



Geographic information production and forest management of the regional forestry and wildlife directorate of the regional government of Madre de Dios - 2018.

Producción de información geográfica y gestión forestal de la dirección regional forestal y fauna silvestre del gobierno regional de Madre de Dios – 2018

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José Luis Alonso Fernández Vega

Master in Public Management, Universidad Cesar Vallejo, Lima, Peru, alonsofernandezvegas@gmail.com, ORCID: 0000-0001-6170-9345

ABSTRACT

The general purpose of this research is to determine whether the production of geographic information significantly influences the forest management of the Regional Directorate of Forestry and Wildlife of the Regional Government of Madre de Dios in 2018. The type of study is non-experimental, the study design is correlational and the research methods applied were hypothetico-deductive and descriptive, the study approach is mixed. The population is

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The sample was made up of 41 workers, including managers, professionals and forestry technicians, the sample being equal because it is a numerically small population. Two questionnaires were used as instruments, which were subjected to the reliability test with Cronbach's Alpha, and validated by the judgment of 03 experts, as well as an interview guide for the collection of data and information on the variables under study. The information was processed using the SPSS version 23 statistical package for social sciences. The results are presented in statistical tables and figures.

Key words: Geographic information, forest management.

RESUMEN

La presente investigación tiene como propósito general determinar si la producción de información geográfica influye significativamente en la gestión forestal de la Dirección Regional Forestal y Fauna Silvestre del Gobierno Regional Madre de Dios en el año 2018. El tipo de estudio es no experimental, el diseño de estudio es correlacional y los métodos de investigación aplicados fue el hipotético-deductivo y descriptivo, el enfoque de estudio es mixto. La población está conformada por 41 trabajadores entre directivos, profesionales y técnicos forestales, siendo igual la muestra por ser una población numéricamente pequeña, se aplicaron como instrumentos: dos cuestionarios, los cuales se sometieron a la prueba de confiabilidad con Alfa de Cronbach, y validada por el juicio de 03 expertos, así también se aplicó una guía de entrevista para la recolección de datos e información de las variables en estudio. El procesamiento de información se realizó mediante el paquete estadístico para ciencias sociales SPSS versión 23. Los resultados son presentados en tablas y figuras estadísticas.

Palabras clave: Información geográfica, gestión forestal.

INTRODUCTION

Over the last 25 years, forest management and forests have been changing in a positive way, despite the fact that the world's forest area continues to shrink due to the increase in human population, which demands more food consumption and land occupation. The interest in achieving sustainable forest management has never been as intense as it is today, where more lands are declared permanent forests, monitoring, supervision, control and planning activities have multiplied, the legal framework that safeguards the management of forest resources has come to have greater scope, biodiversity is increasingly allocated more surface areas for conservation and finally forests are meeting the demand for forest products and services (FAO, 2015). Forests are not only important for the use of timber, but also for products other than timber, such as medicinal plants, fruits, latex, gums, etc. They also play a

role in water regulation, conserve biodiversity, maintain soils and regulate the temperature of our planet Earth, which is becoming warmer and warmer due to greenhouse gases.

In the past, forest resources were managed primarily for timber and energy, i.e. firewood and charcoal, respectively. The use of forest resources was sometimes excessive, resulting in the loss of significant forest extensions. Forest harvesting management was carried out in response to international and national market demand for timber production, ignoring other important factors offered by forest ecosystems, including environmental and ecological factors, as well as environmental goods and services of primary importance, such as air and water, and the economic, social, environmental and institutional consequences (O. A. Aguirre, 2015).

According to Duncan (2006), forest management is perceived as a set of activities such as preservation, planning and use of forest resources, provided that forest production is under sustainable development management. Forest production is based on the continuous flow of wood supplied by the forest without harming its productivity.

Forest management aims to optimize the activities carried out in the forest, with the purpose of achieving sustainable development in its 3 economic, social and environmental levels (Fernandez, 2017). The exploitation of forest resources is of great importance in the economy of several regions that carry it out.

According to SERFOR, the forest cadastre is the physical inventory of forest concessions, permits and authorizations granted for the use and conservation of forests, which should include geographic and documentary information on forest resources and any act of registration related to the registry (SERFOR, 2015).

FAO (2002) (as cited in Villacorta, 2014, p. 58) notes that sustainable forest harvesting is regulated by some Latin American countries such as Peru, Bolivia, Chile and Guyana through contracts. These are considered as contractual arrangements concerning the use of public forests (use of timber and non-timber forest products, conservation and other non-consumptive uses), and the protection of forested areas that are in the public domain. Forest harvesting in the world is an activity that generates benefits to the population, employment, timber manufacturing, guarantees the care of the forest, etc.

In relation to previous national works we can mention: Sierra, Merino and Gullón (2014), conducted an article that aims to ensure the quality of the production of geographic information that is generated and distributed globally, nationally and regionally by the National Geographic Institute (IGN) of Spain. In the conclusions, the most important for the present work was taken into account, obtaining complete and updated geographic information in the database allowed improving the quality of geographic information, which in turn is consulted by consumers through geographic web services, being able to perform queries, visualizations and downloads provided by the IGN.

Based on the above theories, we can formulate the general problem: To what extent and in what way does the production of geographic information influence the forest management of the Regional Directorate of Forestry and Wildlife of the Regional Government of Madre de Dios - 2018? The theoretical justification is to establish technical challenges and technological innovations in order to contribute to the field of geographic information. The present research allows to determine and explain the influence of the production of geographic information in the forest management of the Regional Directorate of Forestry and Wildlife (DRFFS) of the department of Madre de Dios, this will serve to improve the production of geographic information in the DRFFS and contribute to decision-making in the management of forest resources in the department of Madre de Dios. Finally, the methodological justification was given, the measurement instrument will be used correctly, which is a survey validated by expert judgment. Given the above reasons, the general objective is to determine and explain the influence of the production of geographic information in the forest management of the Regional Forestry and Wildlife Directorate of the Regional Government of Madre de Dios - 2018.

MATERIALS AND METHODS

On the other hand, the approach is mixed, combining quantitative and qualitative approaches. According to Hernández (2014) points out "mixed methods represent a set of systematic, empirical and critical research processes and involve the collection and analysis of quantitative and qualitative data" (p.534). The research design is non-experimental, because the study variables will not be altered, according to (Hernández, Fernández and Baptista 2010). "Non-experimental research is that which is carried out without deliberately manipulating variables and in which only phenomena are observed in their natural environment and then analyzed", and cross-sectional; since it was carried out at a single point in time. (Hernández et al, 2006). It is also correlational, because it studies the relationship between variables in an investigation. (Hernández, Fernández, and Baptista, 2014). The method was hypothetical deductive, since the hypotheses were tested and conclusions were obtained. (Hernández et al, 2006).

A census population was used; the total population comprising 41 workers of the Regional Directorate of Forestry and Wildlife (DRFFS) who are directly involved in forestry specialists and technicians of the DRFFS was selected.

The instruments used to measure the variables were validated by expert judgment, the contents and structure of the items were verified, as well as the construct and criterion validity. To achieve the reliability of the instruments, the statistical method of cronbach's alpha was used, which gave as a result for the geographic information variable (Alpha = 0.928)

and for the forest management variable ($\text{Alpha} = 0.964$); these validations and reliability of the instruments were carried out based on the data obtained from the pilot test.

The present work is a mixed research, it is considered as techniques: The survey. With this technique it will be possible to demonstrate the hypothesis raised by collecting and obtaining data from the responses made by the worker in relation to the influence of the production of geographic information in forest management and the interview, is a technique that consists of collecting the views or assessments of officials and former officials of the entity.

RESULTS

The quantitative method was used for data collection and analysis, by means of descriptive and inferential statistics, and data processing was performed using the SPSS application.

The results of the variable production of geographic information according to the opinion of managers, professionals and technicians of the DRFFS in 2018 are shown: 85.4% perceive a very important level, 14.6% indicate an important level and 0.0% present the rest of levels, these being the following: moderately important, little importance and unimportant. In conclusion, according to the managers, professionals and technicians involved in the forestry issue of the DRFFS of the Regional Government of Madre de Dios in 2018, it presents a very important level in the production of geographic information.

The results of the dimensions of the variable production of geographic information according to the opinion of managers, professionals and technicians of the DRFFS in 2018 are appreciated, we have the following:

The technology dimension, 92.7% perceive a very important level, 7.3% indicate an important level and 0.0% present the rest of the levels moderately important, not very important and unimportant. A high percentage of respondents reported that they consider the use of technology in the production of geographic information to be very important.

In the human resources dimension, 73.2% perceive a very important level, 26.8% indicate an important level and 0.0% have the remaining levels of moderately important, not very important and unimportant.

The standards dimension, 75.6% perceive a very important level, 24.4% indicate an important level and 0.0% present the remaining levels of moderately important, not very important and unimportant.

The quality of information dimension, 92.76% perceive a very important level, 7.3% indicate an important level and 0.0% present the remaining levels of moderately important, not very important and unimportant.

According to the results of the dimensions of the variable production of geographic information mentioned above, it is concluded that all of them are considered by the

respondents with a percentage level of very important for the production of geographic information.

Table 1

Frequency distribution of geographic information production by dimension

Categories	Technological		Human Resources		Standards		Information Quality	
	F	%	F	%	F	%	F	%
Unimportant	0	0,0	0	0,0	0	0,0	0	0,0
Minority	0	0,0	0	0,0	0	0,0	0	0,0
Moderately Important	0	0,0	0	0,0	0	0,0	0	0,0
Important		7,3		26,8		24,4		7,3
Very important		92,7		73,2		75,6		92,7
Total								

The results of the forest management variable according to the opinion of forest managers, professionals and technicians of the DRFFS in 2018 are shown: 80.5% perceive a very important level, 14.6% indicate an important level, 4.9% report a moderately important level, and 0.0% present the remaining levels of little importance and no importance.

In conclusion, according to managers, professionals and technicians involved in the forestry theme of the DRFFS of the Regional Government of Madre de Dios in 2018, it presents a very important level trend in forest management, the importance of forest management allows obtaining an updated forest cadastre, planning instruments for the use of forest resources and control over those incidences occurred in the forest.

Table 2, shows the results of the dimensions of the forest management variable according to the opinion of DRFFS managers, professionals and technicians in 2018, we have the following:

In the Regulatory dimension, 75.6% perceive a very important level, 24.4% indicate an important level and 0.0% have the remaining levels of moderately important, unimportant and not important. This means that a high percentage of the people surveyed indicate that the regulations are very important for forest management, which means that management documents such as the regulation of organizations and functions (ROF) and the manual of organizations and functions (MOF) should be updated, and it is also necessary to train

personnel regarding the implementation of the Forestry and Wildlife Law 29763 and the regulations for forest management.

In terms of the forest cadastre dimension, 87.8% perceive it to be very important, 7.3% say it is important, 4.9% say it is moderately important and 0.0% say it is of little or no importance. According to the people surveyed, they consider the forest cadastre to be very important for forest management because it provides geographic information on concessions, permits, authorizations and concessions for the use of forest resources in the department of Madre de Dios.

In the planning instruments dimension, 80.5% perceive the level of importance to be very important, 14.6% say it is important, 4.9% say it is moderately important and 0.0% say it is of little or no importance. The surveys show that planning instruments are very important for forest management because they allow for the management and sustainable use of forest resources in the department of Madre de Dios.

In the control dimension, 75.6% perceive it to be very important, 12.2% say it is important, 12.2% say it is moderately important and 0.0% say it is of little or no importance. This shows that the respondents perceive forest management control as very important, because it allows the recording and monitoring of incidents in the forest such as illegal logging, forest fires, and unauthorized land use changes.

According to the results obtained on the aforementioned dimensions of the forest management variable, it is concluded that all of them are considered by a high percentage of respondents as very important for forest management.

Table 2.

Frequency distribution of forest management by dimension

Categories	Normative		Forest Cadastre		Instrument Planning		Control	
	F	%	F	%	F	%	F	%
Unimportant	0	0,0	0	0,0	0	0,0	0	0,0
Minority	0	0,0	0	0,0	0	0,0	0	0,0
Moderately Important	0	0,0		4,9		4,9	5	12,2
Important		24,4		7,3		14,6	5	12,2
Very important		75,6		87,8		80,5		75,6
Total								

The present research work has a sample of 41 workers (managers, professionals and technicians) of the DRFFS of GOREMAD, which to contrast the normality was applied the Shapiro-Wilk test, this is appropriate for small samples smaller than 50, it is also considered one of the most powerful tests to test the normality of the data.

Table 3.

Normality tests of geographic information production and forest management.

	Shapiro-Wilk	
	Statistician	gl
Geographic Information Production	,862	,000
Forest Management	,790	,000

Source: Own

According to Table 3 presents the Shapiro-Wilks normality test, it is found that for the geographic information production variable, the statistic obtained a value of 0.862 and the statistical significance (p-value=0.000), being less than 0.05. For the forest management variable, the statistic obtained a value of 0.790 and the statistical significance (p-value=0.000), being less than 0.05. In conclusion, the two variables mentioned have a p-value < 0.05, verifying that they are distributed in a non-normal way, therefore it is established to use non-parametric tests in order to analyze the causal relationship between the variables by means of Spearman's Rho coefficient.

Table 4.

Correlation of variables and dimensions

Rho of Spearman	Coefficient Production of Information Sig. Geographic (bilateral)	Cadastre Instruments		Management Control		
		Forestry	Regulatory	Forestry Planning		
		,839**	,709**	,527**	,611**	,642**
		,000	,000	,000	,000	,000

	N					
	Correlation coefficient	,449**	,412**	,410**	,259	,332*
	Sig. (bilateral)	,003	,007	,008	,102	,034
Technology	N					
	Correlation coefficient	,756**	,634**	,553**	,477**	,614**
	Sig. (bilateral)	,000	,000	,000	,002	,000
Resources Humans	N					
	Correlation coefficient	,769**	,713**	,417**	,666**	,602**
	Sig. (bilateral)	,000	,000	,007	,000	,000
Standards	N					
	Correlation coefficient	,742**	,655**	,516**	,500**	,615**
	Sig. (bilateral)	,000	,000	,001	,001	,000
Quality of Information	N					

** . Correlation is significant at the 0.01 level (bilateral). * .

Correlation is significant at the 0.05 level (bilateral).

Source: Own

Table 4 presents the correlation of the information production and forest management variables with their respective dimensions; however, for this research work, the correlation between the production variable and its dimensions with forest management is taken into account.

H1: The production of geographic information significantly influences the forest management of the Regional Directorate of Forestry and Wildlife of the Regional Government of Madre de Dios - 2018.

H0: The production of geographic information does not significantly influence the forest management of the Regional Directorate of Forestry and Wildlife of the Regional Government of Madre de Dios - 2018.

Table 5.

Cross-table between geographic information production and forest management

		Forest Management				
		Moderately			Total	
Important Production Information Geographic important	Very	Count	1			
		%	2,4%	7,3%	4,9%	14,6%
Total		Count	1			
		%	2,4%	7,3%	75,6%	85,4%
		Count				
		%	4,9%	14,6%	80,5%	100,0%

Source: Own

Table 5.

Correlation between geographic information production and forest management.

			Forest Management
Rho of Spearman	Production geographic information	of Correlation coefficient Sig. (bilateral)	,490**
			,001
N			

** . Correlation is significant at the 0.01 level (bilateral).

Source: Own

Table 5 shows that 75.6% of managerial, professional and technical workers perceive that the production of geographic information and forest management is very important; of the

total number of respondents, 31 workers believe that the production of geographic information is very important, as well as forest management.

Table 24 also shows Spearman's Rho correlation coefficient, which is 0.490, indicating that there is an average positive relationship between the two variables, with a p-value=0.001, which means that the significance level is less than 1% of standard significance (p-value<0.05), thus rejecting the null hypothesis and accepting the alternate hypothesis (H_1), obtaining sufficient statistical evidence to indicate that the production of geographic information has a very significant influence on forest management in the DRFFS of the Regional Government of Madre de Dios.

H_1 : Geographic information production technology significantly influences the forestry management of the Regional Directorate of Forestry and Wildlife of the Regional Government of Madre de Dios - 2018.

H_0 : Geographic information production technology does not significantly influence the forestry management of the Regional Directorate of Forestry and Wildlife of the Regional Government of Madre de Dios - 2018.

Table 6.

Cross-table technology and forest management

		Forest Management			
		Moderately important e	Very important e	Total important e	Total e
Technology	Important	0 0%	4,9%	2,4%	7,3%
	Very important	4,9%	9,8%	78,0%	92,7%
Total		2 4,9%	6 14,6%	80,5%	100,0 %

Source: Own

Table 26.

Correlation between technology and forest management

		Forest Management
Rho of	Correlation coefficient Sig. (bilateral)	,449**
Spearman	Technology	,001
N		

** . Correlation is significant at the 0.01 level (bilateral). Source: Own

According to the results in Table 6, 78.0% of the workers indicate that the application of geographic information production technology in forest management is considered to be very important, i.e., out of the total number of respondents, 32 workers state that geographic information production technology has a very important influence on forest management.

Table 26 shows Spearman's Rho correlation coefficient, which is 0.449, which allows us to affirm that there is a positive average relationship between the technology dimension and the forest management variable, with a p-value=0.001, meaning that the significance level is less than 1% of standard significance (p-value<0.05).05), thus rejecting the null hypothesis and accepting the alternative hypothesis (H_1), obtaining sufficient statistical evidence to indicate that technology has a very significant influence on forest management in the Regional Forestry and Wildlife Directorate of the Regional Government of Madre de Dios.

H_2 : The human resources of geographic information production significantly influences the forestry management of the Regional Directorate of Forestry and Wildlife of the Regional Government of Madre de Dios - 2018.

H_0 : The human resources of geographic information production does not significantly influence the forestry management of the Regional Directorate of Forestry and Wildlife of the Regional Government of Madre de Dios - 2018.

Table 7.

Cross table between human resources and forestry management

		Forest Management
	ModeratelyVery	Total
	Important important e	
	important e important e	

Human Resources	Important	Recuent	1	5	5	
		o %	2,4%	12,2%	12,2%	26,8%
	Very important	Recuent	1	1	28	
		o %	2,4%	2,4%	68,3%	73,2%
Total		Recuent				
		o %	2 4,9%	6 14,6%		100,0
		%			80,5%	%

Source: Own

Table 8.

Correlation between human resources and forestry management

			Forest Management
Rho of		Correlation coefficient	,519**
Spearman	Human Resources	Sig. (bilateral)	,001
		N	

** . Correlation is significant at the 0.01 level (bilateral). Source: Own

According to the results of Table 7, 68.3% of the workers indicate that the human resource of geographic information production in forest management is considered very important, i.e., of the total number of respondents, 28 workers say that the human resource of geographic information production has a very important influence on forest management. Table 8 shows Spearman's Rho correlation coefficient, which is 0.519, which allows us to affirm that there is a considerable positive relationship between the human resources dimension and the forest management variable, with a p-value=0.001, which means that the significance level is less than 1% of standard significance (p-value<0.05), thus rejecting the null hypothesis and accepting the alternative hypothesis (H_2), obtaining sufficient statistical evidence to indicate that human resources have a very significant influence on forest management in the Regional Forestry and Wildlife Directorate of the Regional Government of Madre de Dios.

H3: The standards of geographic information production significantly influences the forestry management of the Regional Directorate of Forestry and Wildlife of the Regional Government of Madre de Dios - 2018.

H0: The standards of geographic information production do not significantly influence the forest management of the Regional Directorate of Forestry and Wildlife of the Regional Government of Madre de Dios - 2018.

Table 9.

Cross-table between standards and forest management

		Forest Management				
		Moderately important	Very important	Total		
Standards	Important	0	1			
		2,4%	14,6%	7,3%	24,4%	
Standards	Very important	0	1	0		
		2,4%	0,0%	73,2%	75,6%	
Total		0	2 4,9%	6 14,6%	80,5%	100,0%

Source:

Table 30.

Correlation between standards and forest management

		Forest Management
Rho of	Standards	Correlation coefficient ,700**
Spearman	Standards	Sig. (bilateral) ,000
		N

** . Correlation is significant at the 0.01 level (bilateral).

Source: Own

According to the results of Table 9, 73.2% of the workers indicate that the standards of geographic information production in forest management are considered to be very

important, i.e., of the total number of respondents, 30 workers say that the standards of geographic information production have a very important influence on forest management. Table 30 also shows Spearman's Rho correlation coefficient, which is equal to 0.700, allowing us to affirm that there is a considerable positive relationship between the standards dimension and the forest management variable, with a p-value=0.001, which means that the significance level is less than 1% of standard significance (p-value<0.05), thus rejecting the null hypothesis and accepting the alternative hypothesis (H3), obtaining sufficient statistical evidence to indicate that the standards have a very significant influence on the forestry management of the Regional Forestry and Wildlife Directorate of the Regional Government of Madre de Dios.

Table 10.

Cross-table between quality of information and forest management

		Forest Management			
		Moderately important	Very important	Total	
Quality of information	Important	1	1	1	7,3%
	o %	2,4%	2,4%	2,4%	
Very important	5	12,2%	78,0%	92,7%	
	o %	2,4%	12,2%	78,0%	
Total		2	6	100,0	
		4,9%	14,6%	80,5%	%

Source: Own

Table 32

Correlation between information quality and forestry management

			Forest Management
Rho of Spearman	Quality of information	Correlation coefficient	,356*
		Sig. (bilateral)	,000
		N	

*. The correlation is significant at the 0.05 level (bilateral).

Source: Own

According to the results of Table 10, 78.0% of the workers indicate that the quality of information of geographic information production in forest management is considered to be of very important level, of the total respondents 32 workers state that the quality of information of geographic information production has a very important level influence on forest management.

Table 32 shows Spearman's Rho correlation coefficient, which is 0.356, which allows us to affirm that there is a positive average relationship between the information quality dimension and the forest management variable, with a p -value=0.001, meaning that the significance level is less than 1% of standard significance (p -value<0.05), thus rejecting the null hypothesis and accepting the alternative hypothesis (H_4), obtaining sufficient statistical evidence to indicate that the quality of information has a very significant influence on forest management in the DRFFS of the Regional Government of Madre de Dios.

Based on the results, the general alternative hypothesis is accepted, which establishes that the production of geographic information significantly influences the forest management of the Regional Forestry Directorate of the Regional Government of Madre de Dios. 75.6% of the managerial, professional and technical workers perceive that the production of geographic information has a positive and highly significant influence on forest management, of the total of respondents 31 workers think that the production of geographic information is very important in forest management, on the other hand, The interviewed workers point out the importance of geographic information in the allocation, monitoring and control of forest resources, which is in line with the results obtained by Vieira and Oliveira (2009), who point out that the use of geographic information is fundamental for decision making in the management and information management of forest resources. The use of technologies in the production of geographic information is perceived as very important by 92.7% of the respondents, because through computer equipment and the use of technological tools it allows better management of geographic information, and the responses of the interviewees also point to the importance of the use of technologies, especially in Geographic Information Systems. These results agree with Frau, Valenzuela, Rojas, Hernández and Guajardo (2006), who argue that Geographic Information Systems represent a powerful technological tool that is very important for generating, using, analyzing and modeling geographic information efficiently in a forestry organization, which allows achieving a lower degree of uncertainty in planning. 80.5% of the respondents perceive a very important level. Managers, professionals and technicians involved in forestry in the DRFFS consider forest management to be very important. The

importance of forest management makes it possible to obtain an updated forest cadastre, planning instruments for the use of forest resources and control over incidents occurring in the forest. On the other hand, the interviewees also point out that forest management is very important because it allows the authorities to make decisions on the use and harvesting of forest resources in a sustainable manner.

68.3% of the workers indicated that the human resource for the production of geographic information in forest management is very important, i.e., of the total number of respondents, 28 workers stated that the influence of the human resource for the production of geographic information in forest management is very important. Of those interviewed, they indicate that the cessation or rotation of the human resource that produces geographic information influences forest management because it generates accumulation of processes bringing as a consequence a nonconformity of the forest users. Indeed, Olaya (2014) points out that human resources are an important component because they interact with geographic information technologies; they are the ones who collect and enter data through an information system, which is then processed to obtain information that helps to make the right decisions and solve problems related to forest management.

78.0% of the workers indicated that the quality of the information produced in the production of geographic information in forest management is very important; of the total number of workers surveyed, 32 workers stated that the quality of information in forest management is very important. The interviewed workers state the importance of implementing and complying with guidelines that oblige personnel to generate quality information, i.e., it must be orderly, accurate, updated and relevant. Quality geographic information is a key element for planning and making informed decisions on the management, harvesting, control and monitoring of forest resources.

CONCLUSIONS

In this thesis, the influence of the production of geographic information on forest management of the Regional Forestry and Wildlife Directorate of the Regional Government of Madre de Dios was determined and explained, 75.6% (31) of the respondents perceive the production of geographic information in forest management as very important, with a Spearman's Rho of 0.490, which indicates that there is a positive average relationship between the two variables, it also indicates that 24.1% of the observed changes in the forest management variable is explained by the variation of the variable production of geographic information.

This thesis determined and explained the influence of geographic information production technologies on forest management in the Regional Forestry and Wildlife Directorate of the

Madre de Dios Regional Government, 78.0% (32) of the respondents perceive geographic information production as very important in forest management, with a Spearman's Rho of 0.449, indicating that there is an average positive relationship between the two variables. 449, which indicates that there is an average positive relationship between the two variables. It also indicates that 20.2% of the observed changes in the forest management variable are explained by the variation in the technologies for the production of geographic information.

This thesis determined and explained the influence of the quality of geographic information production in forest management of the Regional Directorate of Forestry and Wildlife of the Regional Government of Madre de Dios, which provides timely, updated and relevant information for correct and accurate decision making in the forestry field. 78.2% (32) of respondents perceive the production of geographic information as very important in forest management. This indicates that there is an average positive relationship between the two variables, which means that 13.0% of the observed changes in the forest management variable are explained by the variation in the quality of the production of geographic information.

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