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Digital Divide of Forest Farmers in Gunungkidul Regency of Indonesia

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Abstract

Digital divide is one of global issue mostly experienced by developing countries due to the gap of socioeconomic levels between individuals, households, business, and geographic area. This condition affects the different opportunity to access information and communication technologies (ICTs). This research aims to analyze the digital divide level of forest farmers in Gunungkidul Regency, Indonesia. Three villages in Gunungkidul Regency – Dengok Village, Jepintu Village, and Katongan Villages – were chosen purposively by considering those villages were the training location of Master TreeGrower (MTG) from Australia. The total samples were 60 farmers in which each villages was selected 20 forest peasants by simple random sampling. The data were analyzed using the Likert scale and proportional statistical test. The results show that more than 50% of forest farmers have a high level of digital divide.

Keywords: digital divide, forest farmers, internet, ICTs

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1. Introduction

The amount of internet users in the world raises every year. Internet World Stats (2018) shows that the user number climbs 1.066% from 2000 to 2018. The penetration rate of user reaches 55.1% of world population in the middle of 2018. Asia as one of the world region has contributed 49% of the internet user population in the world. Indonesia is the third country of the most internet users in Asia after China and India. At the end of 2017, 7.1% of internet user in Asia came from Indonesia. Ministry of Communication and Informatics of Indonesia (Kominfo, 2017) reported that in Indonesia, the percentage of internet users were 45% of Indonesia population. This number depicts the internet becomes more popular among society recently. However, the distribution of internet utilization was centralized in the west part of Indonesia. The index of digital divide shows that Papua, Sulawesi, Nusa Tenggara, and Maluku as the east part of Indonesia have higher index score than Sumatera and Java as the eastern part of Indonesia. Skill and infrastructure were factors influencing the digital divide in those areas (Ariyanti, 2013). In the other side, a job also causes the digital divide. Kusumadinata (2016) found

that less than 15% farmer use internet although the number of gadget ownership keep increasingly up to the rural area.

Special Region of Yogyakarta is the second province of Indonesia that has the smallest index score of digital divide after Jakarta. As a student city of Indonesia, the internet has a critical role in daily activities. The high requirement to improve skill and infrastructure supports the high increase of internet access; thus it influences the index score. The number of internet user keeps growing into a rural area and reaches the agriculture sector. Gunungkidul located in east part of Special Region of Yogyakarta is potential as forest area reaching 15,330.1 Ha (BPS, 2017). The use of the internet becomes essential to improve productivity as well as income of forest farmer. Analyzing the digital divide of forest farmer is interesting to know the gap of internet use among them. This research aims to analyze the digital divide level of forest farmers in Gunungkidul Regency, Indonesia.

2. Literature Review

2.1. Digital Divide

According to Noris cit. Subiakto (2013), the concept of digital divide is adopted from a developing country to distinguish development divide between the community in the urban and remote area. Urban community has felt the effect of infrastructure developments in Information and Communication Technologies (ICTs). While OECD cit. Wahyuningtyas et al. (2016) define the digital divide as:

"... the gap between individuals, households, businesses, and geographic area at different socio-economic level with regard both to their opportunities to access information and communication technologies (IT) and to their use of the internet for a wide variety of activities."

Some definitions of the digital divide are also given by experts — Marine et al. cit. Putra (2009) describes the digital divide as the access gap in information source from a country to others as well as from an area to others. Zuhal (2010) reports that the digital divide is disparity phenomena to access technology, especially in distributing and accessing information affecting social problem in society. Van Dijk cit. Hadiyat (2006) said that the digital divide is a gap between who possess and is not possess access to computer and internet. Based on those definitions, it can be concluded that the digital divide is the gap on access and utilization of new media effectively in the level of an individual, household, business, and geographic area.

2.2. The Utilization of ICTs in Gunungkidul Regency

People in Gunungkidul Regency has used new media, i.e. cellular phone/ smartphone, computer (PC/laptop/tablet), and the internet to communicate with each other. The ICTs utilization of people in Gunungkidul Regency is shown in Table 1.

Table 1: The Utilization of ICTs in Gunungkidul Regency in 2017.

No.	Device	Use Percentage (%)
1	Cellular phone/smartphone	66.79
2	Computer/PC/Laptop/Tablet	12.39
3	Internet	26.12
Source: BPS 2017 (processed)		

Table 1 shows the use percentage of ICTs devices on more than 5-year-old people in Gunungkidul Regency. Cellular phone/smartphone is the highest device used by people there due to its multifunction. By accessing cellular phone/smartphone, people can make a call, send Short Messages Services (SMS) and Multimedia Message Services (MMS), access internet, use business and game application, and take pictures or video. While computer/PC/laptop/tablet is the lowest device used because mostly used by office workers who have high mobility.

Table 2: The Percentage of Household Member Aged More Than 5 Years Olds based on Biological Sex, Educational Level and ICTs Use in The Last Three Months.

Characteristics	Cellular Phone User	Cellular Phone Ownership	Computer User	Computer Ownership
Biological Sex				
Male	70.55	62.04	14.12	28.05
Female	63.31	50.61	NA	24.35
Educational Level				
Uneducated/ not graduating from elementary school	36.58	19.14	3.3	3.99
Elementary school	66.58	56.4	9.31	17.86
Junior High School	84.46	74.99	13.23	31.57
Senior High School and more	95.74	93.23	28.86	64.18
Source: BPS 2017 (processed)				

Table 2 shows users and owners of cellular phone and computer dominated by people with high educational background. This table also depicts the lower educational level than the lower percentage of user and owner of a cellular phone and computer. Moreover, the male has a higher percentage for both user and owner of cellular and computer because need ICTs to support his works.

3. Methods

The research was located in Dengok Village, Playen Sub-district, Jepitu Village, Girisubo Sub-district, and Katongan Village, Nglipar Sub-district. Those three villages were chosen due to the location of Master TreeGrower (MTGs), a program from Australia to gain the cultivation skill of forest farmers in Gunungkidul Regency. MTGs trainers were not local people thus this program needs ICTs to support monitoring and evaluation. In the future, this research is important to describe the level of adoption and diffusion of agricultural technology brought from external community related to its readiness. Each village was selected 20 forest farmers using simple random sampling in which 20 samples included ten male and ten female. The respondents were 60 forest farmers in total.

The data of the digital divide were tabulated as nominal and ordinal scale. In order to assess quantitatively, the respondent answer is processed into Likert Scale in which 1 (one) is the least and 5(five) is the highest. In order to get interpretation result from Likert Scale, the highest score from each value item is checked using this formula:

$$\% \text{ index} = \frac{N}{Y} \times 100\%$$

in which,

N=score total

Y=the highest Likert Scale × respondent total

While proportional statistical test was used to know the percentage of forest farmers who have a high digital divide by using this formula:

$$Z = \frac{\frac{x}{n} - Po}{\sqrt{\frac{Po(1-P0)}{n}}} \quad (\alpha = 5\%)$$

in which,

x = total of forest farmers in Gunungkidul who have high digital divide

n = sample total

Po = population proportion

If Z $\leq$ Z table, Ho is accepted and Ha is rejected. In contrary, if Z $>$ Z table, Ho is rejected and Ha is accepted. Ho means that it is expected that less than or equal to 50% forest farmers in Gunungkidul Regency has high digital divide and Ha means that it is expected more than 50% forest farmers in Gunungkidul Regency has a high digital divide.

4. Results and Discussion

4.1. The ICTs Access of Forest Farmers in Gunungkidul Regency

The ICTs access of forest farmers depicts the use of gadgets, computer/PC, and the internet in the last four weeks or the whole last month. The use includes visiting a website or checking email via those new media. As shown in Table 3, the average of forest farmers accesses them is only 27.07%. This low score is caused by the low use of forest farmer in laptop and computer/PC with or without an internet connection. Some of them have this technology but rarely use those devices. They bought them to support the activities of their family members. The device used frequently by forest farmers was a smartphone. A smartphone is chosen due to its multifunction, small size, interactive application, and easy use.

TABLE 3: The use of gadget, Computer/PC, and Internet in Gunungkuidul in 2018.

No	Indicator	Interval Score	Average Score	Percentage (%)
1	The use of smartphone in the last four weeks	0-2	0.87	43.5
2	The use of laptop in the last 4 weeks	0-3	0.4	13.33
3	The use of computer/PC in the last 4 weeks	0-3	0.38	12.67
4	The internet access at home in the last	0-2	0.78	39
5	The use of laptop to visit website or access email in the last 4 weeks	0-3	0.4	13.33
6	The use of smartphone to visit website or access email in the last 4 weeks	0-2	0.9	45
7	The use of computer/PC to visit website or access email in the last 4 weeks	0-3	0.38	12.67
	Total	0-18	4.12	
	Average			27.07

5. Source: Dewinta, 2018

4.2. The Digital Divide of Forest Farmers in Gunungkidul Regency

Digital divide can be assessed from demographic aspects, including biological sex, age, educational level, and income as depicted in Table 4. Based on biological sex, the ICTs use for the male was higher than for female. Male lifestyle influenced by their work and society require them to keep upgrading technology compared to female. The use of forest farmers who were between 15-59 years old is higher than they who were more than or equal to 60 years old. Mardikanto (1993) said the old people tend to be

slower for receiving new information but the young usually is more dynamic and active to do many things, including accept, learn, and use new media to collect information and expand a network. The use of forest farmers who have been studying or were graduated from undergraduate school also achieved a high user percentage compared to lower educational level. The higher educational level, the higher need to access information from new media due to their work and lifestyle is. Lastly, all forest farmers who have income more than 5 million rupiahs have already use gadgets, computer/PC, and the internet. They have put ICTs as a primary need to access information and communication. Contrary, only 21.77% of the lowest income society of forest farmers has already utilized those devices. They categorized ICTs as tertiary need which will be fulfilled after primary and secondary needs are achieved.

Table 4: The demographic aspects of forest farmer access on gadgets, computer/PC, and internet in Gunungkidul Regency.

Characteristics	Percentage of ICTs User	Percentage of Total Samples
Biological Sex		
Male	30.79%	50%
Female	23.10%	50%
Age		
15-59 years old	30.52%	83%
≥ 60 years old	6.49%	16%
Educational Level		
Junior High School	16.88%	35%
Senior High School	37.14%	43%
Undergraduate School	56.12%	12%
Income		
< Rp 700 thousand	21.77%	35%
Rp 700 thousand - < Rp 2 million	20.83%	40%
Rp 2 million - < Rp 3 million	49.74%	15%
Rp 3 million - < Rp 4 million	33.93%	7%
≥ Rp 5 million	100%	3%
Source: Dewinta 2018		

To interpret and decide the rank or percentage of index result (%), interval analyses were conducted as shown in Table 5. When the access of digital devices is in an interval between 0-19%, 20-39%, 40-59%, 60-79%, and 80-100%, the category of the digital divide is the highest, high, average, low, and the lowest respectively. The lower interval on accessing digital devices describes the lower number of forest farmers using. It means the digital divide between user and non-user is high. As depicted in Table 6,

the number of forest people in Gunungkidul Regency who has low use in digital devices was 85%. This percentage shows that the digital divide is higher. On contrary, low digital divide only reached 15% of forest farmers.

Table 5: Percentage of Interval Index as result of Likert Score.

Interval	**Category**
0% – 19%	The highest
20% – 39%	High
40% – 59%	Average
60% – 79%	Low
80% – 100%	The lowest
Source: Dewinta 2018	

The result of the proportional statistical test shows that the Z table (1.645) is less than the Z count (13.08). It means that more than 50% of forest farmers have a high digital divide. Actually, this result has been seen in Table 6 in which the number of them who have high digital divide were 85%. Table 4 also shows that from the total sample, less than 50% of forest farmer accessed digital devices. Although more than 50% forest farmers who have studied in or was graduated from undergraduate school, as well as who, have more than 5 million rupiah income used a digital device, the total sample of those two categories was the lowest.

Table 6: The Forest Farmer Distribution based on Digital Divide in accessing gadget, computer/PC and Internet in Gunungkidul Regency.

No	Digital Divide Categorize	Number (people)	Percentage (%)
1	High	51	85
2	Low	9	15
	Total	60	100
Source: Dewinta, 2018			

5. Conclusion

The increase of digital device use and ownership in Indonesia should reduce the level of the digital divide. However, the digital divide of forest farmers in Gunungkidul regency is still high. Almost half of them have already used smartphone recently to visit a website and access email. Forest farmers who have a high educational level and income have utilized digital devices optimally to meet their lifestyle needs.

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