

Dryland Farmers' Access to Productive Resources (A Case Study of Wonogiri)

Dwi Prasetyani^{1*} and Akhmad Daerobi²

^{1,2} Universitas Sebelas Maret, Jl Ir Sutami 36th, 57126, Surakarta, Indonesia

ABSTRACT

Objective – This research is built on the argument that providing farmers with more access to natural resources can reduce poverty and so increase production in farming, particularly in the case of Wonogiri.

Methodology/Technique – The method of analysis used for this research is the IRAP (Integrated Rural Accessibility Planning) method which was developed by the International Labour Organization (ILO) and the government agencies of Africa and Asia.

Findings – Based on the calculation of access, it is noted that priority problems of access to productive resources can be resolved by focusing on four factors. First is Education - Strategies that can be implemented is the construction of new schools, particularly junior and senior high schools. Second is Health - Strategies that can be implemented is to increase farmers' access to water resources and to increase the number of general practitioners available such as specialists and dentists. Third is Agriculture - Strategies that can be done is to improve existing markets, add new markets, and develop new farmer groups. Fourth is Support - Strategies that can be done is by building layers of foundation and paving stones and casting roads on the remaining land. Of utmost importance is Education.

Novelty – New found strategies that can be implemented include the construction of new schools for poor farmers.

Type of Paper: Empirical

Keywords: Dryland Farmers; Productive Resources; Wonogiri; IRAP; Access; Strategy.

JEL Classification: Q13, Q18.

1. Introduction

Dryland farming development in Indonesia is still untouched. One area that has the potential marked for the development of dryland farming is Wonogiri. Dry land in Wonogiri area makes up 149,916 hectares with nearly half of the moor having the potential for the development of food crops. Of the current agriculture existing in Wonogiri, there are some food crops that have been identified as suitable for dryland farming and they include corns, cassavas, soybeans, sweet potatoes, and green beans

Presently, Wonogiri is behind many other districts in terms of productivity. A follow-up is certainly needed from local governments and other stakeholders who are able to provide productive resources for dryland

* Paper Info: Received: October 4, 2016

Accepted: December 24, 2016

* Corresponding author:

E-mail: nd_prasetyani@yahoo.com

Affiliation: Universitas Sebelas Maret, Indonesia

farmers in the region as well as improve farmers' access to these resources. Dryland farmers' limited access to natural resources have been noted by studies. Sindizingre (2006), for example, mentioned that many studies of developing countries had noted that the poor people have limited access to markets and institutions. The poor people also face many risks, get little return on their assets, and they are also very disadvantaged in terms of know-how, knowledge and support from government (Sindizingre, 2006). Poor people also lack education; thus, they often end up as manual laborer like farmers. In this regard, , there is an association between menial jobs and poverty, particularly in developing countries. More of their income for consumption and only very little part to investment. Thus, their capacity to improve the well-being to be very limited.

In his study, Christiaensen (2006) also stated that poor farmers can be deprived of certain things too such as access to health services, and other less important resources such as clean water, prayer buildings, market and so on. Chjristaensen's (2006) study also noted that poor farmers also have limited access to other services such as irrigation, transportation, and personal communication. Hence, it is not wrong to assume that they also have a level limited of capacity to participate equally in the nation's economic growth. From their study, Deolalikar et.al. (2002) proposed an instrument that could help to reduce poverty among poor people and yet increase their access to social services, particularly, health and education. Prior to this, the word "access" is further defined.

2. Literature Review

The term, access, is defined by Ribot and Peluso (2003) as the ability to generate a profit from anything, including material objects, individuals, institutions, and symbols. Correspondingly, Warapani (2002) defined accessibility as the level of ability to achieve or obtain goods and services needed. In another view, access was defined by Parikesit et al., (2002) as the level of difficulty or ease the population has in obtaining goods or services required. Meanwhile, Donnges (2003) stated that rural access can be defined as the ability, the difficulty level of the villagers to use, achieve or obtain goods and services that are needed. Seen from the perspective of productive resources, access is defined as the ability to allow someone to take advantage of the services, both primary and secondary. Productive resources, as disclosed by Nissanke (2009) and Baye (2002), was inspired by the World Bank (2000) which classified resources into two main categories, namely primary assets and secondary assets. In this study, productive resources are grouped into four components namely: Education Resources, Health, Agriculture, and Supporting resources.

The assessment of accessibility has been done for a variety of productive resources such as the accessibility of public transport services (Attard, 2012; Mishra et al., 2012), the accessibility of health services (Wallace, & MacEntee, 2011), product accessibility and communication technology information (Easton, 2011), as well as access and affordability of electricity (Winkler et al., 2011). These studies used a variety of methods to measure accessibility.

In particular, an approach to measure the access of rural people to productive resources have been developed by the International Labour Organization (ILO). The approach in question is the Integrated Rural Accessibility Planning (IRAP) which was introduced in 1996 (ILO, 2003). This approach puts the household as the unit of analysis, thereby strengthening the participatory process that already exists at local government level. The IRAP instrument was developed as a means of helping local governments to identify priorities in rural infrastructure investments which can address the real needs that are accessible to the poor (education, health care, clean water, transportation, marketing). Communities participated in this project to jointly review their access and to identify priorities for investment.

In their study of some rural areas in South Africa, Sarkar and Ghosh (2000) also applied the IRAP method to show that accessibility of the rural households to basic needs was insufficient. Respondents expressed the importance of having access to water resources, education, and health besides other facilities. These findings strongly support the regional development planners' aim to create intervention facilities in selected villages or rural groups.

Sarkar et al., (2008) also studied three villages of Rajasthan, India. He was able to show that the poor's accessibility to basic needs of rural households was very low. They were very dependent on the resources available in the village. While access to the means of transport was almost non-existent, some facilities such as water supply and basic education was available but inadequate. From this study, it was suggested that development planners at the national level should be more concerned about the quality of the facilities provided to the poor.

Wibowo and Azwansyah (2009) focused on one of the villages in the province of West Kalimantan. They also used the IRAP method to determine the need for access to real villagers. Their results showed that there were six sectors that were considered as very important by the population to improve accessibility. They include agriculture, water, markets, health, education and fisheries sector. Interventions need to be done by the local government in particular, the handling of transport infrastructure, should be given focus by increasing the network of roads and by repairing bridges that can be used throughout the years.

Oliansyah (2013) also used the IRAP method to assess the benefits of a street in one of the villages in West Kalimantan. The results showed that the road leading to the various sectors have different benefits. Because it is necessary to evaluate the various programs, planning of road infrastructure is necessary in order to produce a program that is highly effective.

Juniardi and Azwansyah (2014) studied the accessibility of basic infrastructure for rural communities in two villages in West Kalimantan by using the IRAP. The study concluded that there are different priorities for infrastructure projects in both villages. To improve the accessibility of such infrastructure, facilities and the provision for the means of transportation need to be improved. The other infrastructure such as the village road was still relatively good.

3. Research Methodology

To investigate dryland farmers access to productive resources in Wonogiri, this research employs a research design that uses qualitative data extracted from indepth interviews.

3.1 Sample

The research site noted in this context is directed at the dryland farming site of Central Java, Wonogiri. The population size of the farmers here total 604.632 pulled form over 25 districts. The multistage sampling method (Waridin, 1999; Susilowati et al., 2005) was applied to gather 150 respondents who are dryland farmers from three districts located in Wonogiri. The quota sampling technique was based on a certain quota. The stages involved in the multistage sampling method consist of: 1) Determining the main commodity crop suitable for dryland farming in Wonogiri. 2) Based on the seed sector, selecting three districts that are suitable. In the case of Sub Pracimantoro, the crop identified to have the most potential for development is maize; In the district of Paranggupito, the commodity most suitable is cassava, and in the district of Giriwoyo, the most appropriate crop for development is soybeans. 3) In-depth interviewing of key persons selected from every district captured.

3.2 Analysis Methods

The IRAP method (Integrated Rural Accessibility Planning) which was developed by the International Labour Organization (ILO) together with government agencies in Africa and Asia (Donnges, 2003), was applied for data analysis. The IRAP design was used with the intention of resolving issues of rural development, in this case, accessibility to resources. The IRAP comprises a few levels of procedure.

The first step in the IRAP is to first prepare a profile access in every village that is to be studied. Following that, the indicator of accessibility (accessibility indicator) is calculated. In this context, the indicators of accessibility is referred to the objective measure of rural households which experience difficulty in accessing various social facilities, economic facilities and other services. The actual level of access measured is then

translated into numerical values. It is hope that this can give a ranking based on the priorities of the rural communities being studied. The formula to determine the accessibility indicator is adopted from Ali (2000) and it is as below:

$$AI = HH \times (TT \text{ (Travel Time Score)}) \quad (1)$$

Where;

HH = Households

TT = Travel Time

AI = Accessibility Indicator

Per the formula shown above, Equation (1) shows the household (HH) representing the affected population. Time (TT) represents a barrier for the population to utilize the facilities. This serves as the accessibility indicator showing the absence of the accessibility of an activity.

The variable quality of the facility can be included so that the equation becomes as what the ILO (2006) proposes:

$$AI = HH \times [TT \text{ (Travel Time Score)} + Q \text{ (Quality Score)}] \quad (2)$$

Where;

Q = Quality Score

In this context, if the quality attributes to a facility of more than one; then the formula becomes:

$$AI = HH \times (TT + \text{Quality (Qia + Qib)} + (\text{Qiiia} + \text{Qiiib}) \text{ or } (\text{Qia} + \text{Qib}) + (\text{Qiiia} + \text{Qiiib})) \quad (3)$$

Where Qi shows various quality attributes. In this case, the formula can include fewer attributes or many attributes, depending on the information required. Weighting score is based on how a skilled worker or key informant use it as a resource.

The second step of using the IRAP is to determine the priority of the accessibility problems. With the known values of accessibility being available, the priority regions and sectors can thus be determined. The higher value of accessibility indicates that it is a priority area or priority sector.

The third step of using the IRAP is to determine if the model improves the accessibility to priority sectors. After identifying the problem in the villages being studied, a proper solution to improve citizens' accessibility to the necessary facilities need to be improved. The IRAP method takes on a participatory approach (bottom up) where the citizens identify the problems and provide the appropriate solutions to solving them. Thus, it can be said that the dryland farmers of this research answered three fundamental questions of what to do, where do, and how to do.

4. Result and Discussion

4.1 Research Area

Wonogiri Districk has an area of 182,236.02 Hectares or 5.59 % area of land in the Central Java Province. Its coordinates: 70 32' - 80 15' S and 1100 41'- 1110 18'E. A large part of its natural state is composed of rocky limestone mountains especially in the South including the Seribu Mountains range which is a source of water Solo River. Wonogiri has a tropical climate, two seasons: rainy and summer, and average temperature of 24°C-37°C.

4.2 Farmers Access to Productive Resources

Table 1 shows the differences in accessibility among the three districts. The higher the value of accessibility the weaker the level of access and vice versa. The value of accessibility for the farmers in the study area showed that the values could be very diverse.

In the education sector, accessibility value to both junior high and senior high schools is positive, meaning that the two levels of education is still a problem for the area. In fact, junior high and senior high schools were not spread out to all villages except a few villages in the district town.

In the health sector using indicators of water sources, it appears that citizens in the farming occupation had difficulties accessing health centers, pharmacies and medical practices. These were still barriers. Similarly, in the agriculture sector, it appears that all the sub-sectors, except for the extension sub-sector, is of positive values. A relatively high value in the subsector of agricultural cooperatives. Based on interviews with respondents, cooperation in the research area is still undeveloped. More cooperative services to credit services. yet provide the service provision of agricultural inputs such as seeds, fertilizer, and chemicals.

Table 1. The Average level of Farmers accessibility in the Study Area

Sector	Subsector	Access Value			Average
		Farmers in Paranggupito	Farmers in Giriwoyo	Farmers in Pracimantoro	
EDUCATION	Elementary	0	0	0	0
	Junior School	1,085	1,073	2,574	1,577
	High School	543	1,621	2,016	1,393
HEALTH	Water Supply	2,415	0	1,370	1,262
	Health Service	1,207	272	182	554
	Drugstore	1,207	550	594	784
	Clinic	2,600	810	2,901	2,104
AGRICULTURE	Farming Tool	685	521	441	549
	Farming Input	989	1,660	221	957
	Processing Service	0	130	0	43
	Product Market	2,093	2,492	173	1,586
	Farmers	1,369	602	844	939
	Farmers Cooperative	0	3,302	0	1,101
	Extention	0	0	0	0
SUPPORTING	Bank	0	413	334	249
	Market	186	0	0	62
	Post Office	186	810	767	588
	Gas Station	0	1,399	221	540
	Electricity	0	0	0	0
	Road	3,347	5,218	2,928	3,831

Source : Primary Data, processed (2015)

From the data shown, it can be seen that sub sectors of the market of agricultural products also have high accessibility value. This could be because warehouse facilities have not existed yet. Meanwhile, the supporting sectors also remain to be a barrier for farmers to access. Clearly, the value of the road sub-sector is relatively high. This means that the road conditions for the citizens who are farmer are still problematic. Data from in-depth interviews noted that some of the roads being used are still unpaved and in damaged condition. Some roads were also impassable to farmers. Besides this, it is clear that farmers in the district of Paranggupito and

Pracimantoro have problems accessing health services while farmers in Sub Giriwoyo had more problems in accessing agricultural resources such as agricultural cooperatives, market products, and agricultural input.

4.3 Improvement Strategy

Information drawn from in-depth interviews with key persons of each village also had some provisions in terms of goals and strategies to improve farmers' access to productive resources. These objectives and strategies were different in accordance with the priorities of the problems encountered. More is seen in table 2.

Table 2. Matrix Identification of Problems, Goals and Strategy to Increase Access

No	Problems	Goals	Strategy
1	Education		
	Junior High school -A considerable distance to the junior high, especially certain villages	Improved Acces	Development of new schools
	Senior High School - A Considerable distance to the high school, especially certain villages	Improved Accesr	Development of new schools
2	Health		
	Water Resource -There are still many use rainwater tank -Water insufficeient in dry season	Adequate Clean Water	- The development of water reservoirs with adequate filter system (plastic drum containing gravel and charcoal that has been burned and washed)
	Health Service -Number of doctors are lacking -No dentist	Adding Doctors	-Addition Doctors and specialist -the need Dentist
3	Agriculture		
	Farmer Cooperative -Location less accessible by farmers -Limited service	Develop Farmers Cooperative	Cooperative to work with various partners in procurement, processing, and marketing; so that cooperatives can play a role in the upstream to downstream in the agri-commodity system members.
	Agricultural Product Market - There are no permanent agricultural products market in the district - Product market at the village level, the facilities are not sufficient	Agricultural Product Market Development	Improvement existing markets, and build a market in the district
3	Farmers -The type of services limited -There are still many farmers who did not participate farmer groups	Farmers Development	Jointly owned store development, cooperation farmer groups with counselors, department of agriculture, and related stakeholders.
4	Supporting		
	Road -There are still many rocky roads and land	Roadwork	-Development of the base layer and paving stones -Casting roads remain soil -Repairs on damaged asphalt road

	-Asphalt road conditions are broken		
--	-------------------------------------	--	--

Source : Primary Data, processed (2015)

5. Conclusion

Based on the results shown in Table 2, it can be seen that the strategy proposed to improve dryland farmers access to productive resources is to create active participation and commitment of stakeholders. The local government can act as the facilitator in financing the productive resources. The IRAP (Integrated Rural Accessibility Planning) can be considered as indicators of accessibility for farmers to access productive resources. The calculation of the access can thus be arranged in order of priority. In this case production facilities by third parties, employers, agricultural product processing can be instrumental in developing a partnership with farmers in developing productive resources. In addition, limitations of the government and the private sector can be resolved by enlisting the help of private companies through the CSR (Corporate Social Responsibility). Other programs and strategies that can be implemented to improve farmers' access is to provide education to them first. Strategies need to be implemented for the construction of new schools, particularly junior and senior high schools. Second is Health and strategies need to be implemented to increase farmer's access to water resources and health clinics. This can be achieved by increasing the number of general practitioners, specialists and dentists. Third, is to implement agricultural strategies by providing support in terms of new markets, current markets and the development of new farmer groups. Fourth, support can be provided by building layers of foundation and paving stones thereby creating casting roads for transportation and accessibility to other productive resources.

References

- Attard, M. (2012). Reforming the urban public transport bus system in Malta: Approach and acceptance. *Transportation Research Part A: Policy and Practice*, 46(7), 981-992.
- Baye, F. M. (2002). Rural institutions, access to primary assets and poverty in two villages in Cameroon. *Pakistan Economic and Social Review*, 121-152.
- Collier, W., Santoso, K., & Soentoro, W. R. (1996). Pendekatan Baru dalam Pembangunan Pedesaan di Jawa: Kajian Pedesaan selama Dua Puluh Lima Tahun. *Jakarta: Yayasan Obor Indonesia*.
- Christiaensen, L. J., Demery, L., & Khl, J. (2006). *The role of agriculture in poverty reduction: An empirical perspective* (Vol. 4013). World Bank Publications.
- Daerobi, A. (2013). Model Pemberdayaan Petani Tanaman Pangan Lahan Kering Di Kabupaten Wonogiri. Disertation PDIE Undip.
- Deolalikar, A. B., Brillantes, A. B., Gaiha, R., Pernia, E., & Racelis, M. (2002). *Poverty reduction and the role of institutions in developing Asia* (No. 10). Manila: Asian Development Bank.
- Donnges, Ch. (2003). Rural Access and Employment, The Laos Experience. Development Policies Departement. ILO office Geneva.
- Juniardi, F., & Azwansyah, H. (2014). Penyusunan Sistem Informasi Geografis Infrastruktur Transportasi Kabupaten Kapuas Hulu Berbasis WEB. *Jurnal ELKHA*, 6(1).
- Mishra, S., Welch, T. F., & Jha, M. K. (2012). Performance indicators for public transit connectivity in multi-modal transportation networks. *Transportation Research Part A: Policy and Practice*, 46(7), 1066-1085.
- Nissanke, M. (2009). Linking Economic Growth to Poverty Reduction under Globalisation: A Case for Harnessing Globalisation for the Poor in Sub-Saharan Africa. School of Oriental and African Studies University of London
- Parikesit, D., & Magribi, L. O. M. (2005). Development of a dynamic Model for Investigating the Interaction between Rural transport and Development: A Case of Southeast Sulawesi, Indonesia. *Journal of the Eastern Asia Society for Transportation Studies*, 6, 2747-2761.
- Parikesit, D, Pribadi, K S and Dwiryanto, R (2004) Rural Infrastructure Development : Problem and Perspective, Working Paper (in Bahasa Indonesia), Coordinating Team of Rural Infrastructure Development, Coordinating Ministry of Economic Affaires, Government of Indonesia.
- Ribot, J. C., & Peluso, N. L. (2003). A theory of access. *Rural sociology*, 68(2), 153-181.

- Sarkar, S., Bose, P. K., Samanta, P., Sengupta, P., & Eriksson, P. G. (2008). Microbial mat mediated structures in the Ediacaran Sonia Sandstone, Rajasthan, India, and their implications for Proterozoic sedimentation. *Precambrian Research*, 162(1), 248-263.
- Sarkar, A. K., & Ghosh, D. (2000). Meeting the accessibility needs of rural poor. *IASSI Quarterly*, 18(4), 1-5.
- Sindzingre, A. (2006). Institutions, Development and Poverty. AFD (Agence Française de Développement) Working Paper July 2006, Paris.
- Susilowati, I., & Tohir, M. Waridin; Tri Winarni; Agung Sudaryono. (2005). *Pengembangan Model Pemberdayaan Masyarakat Pesisir (Usaha Mikro, Kecil, Menengah dan Koperasi-UMKMK) Dalam Mendukung Ketahanan Pangan di Kabupaten/Kota Pekalongan*.
- Wallace, B. B., & MacEntee, M. I. (2012). Access to dental care for low-income adults: perceptions of affordability, availability and acceptability. *Journal of community health*, 37(1), 32-39.
- Warapani, S. P. (2002). *Pengelolaan Lalu lintas dan Angkutan Jalan*. ITB, Bandung.
- Waridin. (1999). Fisher's Participation in Poverty Allevation Program: A Case Study in To Less-Developed Villages in Pemalang District, Central Java. *Journal of Coastal Development*, 3(1), 519-529
- Wibowo, H., & Azwansyah, H. (2009). Penggunaan Metode IRAP dalam Penentuan Prioritas Program Pembangunan Infrastruktur Perdesaan (Study Kasus Desakalimas Kecamatan Sungai Kakap Kabupaten Kubu Raya). *Jurnal Rekayasa*, 13(3), 229-238.
- Winkler, H., Simões, A. F., La Rovere, E. L., Alam, M., Rahman, A., & Mwakasonda, S. (2011). Access and affordability of electricity in developing countries. *World Development*, 39(6), 1037-1050.