

RURAL AMENITIES VALUES OF MULTI-FUNCTIONAL ROLES OF AGRICULTURAL DEVELOPMENT

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ABSTRAK

Peranan sektor pertanian sangatlah luas, tidak hanya menghasilkan *private good* tetapi juga *public good murni* dan *quasi public good*. Keindahan bendungan Cirata dan Jatiluhur sebagai salah satu objek wisata agro di Jawa Barat dapat dikelompokkan ke dalam quasi-public good, dimana seseorang dapat dikecualikan bila ia tidak memenuhi peraturan yang ditetapkan oleh pemerintah setempat. Pengunjung dapat menikmati keindahan kedua bendungan tersebut bila mereka membayar sejumlah uang sebagai imbalan seperti tiket masuk untuk rekreasi. Travel Cost Method (TCM) telah digunakan untuk nilai ekonomi dari aminitas pedesaan yang disediakan oleh bendungan Cirata dan Jatiluhur serta faktor-faktor yang mempengaruhi jumlah pengunjung kedua bendungan tersebut. Hasil analisis menunjukkan bahwa bendungan Jatiluhur secara nyata mampu menarik jumlah pengunjung lebih besar dibandingkan dengan bendungan Cirata. Pengunjung Jatiluhur sebagian besar termasuk masyarakat dari klas pendapatan menengah ke atas, sebaliknya Cirata dikunjungi oleh klas menengah ke bawah. Jumlah anggota pengunjung dalam satu kelompok, umur serta jenis pekerjaan kepala rombongan merupakan faktor-faktor penentu variabilitas ongkos perjalanan. Sedangkan jumlah pengunjung secara kelompok sangat ditentukan oleh pendapatan ketua rombongan dan jarak dari tempat asal ke bendungan.

Kata kunci: Amenitas Pedesaan, Ongkos Perjalanan, Jumlah Anggota Pengunjung.

INTRODUCTION

Back Ground

Rural amenities are one of the multifunctional roles of agricultural development that offer public or quasi-public good for the society to enjoy in it. No one can be excluded for using this type of pure public good. Unless it is belong to quasi-public good that one is potential to be excluded from getting any joy. A private good is one that is freely traded in the market place yet potential users can be excluded from using its. A motorcycle is an example of private good. Meanwhile, a public good is one that any potential user cannot be excluded from using. The standard example of a pure public good is national defense. A quasi-public good is similar to a private good in that potential user can be excluded. Unlike a private good though, it is not

freely traded in the market place. National wildlife refuge is an example of quasi-public good. For this good, potential users, such as hunters, can be excluded through the reservation process (such as ticket for hunting permits). However the price for this activity is not set in the marketplace. Instead, it is set through some bureaucratic process not necessarily reflecting the potential users to use the site.

Public and quasi-public benefits can be divided into two general categories such as use values and nonuse values. Use values consist of both consumptive uses, such as fishing, swimming, hunting, irrigation, and non-consumptive uses, such as bird watching. Non-use values include option, existence and bequest values. Option value is the value some one places on preserving the right to be able to use a good sometime in the future. Existence value is the value some one places on a good just for knowing that it exists, even if that person may never use or see the good. That this value actually exists is demonstrated by the fact that people pay wildlife organization to protect the animal species such as Orangutan in Kalimantan or Sumatera tiger.

Rural amenities provided by agriculture like the beauty of big scale of water reservoir (such water dam) that is used for irrigation, water electric power, fish culture, etc might belong to quasi-public good. Visitor is asked to pay for getting permit to enter the place as one of the agro-tourism target area. Unintended fisherman may exclude in here since they were not pay attention to the regulation being set by the local authority. Two big dam alongside the Citarum river basin are Cirata in Cianjur District and Jatiluhur in Purwakarta District. These two dams in West Java are the main target of visitor from nearby Jakarta to enjoy recreation with all member of family during weekend or holiday.

Of the type of benefit discussed above, travel cost method (TCM) can be used to estimate use values such as amenities value of Cirata and Jatiluhur Dam. TCM is based on observed recreational-site visitation data therefore, unless some correlation can be observed between the good that is being assessed and the observed recreational site visitation, TCM is of no use.

Objective

The research objective is to provide policy-makers with specific insights, tools and information with which to analyze the various role of agriculture within their societies and from which to make-to-make informal policy decisions in pursuit of sustainable agriculture and rural development.

Expected Outputs

- A methodology for identification, qualification and analysis of the roles of agriculture, and the analysis of related policy options;
- Case study-based analytical finding on the roles of agriculture in Indonesia;
- A synthesis of major findings on the roles and their policy implications, including how their importance and the policy actions that they imply vary according to different country setting.

RESEARCH METHODOLOGY

Travel cost method (TCM) assumes weak complementary between environmental assets and consumption expenditure. This implies that, when consumption expenditure is zero, the marginal utility of the public good is also zero (Hanley et.al, 1997). So if traveling cost to an object of tourism becomes so expensive that no one goes there any more, the marginal social cost of a decrease in the quality of that place is also zero. The TCM cannot therefore estimate non-user values (Larson, 1992). An implicit assumption made in most travel cost studies is that the representative visitor's utility function is separable in the recreation activity being modeled. This mean that, if the activity of interest is fishing, then the utility function is such that demand for fishing trips can be estimated independently of demand. On many occasions, policy makers are more interested in the value of changing the characteristics of a site in the value of the site to. The TCM can be used for such calculations.

TCM methods can also be applied that uses travel cost to a recreational site as a proxy for the price of the trips and the number of trip as quantity to statistically estimate a demand curve for a site. Travel cost demand equation can be estimated

using either the individual observation approach (direct survey of visitors) or zonal averages.

Locations and Number of Respondents

In this study, a direct and face-to-face survey was conducted for visitor of two sites such as (1) Cirata Dam in Jangari, Cianjur District and (2) Jatiluhur Dam in Purwakarta District. A total of 60 visitors were randomly sampled at each site for a total of 120 visitors. A simple simultaneous model was design to estimate the variability of travel cost (TC) of visitors with respect to its explanatory variables.

Travel Cost Model

The travel cost model for Jatiluhur dam (TC_{JTL}) in Purwakarta District can be written as follows

$$TC_{JTL} = \delta_0 + \delta_1 AGE + \delta_2 EDUC + \delta_3 INC + \delta_4 NOVT + \delta_5 TIME + \delta_6 D_1 + \delta_7 D_2 + \delta_8 D_3 + \varepsilon_i \quad \dots\dots\dots (1)$$

$$NOVT = \gamma_0 + \gamma_1 INC + \gamma_2 NOVT + \gamma_3 TC + \gamma_4 DIST + \gamma_5 TIME + \gamma_6 D_1 + \gamma_7 D_2 + \varepsilon_i \quad \dots\dots\dots (2)$$

Meanwhile, travel cost model for Cirata dam at Jangari in Cianjur District can be written as follows

$$TC_{JTL} = \eta_0 + \eta_1 AGE + \eta_2 EDUC + \eta_3 INC + \eta_4 NOVT + \eta_5 TIME + \eta_6 D_1 + \eta_7 D_2 + \eta_8 D_3 + \varepsilon_i \quad \dots\dots\dots (3)$$

$$NOVT = \varphi_0 + \varphi_1 INC + \varphi_2 NOVT + \varphi_3 TC + \varphi_4 DIST + \varphi_5 TIME + \varphi_6 D_1 + \varphi_7 D_2 + \varepsilon_i \quad \dots\dots\dots (4)$$

$$\delta_0, \gamma_0, \eta_0, \varphi_0 > 0; i = 1, 2, 3, \dots, 7.$$

where

- AGE = Age of Visitor (year)
- Educ = Education of Visitor (year)
- INC = Households' income (Rp/year)
- NOVT = Number of Visitor member in one visit (person)
- DIST = Distance from base of Visitor to the object of tourism (km)
- TIME = Time consuming from base of visitor to object of tourism (hour)
- D₁ = Dummy of Occupation; 1 = private sector employee; 0 = government official
- D₁ = Dummy of type of transportation; 1 = own vehicle ; 0 = public transportation
- D₁ = Dummy of facilities at target area; 1 = appropriate; 0 = not appropriate.

Data Analysis

Two stages least square was used to estimate the parameter estimates for this simultaneous travel cost model, with positive expected sign for all estimates. Similar to WTP model, TC model also showed efficient parameter estimates with respect to its explanatory variables. Either R^2 or sign and magnitude of parameter estimates indicated this condition.

RESULTS AND DISCUSSION

Parameter Estimates of Travel Cost Method

Cirata Dam at Jangari Sub District in Cianjur

Cirata Dam represent object of agro-tourism, which located at Jangari village in Cianjur District, which is belong to middle stream of Citarum river basin. Travel Cost Method (TCM) was applied to analyze economic value of number of visitors and all their activities during stay at this area. This successively was studied by designing travel cost model and analyze its parameters estimates. Result of Travel Cost (TC) parameter estimates indicate that about 74.76% of variability of visitor's TC can be explained by its explanatory variables, which is fairly good and the rest equal to 25,24% explained by other variables, which are not included in the model (**Table 1**). Visitor age have a positive effect to visitor's TC and statistically significant at level of 5%. Conversely, level of education of visitor is negatively influence the variability of visitor's TC, but is not significant even at level of 20%.

Table 1. Result of parameter estimate and elasticity on TC at middle stream, Cirata 2003.

Dependent Variable	Parameter Estimate	Standard Error	Prob > (T)	Elasticity
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Intercept	4.467979	2.81856805	-	-
Age of Visitor	1.065682	0.45529046	0.0297	0.55797
Education of Visitor	-0.428025	0.54262181	0.4395	-0.70273
Income	0.180898	0.24508043	0.4690	0.63514
Number of Visitor	0.231587	0.15438110	0.1492	0.01625
Distance from base of Visitor	0.347098	0.26933754	0.2122	0.55862
Time Consuming	0.329950	0.31813624	0.3121	0.13739
Dummy of Occupation	-1.219804	0.50659269	-	-
Dummy Type of Transportation	0.659799	0.26903420	-	-
Dummy of Facilities	-0.114296	0.24722953	-	-
R ² = 0.7476 F _{hit} = 6.581 Prob>F = 0.0002				

This Phenomenon indicates that visitor with better level of education in general they come to Cirata Dam at Jangari with a purpose to only limited for enjoying its natural beauty, non for consumptive purposes. On the contrary, visitor with lower education level, which is on generally less access to object of agro-tourism, the target to enjoy is proportional between consumptive and natural beauty. So that this phenomenon indicates that visitor's level education negatively influence its TC. Although is not statistically significant, empirical result showed that TC of visitors move in the same direction with their household's income. This condition can be explained, positive effect of visitor household's income to TC only happened at visitor with lower education level, while expense of which they have to pay is very much determined by level of its household's income.

Conversely this phenomenon is not applicable at visitor with relatively higher education. Meanwhile, number of visitor per family or per group has a positive effect to visitor's TC, which is statistically significant at level of 15%. This phenomenon is understandable, as an illustration average TC, which must be released by family with member of 5 people of course, will be more costly compared to smaller family. Although statistically is not significant at level of 20%, distance of visitor's origin positively determines TC of visitor. In other words, the longer the distance of visitor from Cirata Dam the longer time spent to go to Jangari and cause higher TC must be spend by visitor especially transportation cost.

Furthermore, elasticity value indicates that in general visitor TC less respond to change of its explanatory variables, posed by its elasticity value, which is less than one. However, although inelastic, among explanatory variables, visitor TC relatively responds to the change of visitor level of education. This condition indicates that

agro-tourism object of Jangari is mostly visited by visitor with middle or lower education.

Meanwhile, parameter estimate of dummy variable that represent type of job that comprised of non-government official vs government official indicates that TC of the first group is lower than later group. This condition in line with phenomenon that visitor of non-government official in general come from farmer family. Furthermore, parameter estimate vehicle type dummy variable indicates that visitor with personal vehicle in average spend TC about 0.66 times bigger than visitor, which is not using personal vehicle. Meanwhile, parameter estimate of visitor comments to facility dummy variable indicates that visitor with impression that facility in this area is limited will spend TC about 0.11 lower than visitor, which said conversely.

Result of parameter estimate of frequency of visit to this object of agro-tourism is presented at **Table 2**. Coefficient determination showed that about 94.38% of frequency of visit variability could be explained by its explanatory variables, which is excellence and only 5.62% by other variables that are not included in the model. Result of parameter estimate also showed that the higher the household's income of visitor the lower the visit frequency to Cirata Dam, which is statistically significant at level of 1.0%.

Table 2. Result of parameter estimates and elasticity on number of visitor in each group at middle stream, Cirata 2003.

Dependent Variable	Parameter Estimate	Standard Error	Prob > (T)	Elasticity
Intercept	0.746745	0.0251266	-	-
Income	-0.010279	0.00170861	0.0001	-0.21151
Travel Cost	-0.063207	0.01006128	0.0001	-0.13057
Distance from base of Visitor	0.001090	0.00058131	0.0742	0.07618
Time Consuming	-0.075321	0.018088831	0.0004	-0.19619
Dummy of Occupation	0.163398	0.03846507	0.0003	-
Dummy Type of Transportation	-0.146250	0.02119258	0.0001	-
Dummy of Facilities	0.062845	0.01913625	-	-
$R^2 = 0.9438$ $F_{hit} = 52.769$ $Prob>F = 0.0001$				

This phenomenon indicates that agro-tourism object of Cirata represent commodity of inferior to its visitor. In other words, visitor with higher household's income will be looking for more attractive object agro-tourism that can provide better. This situation is also supported by previous condition that Cirata Dam market segment is belong to lower economic class visitor. Furthermore, higher travel cost to Cirata Dam will cause lower frequency of visit, and this phenomenon is understandable since most of visitor to this area is coming from lower economic class.

Time spend to travel to this agro-tourism area also negatively determine frequency of visit, its meaning longer time is required to location of Jangari hence causing significant drop of frequency of visit. However, rather difficult to understand that progressively far apart to come from visitor origin to location of Jangari hence frequency of visit a little bit increases. For the case of Jangari, this phenomenon is anticipated to happen because most of visitor may be more interested to pay attention

at time to go through which is not required from aspect distance. In addition, frequently time to go through does not automatically express distance of visitor. Time to go through is likely very determined by condition of traffic and condition of road.

Elasticity value of visit frequency seems to be less respond to its explanatory variables. This is indicated by inelastic value of elasticity of visit frequency with respect to its explanatory variables. On the other hand, parameter estimate of dummy variable also indicates that frequency of visit of non-government official about 0.16 times higher compared with respondents that belong to government official. Meanwhile, dummy variable of visitor group that driving personal vehicle indicates that frequency of visit of this group is about 0.15 times lower than visitor group, which is using other type of transportation. Nevertheless, group of visitor saying that facility of this tourist area is quite complete is about 0.06 times higher the than group of visitor telling that facility is limited.

Jatiluhur Dam in Purwakarta District.

Jatiluhur Dam, which is located in Purwakarta District, is one of the most famous agro-tourism target areas in West Java. Visitor can enjoy their self by doing various activity such as fishing, jet sky, canoeing and other water based agro-tourism activities. People of Jakarta, Bandung and other nearby Districts use to visit this area during weekend and holiday. TCM is also applied to analyze factors that determine travel cost and frequency of visit or number of people in-group or family to visit Jatiluhur Dam.

Result of parameter estimates of visitor's TC at Jatiluhur Dam indicate that variability of visitor's TC can be excellently explained by its explanatory variable, that is equal to 93.72% and the rest about 6.28% explained by other variables (**Table 3**). Similar to the case of Cirata Dam at Jangari, age of visitor have a positive effect to visitor's TC, which is statistically significant at level of 15%. However, level of visitor education negativity influence visitor's TC, although is not significant at level of 20%. This phenomenon indicates that visitor with high education level visit to Jatiluhur with target of core important to see the pride of the construction of Jatiluhur Dam and the same time do refreshing with family or employees. This phenomenon is also strengthened from result of discussion with officer over there, that many visitor also

visit Jatiluhur with a purpose to do research especially from research institutions and university, which is also utilize their time break to enjoy the attractiveness of Jatiluhur Dam.

Table 3. Result of Parameter Estimate and Elasticity on TC Down Stream Equation –Jatiluhur, 2003

Dependent Variable	Parameter Estimate	Standard Error	Prob > (T)	Elasticity
Intercept	6.789804	4.10090908	-	-
Age of Visitor	0.655363	0.39187147	0.1203	0.38037
Education of Visitor	-0.599373	0.44865870	0.2064	-0.44629
Income	0.237301	0.35568336	0.5173	0.37435
Number of Visitor	0.718947	0.15751517	0.0006	0.51429
Distance from base of Visitor	-0.022692	0.20925073	0.9154	-0.24171
Time Consuming	0.345017	0.19973994	0.1097	0.61583
Dummy of Occupation	0.831397	0.30935690	-	-
Dummy Type of Transportation	0.072091	0.22347164	-	-
Dummy of Facilities	0.257628	0.17160671	-	-
R ² = 0.9372 F _{hit} = 19.895 Prob>F = 0.0001				

In general, parameter estimate of household's income variable has positive effect to visitor's TC but is not significant even at level of 20%. This condition indicates that the level of TC along with household's income of visitor anticipated going into effect only limited to at visitor of middle and low class of income. This phenomenon is in line with negative influence of education level to visitor's TC. The higher the number of people in a group of visitor causes its TC ever greater, which is statistically significant at level of 1%.

Result of visitor distance parameter estimate to Jatiluhur indicates that distance has negative effect visitor's TC, and this result is contradictive with case Cirata Dam at Jangari. This negative sign is anticipated to happen because visitor's characteristic of Jatiluhur coming from outside Purwakarta District and generally uses his or her own vehicle. In one group of visitor some times consist of some families so that if counted from component of its expense for transportation is lower compared to visitor coming from other locations to Jatiluhur using service of public vehicle. However, seen from time spend to go to this location is positively influence visitor's TC and statistically significant at level of 15%.

Furthermore, value of elasticity indicates that visitor's TC is less respond to the change of all explanatory variables. However, among these variables, visitor TC

relatively more respond to the variable of time spend to go this area. Conversely, visitor's TC does not respond to the distance of between visitor origin and Jatiluhur Dam area. This case indicates that change of variable of time go through fairly determines the variability of visitor's TC.

Parameter estimate of job type dummy variable indicates that average expenditure of visitor belong to non-government official for TC is significantly higher than visitor, which is have profession as government official. This matter indicates that visitor's characteristic to Jatiluhur, which is non-government official that consist of mostly private sector employees are belong to middle or higher economic class society. Meanwhile, parameter estimate of vehicle type dummy variable indicates that average visitors' TC that using their own vehicle is about 7.2% higher than those that using public vehicle. Meanwhile, dummy variable according to perception of visitor to availability of facility, its parameter estimate indicates that visitor expressing Jatiluhur facility is limited has TC that significantly higher than visitor expressing complete facility.

However, field condition showed that most of visitor telling facility is limited are visitor that stay over night. While visitor that telling the facility quite complete are those, which is not lodge over there. Thereby, in fact related to equipment of facility, there is no significant difference between this two groups of visitors. So that difference of visitor's TC solely caused the existence of difference of expense for accommodation, where it is of course visitor that stay over night will have higher TC. And level of there TC has different direction with its perception to the availability of equipment and facility at Jatiluhur Dam.

Result of visit frequency parameter estimate to agro-tourism object of Jatiluhur is presented at Table 4. Almost finely or about 99.29% variability of visit frequency can be explained by its explanatory variables, so that only 0.71% explaining by other variables, which is not included in the model. To visitor, in the reality object of Jatiluhur Dam represent normal goods, so that if household's income visitor increase hence its visit frequency also increase, which is statistically significant at level of 1%. Other explanatory variable such as travel cost, visitor distance to location and time

spend to reach this tourist area has negative effect to frequency of visit and significant at level of 1%.

Table 4. Result of Parameter Estimate and Elasticity on Frequency Down Stream Equation-Jatiluhur, 2003

Dependent Variable	Parameter Estimate	Standard Error	Prob > (T)	Elasticity
Intercept	0.803725	0.02834936	0.0001	-
Income	0.017211	0.00406420	0.0008	0.26625
Travel Cost	-0.237143	0.011259656	0.0001	-0.61433
Distance from base of Visitor	-0.004797	0.00073679	0.0001	-0.25774
Time Consuming	-0.098964	0.03303686	0.0096	-0.17230
Dummy of Occupation	0.482009	0.02781687	0.0001	-
Dummy Type of Transportation	-0.102277	0.02047727	0.0002	-
Dummy of Facilities	0.058698	0.01510595	0.0016	-
R ² = 0.9929 F _{hit} = 280.067 Prob>F = 0.0001				

Similar to the case of Jangari, variable of visit frequency to Jatiluhur also less respond to the change of its explanatory variables. This phenomenon shows that any change at its explanatory variables, which is not too extreme, hence can be anticipated that visit frequency to Jatiluhur will not experiencing of many change. Dummy variable of job type of visitor indicates that visit frequency to Jatiluhur of non-government official is slightly higher than group of visitor that are government official. Meanwhile, visitor group visit frequency driving their own vehicle is also slightly lower than visitor group, which do not use its own vehicle. Visit frequency of visitor that saying Jatiluhur tourist area has appropriate facility is slightly higher than visitor group telling object facility of Jatiluhur agro tourism area is still limited.

CONCLUSION AND POLICY IMPLICATION

Results of study on multi-functional roles of agricultural land that was carried out at Citarum river basin in West Java provided some insights about how important is a national program in agricultural development to prevent the conversion of fertile land for non-agricultural purposes. One may realize that the switching process from agricultural based economic development to industrial based development is a natural process as a country more and more develops. However landslide conversion of this resources at the same time also produce huge negative

externalities, which may cost higher than benefit that can be obtained from above switching process of development. The following are some conclusions and policy implication can be drawn from this result of study.

Conclusion

- (1) Two most popular water based agro-tourism destination in West Java namely, Cirata Dam and Jatiluhur Dam is just other function of its main function as the main source of water to rice field. However, Jatiluhur is significantly more attractive than Cirata. Based on this competitive advantage, more visitors can be attracted by Jatiluhur compared to Cirata. Visitor of Jatiluhur spent more money compared to visitor of Cirata that is about USD22.23 and USD11.78 in average respectively. Most of visitors of Jatiluhur are belong to middle and high-income class, while Cirata mostly visited by middle to low income class of people.
- (2) Simultaneous travel cost model exercised in this study for functional roles of Dam as water based agro-tourism yield quite good parameter estimates shown by coefficient of determination (R^2). For Cirata Dam, number of visitor in each group and age of head of this group likely determines travel cost of visitors. Meanwhile number of visitor in-group is influenced by factors such as income, distance to Cirata, time consuming and cost of travel.
- (3) Meanwhile, for Jatiluhur Dam, travel cost to visit this agro-tourism area is influenced by number of visitor in each group, time consuming, and age of head of the group. On the other hand, number of visitor seem to be determined by income, distance to Jatiluhur, time consuming, and cost of travel.

Policy Implication

- (1) The sustainability of environmental resources in relation to agricultural land is not only the responsibility of government either Central, provincial or District government but is responsibility of all communities at upstream, middle, as well as down stream. Therefore, government should attract the maximum capacity of community to participate in each program lunched to protect the environment.
- (2) Since the main source of environment degradation is the deforestation of upstream area for extensive farming, then alternatives should be provided by the local government with support from the Central Government such as: (1) reallocation of people that practices extensive farming from upstream down to more secure land; (2) low enforcement of those doing deforestation without different treatment for the actors of this damaging agricultural practices.
- (3) Government as well as community at down stream area should become a part of investment target to rehabilitate the upstream and middle stream of Citarum. For example government of DKI Jakarta must joint hand in hand with government of West Java province to solve conflicting problem at upstream of

Citarum. A lot of money invested to escape from yearly floods may not be effective since the upstream area of Citarum continuously deforested.

- (4) Economic value of the multi-functional roles of agricultural land at Citarum river basin has shown that 73.26% or about USD 2.65 billion from the total economic value is contributed by this function. In other words, the return to investment of preventing flood, soil erosion and landslide along Citarum river basin is very attractive. Therefore, government must put high priority to recover the beauty of Citarum for the benefit of next generation.

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