oxfam and the UNDP*. Retrieved from <https://www.eldis.org/document/A28159>
- Cohen, J. (1977). *Statistical Power Analysis for the Behavioral Sciences*. Elsevier. <https://doi.org/10.1016/C2013-0-10517-X>
- Cohen, J. (1992). A Power Primer. *Psychological Bulletin*, 112(1), 155–159. <https://doi.org/10.1037/0033-2909.112.1.155>
- Comola, M., & Mendola, M. (2015). Formation of Migrant Networks. *The Scandinavian Journal of Economics*, 117(2), 592–618. <https://doi.org/10.1111/sjoe.12093>
- De Jong, G. F., Root, B. D., Gardner, R. W., Fawcett, J. T., & Abad, R. G. (1985). Migration Intentions and Behavior: Decision Making in A Rural Philippine Province. *Population and Environment*, 8, 41–62. <https://doi.org/10.1007/BF01263016>
- Dekker, R., & Engbersen, G. (2014). How Social Media Transform Migrant Networks and Facilitate Migration. *Global Networks*, 14(4), 401–418. <https://doi.org/10.1111/glob.12040>
- Dekker, R., Engbersen, G., & Faber, M. (2016). The Use of Online Media in Migration Networks. *Population, Space and Place*, 22(6), 539–551. <https://doi.org/10.1002/psp.1938>
- Demiralp, B. (2009). The Impact of Information on Migration Outcomes. In *MPRA Paper No. 16121* (No. No. 16121). <https://doi.org/10.2139/ssrn.1431069>
- Eversole, R., & Shaw, J. (2010). Remittance Flows and Their Use in Households: A Comparative Study of Sri Lanka, Indonesia and the Philippines. *Asian and Pacific Migration Journal*, 19(2), 175–202. <https://doi.org/10.1177/011719681001900201>
- Fahmi, F. Z., & Sari, I. D. (2020). Rural Transformation, Digitalisation and Subjective Wellbeing: A case Study from Indonesia. *Habitat International*, 98, 102150. <https://doi.org/10.1016/j.habitatint.2020.102150>
- Faizah, C., Yamada, K., & Pratomo, D. S. (2021). Information and Communication Technology, Inequality Change and Regional Development in Indonesia. *Journal of Socioeconomics and Development*, 4(2), 224. <https://doi.org/10.31328/jсед.v4i2.2669>
- Forman, C., Goldfarb, A., & Greenstein, S. (2005). Geographic Location and the Diffusion of Internet Technology. *Electronic Commerce Research and Applications*, 4(1), 1–13. <https://doi.org/10.1016/j.elerap.2004.10.005>
- Galtier, F., David-Benz, H., Subervie, J., & Egg, J. (2014). Agricultural Market Information Systems in Developing Countries: New Models, New Impacts. *Cahiers Agricultures*, 23(4–5), 232–244. <https://doi.org/10.1684/agr.2014.0716>
- Ghozali, I., & Latan, H. (2012). *Partial Least Squares: Konsep, Metode dan Aplikasi menggunakan Program WarpPLS 2.0 untuk Penelitian Empiris*. Semarang: Badan Penerbit Universitas Diponegoro.

- Gigler, B. S. (2015). Development as Freedom in a Digital Age: Experiences from the Rural Poor in Bolivia. In *Development as Freedom in a Digital Age: Experiences from the Rural Poor in Bolivia*. The World Bank. <https://doi.org/10.1596/978-1-4648-0420-5>
- Global Migration Group. (2014). *Migration and Youth: Challenges and Opportunities*.
- Gunawan, A. (2020). Usulan Pengembangan Bisnis Rural Logistics E-Commerce di PT. Pos Indonesia (Persero). *Jurnal Ilmiah Teknologi Infomasi Terapan*, 6(3), 194–201. <https://doi.org/10.33197/jitter.vol6.iss3.2020.432>
- Hardono, A. (1988). Rural telecommunication system in Indonesia. *International Conference on Rural Telecommunications*, 50–55.
- Hidayat, A. R. T., Onitsuka, K., Sianipar, C. P. M., & Hoshino, S. (2022). Distance-Dependent Migration Intention of Villagers: Comparative Study of Peri-Urban and Remote Villages in Indonesia. *Administrative Sciences*, 12(2), 48. <https://doi.org/10.3390/admsci12020048>
- Hidayati, I. (2017). The Role of Social Media on Migration Decision-Making Processes: Case of Indonesian Student in University of Groningen. *Jurnal Studi Pemuda*, 6(1), 515. <https://doi.org/10.22146/studipemudaugm.38010>
- Hidayati, I. (2020). Migration and rural development: The impact of remittance. *IOP Conference Series: Earth and Environmental Science*, 561, 012018. <https://doi.org/10.1088/1755-1315/561/1/012018>
- Indonesian Internet Service Provider Association. (2016). Penetrasi & Perilaku Pengguna Internet Indonesia. Retrieved from https://web.kominfo.go.id/sites/default/files/Laporan_Survei_APJII_2017_v1.3.pdf
- Indonesian Internet Service Provider Association. (2018). Penetrasi & Profil Perilaku Pengguna Internet Indonesia. Retrieved www.apjii.or.id
- Indonesian Internet Service Provider Association. (2020). Hasil Survei Internet APJII 2019-2020-Q2. Retrieved from <https://apjii.or.id/content/read/39/521/Hasil-Survei-Internet-APJII-2019-2020-Q2>
- International Telecommunication Union. (2021). Measuring digital development: Facts and figures 2021. Retrieved from <https://www.itu.int/en/ITU-D/Statistics/Pages/facts/default.aspx>
- Islam, F., Kazal, M., & Rahman, M. (2016). Potentiality on E-Commerce in the Rural Community of Bangladesh. *Progressive Agriculture*, 27(2), 207–215. <https://doi.org/10.3329/pa.v27i2.29332>
- Jones, R. C. (1981). The Impact of Perception on Urban Migration in Latin America. *Proceedings of the Conference of Latin Americanist Geographers*, 8, 119–127. Retrieved from <http://www.jstor.org/stable/25764934>
- Kock, N. (2021). *WarpPLS© User Manual: Version 7.0*. Texas: ScriptWarp Systems.
- Kotyrló, E. (2020). Impact of Modern Information and Communication Tools on International Migration. *International Migration*, 58(4), 195–213. <https://doi.org/10.1111/imig.12677>

- Kraut, R., & Kiesler, S. (2003). *The Social Impact of Internet Use* (pp. 8–10). pp. 8–10.
- Kustanto, M., & Sholihah, F. (2020). Reserve Brain Drain sebagai Alternatif Mengatasi Kemiskinan. *Jurnal Litbang: Media Informasi Penelitian, Pengembangan Dan IPTEK*, 16(1), 63–76. <https://doi.org/10.33658/jl.v16i1.164>
- Kusumadinata, A. A. (2016). Penggunaan Internet di Kalangan Petani Sayur dalam Memperoleh Informasi Pertanian di Kabupaten Cianjur. *Indonesian Journal of Agricultural Economics (IJAE)*, 7(1).
- Lee, E. (1966). A Theory of Migration. *Demography*, 3(1), 47–57. <https://doi.org/10.2307/2060063>
- Luthfia, A., Wibowo, D., Widyakusumastuti, M. A., & Angeline, M. (2021). The Role of Digital Literacy on Online Opportunity and Online Risk in Indonesian Youth. *Asian Journal for Public Opinion Research*, 9(2), 142–160. <https://doi.org/10.15206/ajpor.2021.9.2.142>
- Lyu, H., Dong, Z., Roobavannan, M., Kandasamy, J., & Pande, S. (2019). Rural Unemployment Pushes Migrants to Urban Areas in Jiangsu Province, China. *Palgrave Communications*, 5, 92. <https://doi.org/10.1057/s41599-019-0302-1>
- Marta, J., Fauzi, A., Juanda, B., & Rustiadi, E. (2020). Understanding Migration Motives and Its Impact on Household Welfare: Evidence from Rural–Urban Migration in Indonesia. *Regional Studies, Regional Science*, 7(1), 118–132. <https://doi.org/10.1080/21681376.2020.1746194>
- Massey, D. S., Axinn, W. G., & Ghimire, D. J. (2010). Environmental Change and Out-Migration: Evidence from Nepal. *Population and Environment*, 32, 109–136. <https://doi.org/10.1007/s11111-010-0119-8>
- Meitasari, I. (2017). Minat Pemuda Desa untuk Urbanisasi di Desa Sukasari, Kabupaten Majalengka, Jawa barat. *Jurnal Geografi, Edukasi Dan Lingkungan*, 1(2).
- Ministry of Agriculture. (2014). *Statistik Lahan Pertanian Tahun 2009-2013*. Retrieved from <http://epublikasi.setjen.pertanian.go.id/arsip-perstatistikan/167-statistik/statistik-lahan/393-statistik-lahan-2014>
- Ministry of Telecommunication and Information Technology. (2015). *Buku Putih 2015: Komunikasi dan Informatika Indonesia*. Jakarta: Puslitbang Sumber Daya, Perangkat dan Penyelenggaraan Pos dan Informatika, Badan Penelitian dan Pengembangan Sumber Daya Manusia, Kementerian Komunikasi dan Informatika.
- Moon, J., Park, J., Jung, G. H., & Choe, Y. C. (2010). The Impact of IT Use on Migration Intentions in Rural Communities. *Technological Forecasting and Social Change*, 77(8), 1401–1411. <https://doi.org/10.1016/j.techfore.2010.04.018>
- Muta'ali, L. (2013). *Rural Area Development (Spatial Perspective)*. Yogyakarta: Badan Penerbit Fakultas Geografi Universitas Gajah Mada.
- Nguyen, L. D., Raabe, K., & Grote, U. (2015). Rural-Urban Migration, Household Vulnerability, and Welfare in Vietnam. *World Development*, 71, 79–93. <https://doi.org/10.1016/j.worlddev.2013.11.002>

- Onitsuka, K., & Hidayat, A. R. T. (2019). Does ICT facilitate or impede rural youth migration in Indonesia? *The 9th International Conference Rural Research & Planning Group (IC-RRPG) "Asian Rural Sustainable Development: Promoting Spiritual, Culture Values and Local Practices."* Denpasar: Universitas Mahasaraswati Denpasar. Retrieved from <https://e-journal.unmas.ac.id/index.php/IC-RRPG/article/view/232>
- Onitsuka, K., Hidayat, A. R. T., & Huang, W. (2018). Challenges for the Next Level of Digital Divide in Rural Indonesian Communities. *The Electronic Journal of Information Systems in Developing Countries*, 84(2), e12021. <https://doi.org/10.1002/isd2.12021>
- Palfrey, J., & Gasser, U. (2008). *Born Digital: Understanding the First Generation of Digital Natives*. Berkeley: Basic Books.
- Pardede, E. L., McCann, P., & Venhorst, V. A. (2020). Internal Migration in Indonesia: New Insights from Longitudinal Data. *Asian Population Studies*, 16(3), 287–309. <https://doi.org/10.1080/17441730.2020.1774139>
- Priatama, R., Onitsuka, K., Rustiadi, E., & Hoshino, S. (2020). Social Interaction of Indonesian Rural Youths in the Internet Age. *Sustainability*, 12(1), 115. <https://doi.org/10.3390/su12010115>
- Puspitasari, L., & Ishii, K. (2016). Digital Divides and Mobile Internet in Indonesia: Impact of Smartphones. *Telematics and Informatics*, 33(2), 472–483. <https://doi.org/10.1016/j.tele.2015.11.001>
- Rahayu, R., & Day, J. (2015). Determinant Factors of E-commerce Adoption by SMEs in Developing Country: Evidence from Indonesia. *Procedia - Social and Behavioral Sciences*, 195, 142–150. <https://doi.org/10.1016/j.sbspro.2015.06.423>
- Ray, D., & Ing, L. Y. (2016). Addressing Indonesia's Infrastructure Deficit. *Bulletin of Indonesian Economic Studies*, 52(1), 1–25. <https://doi.org/10.1080/00074918.2016.1162266>
- Rempel, H., & Lobdell, R. A. (1978). The Role of Urban-to-Rural Remittances in Rural Development. *The Journal of Development Studies*, 14(3), 324–341. <https://doi.org/10.1080/00220387808421678>
- Rini, A. N., & Rahadiantino, L. (2020). The Role of Internet Utilization Among SMEs on Household Welfare in Indonesia. *Jurnal Ekonomi Indonesia*, 9(1), 25–37. <https://doi.org/10.52813/jei.v9i1.42>
- Rozaki, Z. (2020). Decrease of agricultural land and industry growth in Special Region of Yogyakarta. *IOP Conference Series: Earth and Environmental Science*, 458. <https://doi.org/10.1088/1755-1315/458/1/012033>
- Shahibi, M. S., & Rusli, K. N. K. K. (2017). The Influence of Internet Usage on Student's Academic Performance. *International Journal of Academic Research in Business and Social Sciences*, 7(8). <https://doi.org/10.6007/IJARBS/v7-i8/3301>
- Sholihin, M., & Ratmono, D. (2013). *Analisis SEM-PLS Dengan WarpPLS 3.0*. Yogyakarta: Andi.
- Siahaan, S., & Rivalina, R. (2013). Perkembangan Pendidikan Terbuka dan Jarak Jauh di Indonesia. *Jurnal Teknodik*, 16(1), 59–72. <https://doi.org/10.32550/teknodik.v0i0.8>

- Statistics Indonesia. (2013). *Organisasi dan Kegiatan Sensus Pertanian 2013 di Indonesia (Edisi ke 2)*. Jakarta: Statistics Indonesia.
- Statistics Indonesia. (2018). *Hasil Survei Petanian antar Sensus SUTAS 2018*. Jakarta: Statistics Indonesia.
- Statistics Indonesia. (2020). *Persentase Penduduk Daerah Perkotaan menurut Provinsi, 2010-2035*. Retrieved from <https://www.bps.go.id/statictable/2014/02/18/1276/persentase-penduduk-daerah-perkotaan-hasil-proyeksi-penduduk-menurut-provinsi-2015-2035.html>
- Taipale, S. (2016). Do the Mobile-Rich Get Richer? Internet Use, Travelling and Social Differentiations in Finland. *New Media & Society*, 18(1), 44-61. <https://doi.org/10.1177/1461444814536574>
- Thissen, F., Fortuijn, J. D., Strijker, D., & Haartsen, T. (2010). Migration Intentions of Rural Youth in the Westhoek, Flanders, Belgium and the Veenkoloniën, The Netherlands. *Journal of Rural Studies*, 26(4), 428-436. <https://doi.org/10.1016/j.jrurstud.2010.05.001>
- Thulin, E., & Vilhelmson, B. (2014). Virtual Practices and Migration Plans: a Qualitative Study of Urban Young Adults. *Population, Space and Place*, 20(5), 389-401. <https://doi.org/10.1002/psp.1766>
- Tsitsika, A., Critselis, E., Kormas, G., Filippopoulou, A., Tounissidou, D., Freskou, A., ... Kafetzis, D. (2009). Internet Use and Misuse: a Multivariate Regression Analysis of the Predictive Factors of Internet Use among Greek Adolescents. *European Journal of Pediatrics*, 168, 655-665. <https://doi.org/10.1007/s00431-008-0811-1>
- Ukwandu, E., & Iroh, S. (2011). Influence of ICT in the Rural-Urban Migration in Owerri Zone of Imo State, Nigeria. *Journal of Information Technology Impact*, 11(1), 51-58.
- Ünver, H. (2014). Explaining Education Level and Internet Penetration by Economic Reasoning - Worldwide Analysis from 2000 through 2010. *International Journal for Infonomics*, 7(1/2), 898-912. <https://doi.org/10.20533/iji.1742.4712.2014.0107>
- Wanner, P. (2021). Can Migrants' Emigration Intentions Predict Their Actual Behaviors? Evidence from a Swiss Survey. *Journal of International Migration and Integration*, 22(3), 1151-1179. <https://doi.org/10.1007/s12134-020-00798-7>
- Wilsonoyudho, S., Rijanta, R., Keban, Y. T., & Setiawan, B. (2017). Urbanization and Regional Imbalances in Indonesia. *Indonesian Journal of Geography*, 49(2), 125. <https://doi.org/10.22146/ijg.13039>
- Xu, D., Deng, X., Guo, S., & Liu, S. (2019). Labor Migration and Farmland Abandonment in Rural China: Empirical Results and Policy Implications. *Journal of Environmental Management*, 232, 738-750. <https://doi.org/10.1016/j.jenvman.2018.11.136>
- Yulianto, E., Utari, P., & Satyawan, I. A. (2020). Communication Technology Support in Disaster-Prone Areas: Case Study of Earthquake, Tsunami and Liquefaction in Palu, Indonesia. *International Journal of Disaster Risk Reduction*, 45, 101457. <https://doi.org/10.1016/j.ijdr.2019.101457>
- Zeng, M. (2019). Research on the Last Mile Delivery of Rural E-commerce in China. *Proceedings of the 2018 International Symposium on Social Science and Management Innovation (SSMI 2018)*. Paris, France: Atlantis Press. <https://doi.org/10.2991/ssmi-18.2019.89>