

Analysis Report

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SAMPLE REPORT - Rafael Data Analysis Portfolio

Sample Characterization

The sample characterization of 277 respondents reveals diverse perspectives regarding their relationship with organic farming, willingness to pay taxes, and other demographic factors.

Category	Level	Count	Percentage
Relación con la Agricultura Orgánica	No	177	63.9
	Yes	100	36.1
Disposición a Pagar Impuestos	No	112	40.4
	Yes	165	59.6
	Administrations should subsidize	28	25.2
	Already pay enough taxes	15	13.5
	Economic constraints	28	25.2
Motivos para no Pagar	Lack of trust in administration	30	27.0
	Prefer ecological almond grove as is	4	3.6
	Prefer to use money on other things	6	5.4
	5	34	20.5
	15	33	19.9
Monto de Impuestos	25	34	20.5
	35	26	15.7
	50	27	16.3
	75	12	7.2
	Female	132	47.7
Sexo	Male	145	52.3
	14-25	34	12.3
Edad	26-35	52	18.8
	36-60	132	47.7
	61-older	59	21.3
	Baccalaureate	80	28.9
	None	7	2.5
Nivel máximo de estudios	PhD	3	1.1
	Primary	42	15.2
	Secondary	75	27.1
	University education	70	25.3
	<1000€	36	15.6
Ingresos mensuales netos	>3000€	33	14.3
	1000-2000€	98	42.4
	2000-3000€	64	27.7

A majority of 63.9% (177 individuals) do not have a relationship with organic farming, whereas 36.1% (100 individuals) affirm such a relationship. When considering their disposition to pay taxes, a notable 59.6% (165 individuals) are willing, in contrast to 40.4% (112 individuals) who are not.

Among those unwilling to pay taxes, the predominant reasons include a lack of trust in the administration (27%, 30 individuals) and economic constraints (25.2%, 28 individuals). A significant

portion, 25.2% (28 individuals), believe that administrations should subsidize the costs, while 13.5% (15 individuals) feel they already pay enough taxes. Only a small fraction, 3.6% (4 individuals), prefer the ecological almond grove to remain as is, and 5.4% (6 individuals) would rather use their money on other things.

In terms of the amount willing to be paid in taxes, there's a relatively even distribution among the categories: 20.5% (34 individuals) are willing to pay 5%, another 20.5% (34 individuals) 25%, and 19.9% (33 individuals) 15%. The willingness decreases for higher amounts, with 16.3% (27 individuals) for 50%, 15.7% (26 individuals) for 35%, and only 7.2% (12 individuals) willing to pay 75%.

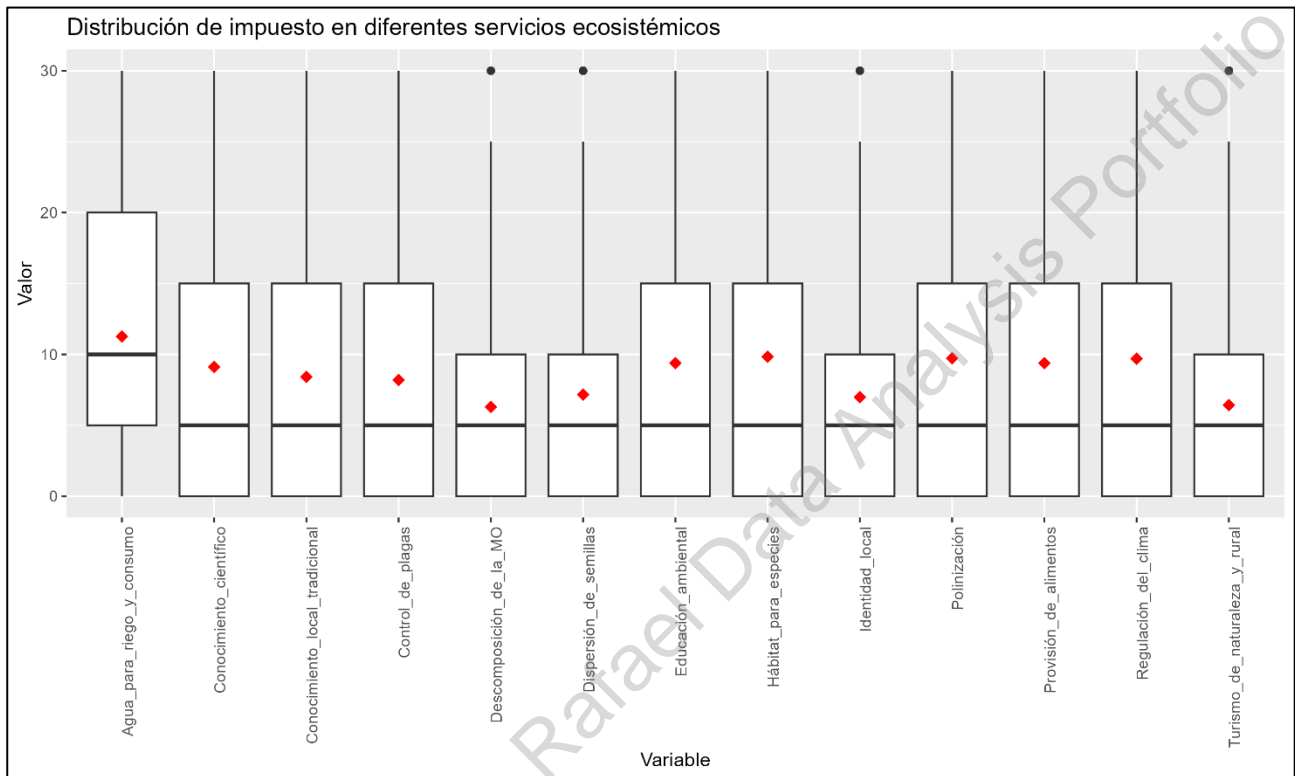
Demographically, the sample is nearly evenly split by gender, with 52.3% (145 individuals) male and 47.7% (132 individuals) female. The age distribution is skewed towards the middle-aged, with 47.7% (132 individuals) in the 36-60 age bracket, followed by 21.3% (59 individuals) who are 61 or older, 18.8% (52 individuals) between 26-35, and 12.3% (34 individuals) in the 14-25 age group.

Educational attainment varies, with the highest percentage holding a Baccalaureate (28.9%, 80 individuals). Secondary education follows closely at 27.1% (75 individuals), with university education represented by 25.3% (70 individuals). Fewer respondents have only primary education (15.2%, 42 individuals), and minimal respondents have no education (2.5%, 7 individuals) or a PhD (1.1%, 3 individuals).

Income levels show that the largest group, 42.4% (98 individuals), earns between €1000-2000 monthly. This is followed by 27.7% (64 individuals) earning €2000-3000, 15.6% (36 individuals) earning less than €1000, and 14.3% (33 individuals) earning more than €3000. This distribution indicates a moderate income level for most respondents.

Distribution of Taxes

The boxplots below shows the distribution of the amount of tax that respondents are willing to pay for various ecosystem services. Each box represents the interquartile range (IQR) of the distribution for a service, with the central line indicating the median. The red diamonds indicate the mean value of the willingness to pay for each service, offering a comparison point against the median.



From the boxplot, it appears that the median values across most services are fairly consistent, suggesting a level of agreement among the respondents about the value of these services. The means, depicted by red diamonds, are consistently above the medians for each service. This positioning of means suggests a right-skewed distribution in all categories, indicating that while the majority of respondents may prefer to pay a lower amount, there is a significant number of individuals whose willingness to pay is substantially higher, thus elevating the mean. The data points at the top of each boxplot may represent outliers or respondents with particularly high willingness to pay amounts for the respective services, indicating variability in the perceived value of these ecosystem services.

Overall, the plot suggests that while there's a general consensus on the value of ecosystem services, individual perceptions vary.

Chi-Square Analysis

The Chi-Square analysis examines the association between various categorical variables and the willingness to pay taxes among respondents. The p-values indicate the probability that the observed distribution is due to chance, with a lower p-value suggesting a more statistically significant association. Statistically significant results indicate a significant association between that pair of variables.

Variable	Level	Disposición a Pagar Impuestos		Chi Square (χ^2)	P Value
		No (%)	Yes (%)		
Relación con la Agricultura Orgánica	No	44.6	55.4	3.123	0.077*
	Yes	33.0	67.0		
Sexo	Female	41.7	58.3	0.076	0.782
	Male	39.3	60.7		
Edad	14-25	20.6	79.4	8.826	0.032**
	26-35	34.6	65.4		
	36-60	43.9	56.1		
	61-older	49.2	50.8		
	Baccalaureate	42.5	57.5		
	None	57.1	42.9		
Nivel máximo de estudios	PhD	33.3	66.7	12.207	0.032**
	Primary	57.1	42.9		
	Secondary	41.3	58.7		
	University education	25.7	74.3		
	<1000€	58.3	41.7		
Ingresos mensuales netos	1000-2000€	40.8	59.2	9.340	0.025**
	2000-3000€	34.4	65.6		
	>3000€	24.2	75.8		

For "Relación con la Agricultura Orgánica," individuals without a relationship to organic farming exhibit a nearly even split in their willingness to pay taxes, with 44.6% not willing and 55.4% willing. Conversely, those with a relationship show a higher inclination to pay, with 67% willing. The Chi-Square (χ^2) value of 3.123 with a p-value of 0.077 suggests a marginal significance.

Gender does not show a significant association with the willingness to pay taxes, as indicated by a χ^2 value of 0.076 and a p-value of 0.782. The percentages for both females and males are relatively balanced, with a slight leaning towards willingness to pay in both groups.

Age presents a notable divergence, where the youngest age group (14-25) shows a prominent willingness to pay at 79.4%, which is substantially higher than the other age groups. This is statistically significant with a χ^2 value of 8.826 and a p-value of 0.032, indicating that younger individuals are more inclined to contribute to ecosystem services through taxes.

The variable "Nivel máximo de estudios" (maximum level of education) also demonstrates a statistically significant association with tax willingness, with a χ^2 of 12.207 and a p-value of 0.032. Individuals with a university education are markedly more willing to pay (74.3%) compared to those with primary education or none (42.9% willing).

Income levels show a clear trend where individuals with higher incomes are more willing to pay taxes, with 75.8% of those earning over €3000 per month willing to contribute. This is in contrast to those earning less than €1000, where only 41.7% are willing. The χ^2 statistic of 9.340 and a p-value of 0.025 further underline the significance of this trend.

Overall, the analysis elucidates that age, education, and income levels are significantly associated with the willingness to pay taxes for ecosystem services, while the relationship with organic farming shows a possible trend, and gender appears to have no significant effect. These results underscore the importance of considering demographic characteristics when understanding and predicting tax-based contributions to environmental initiatives.

Probit Regression Model

The probit regression model provides insight into the factors that influence the likelihood of individuals' willingness to pay taxes for ecosystem services. The model's overall fit is statistically significant, $X^2(13) = 29.271$, $p < 0.01$. This suggests that the predictors as a whole reliably distinguish between individuals who are willing and not willing to pay taxes. McFadden's R^2 value of 0.094, while relatively low, still indicates that a modest proportion of the variance in the willingness to pay is explained by the model (9.4%). The table below shows the model coefficients with Odds Ratios. Odds Ratios indicate the increase on the likelihood that an individual belonging to that Predictor is willing to pay taxes.

Predictor	Coefficients	Odds_Ratios	P_Values
(Intercept)	-0.084	0.919	0.857
Relación_con_la_Agricultura_Orgánica - Yes	0.645	1.905	0.001***
Sexo - Male	-0.015	0.985	0.936
Edad - 26-35	-0.398	0.672	0.276
Edad - 36-60	-0.663	0.515	0.038**
Edad - 61-older	-0.549	0.578	0.170
Nivel_máximo_de_estudios - Baccalaureate	0.350	1.419	0.312
Nivel_máximo_de_estudios - None	-0.068	0.934	0.914
Nivel_máximo_de_estudios - PhD	0.563	1.757	0.500
Nivel_máximo_de_estudios - Secondary	0.526	1.692	0.100*
Nivel_máximo_de_estudios - University education	0.704	2.021	0.053*
Ingresos_mensuales_netos - 1000-2000€	0.154	1.166	0.570
Ingresos_mensuales_netos - 2000-3000€	0.327	1.387	0.304
Ingresos_mensuales_netos - >3000€	0.655	1.925	0.076*

Having a relationship with organic farming the likelihood of being willing to pay taxes (coefficient = 0.645), with an odds ratio of 1.905, which is statistically significant ($p = 0.001$). This shows that those with a relationship to organic farming are nearly twice (1.905) as likely to be willing to pay taxes compared to those without such a relationship.

Gender is not a significant predictor of the willingness to pay taxes, as its p -value is 0.936.

Age appears to be a significant factor for the "36-60" age group (coefficient = -0.663, $p = 0.038$), indicating that individuals in this age range are less likely to be willing to pay taxes compared to the reference age group (the group that is not showing in the table – younger than 26). The other age groups are not significantly different from the reference group.

Education level shows that "University education" has the highest coefficient (0.704) and odds ratio (2.021), suggesting a significant tendency towards willingness to pay taxes ($p = 0.053$) compared to those with Primary education.

Those earning more than 3000€ are more likely to be willing to pay taxes compared to the lowest income group ($p = 0.076$).

In summary, the probit model indicates that the relationship with organic farming and certain age, education levels and income levels are significant factors in predicting the willingness to pay taxes for ecosystem services.