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Religious Attitudes Towards Ethical Problems in the Greenhouse Vegetable Cultivation in Türkiye

Türkiye'de Örtüaltı Sebze Yetiştiriciliğinde Etik Sorunlara Yönelik Dini Tutumlar

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Religious Attitudes Towards Ethical Problems in the Greenhouse Vegetable Cultivation in Türkiye

Abstract

The main purpose of this study is to determine the level of influence of religious sensitivity regarding the ethical problems of greenhouse vegetable cultivation and to investigate the possibility of religious contribution to the solution of ethical problems arising on the ground of greenhouse cultivation. Religious sensitivities of greenhouse vegetable growers, where physical conditions are controlled and industrial production is dominant, were analyzed through main categories such as daily life and religion, pesticides and health, genetics and nature. The study aims to provide a background reading of specific moral issues in the context of religious sensitivity analysis.

The data were collected by means of questionnaires arranged in accordance with the purpose, by interviewing 430 producers growing vegetables in greenhouses within the borders of Antalya province located in the Mediterranean Region of Turkey. An index was created to analyze the religious mentality of greenhouse vegetable growers and to show their religious sensitivity levels in solving ethical problems. The characteristics of the producers, their attitudes and behaviors in the production process are known as the factors that affect the religious sensitivity towards the ethical problems of greenhouse vegetable cultivation. These factors were tested with a multiple linear regression model whose dependent variable was the religious sensitivity index.

Producers who think that they are praying while doing their work in the greenhouse vegetable production process and quit their job to perform the Friday Prayer have been found to be more religiously sensitive to ethical issues than other producers. Religion was found to be important in the daily lives of the producers and it was stated that religion affected behaviors on the basis of mentality. The level of religious sensitivity was determined to be quite high, that a mistake they made in greenhouse vegetable growing activities would be punished not only in the hereafter but also in this world. This situation shows that in order to overcome the ethical problems in greenhouse vegetable cultivation, the strategies to be followed should be considered within the religious framework. In the linear regression model, it can be said that the producers with high school and undergraduate education levels have higher religious sensitivity to the ethical problems of greenhouse vegetable cultivation compared to the producers with primary education level. Certain experiences of greenhouse vegetable growers may be linked to their general religious attitudes. In this respect, it can be said that the religious sensitivity of the producers, who have been doing greenhouse cultivation for a long time, towards ethical problems is more important than the less experienced ones.

The religious sensitivity index for greenhouse vegetable cultivation is the first in the literature. The religious sensitivity index, whose relationships are analyzed in the form of daily life and religious perception, genetics and nature, greenhouse vegetable production and the hereafter, chemical spraying and health, non-compliance with the spraying time and seeing the return in life, moral consistency and market conditions, seems to have the potential to guide further studies.

Key Words: Sociology of Religion, Greenhouse, Vegetable Cultivation, Ethical Problems, Linear Regression Model.

Türkiye'de Örtüaltı Sebze Yetiştiriciliğinde Etik Sorunlara Yönelik Dini Tutumlar

Öz

Bu çalışmanın temel amacı, sera sebze yetiştiriciliğindeki etik sorunlara ilişkin dinsel duyarlılığın etki düzeyini belirlemek ve sera yetiştiriciliği zemininde ortaya çıkan etik sorunların çözümüne dini katkının imkanını araştırmaktır. Fiziki şartların kontrol edildiği ve endüstriyel üretimin hâkim olduğu sera sebze yetiştiriciliğinde dinsel duyarlılıklar gündelik hayat ve din, ilaçlama ve sağlık, genetik ve fitrat gibi ana kategoriler üzerinden analiz edilmiştir. Bu anlamda çalışma, dinsel duyarlılık çözümlemesi bağlamında spesifik ahlaki sorunların bir arka plan okumasını amaçlamaktadır. Zira toprak ve insan ilişkisi, toprağı kullanma ve çiftçilik mesleğı, tarımsal dönüşümler ve gelişmişlik, makineleşme ve modernlik, teknolojik dönüşüm ve toplumsal farklılaşmalar, etik ve gündelik gerçeklik, tüketim ve sağlık gibi kavramsallaştırmalar, kırsal yaşam ve çiftçilik mesleğinin hem insanlık tarihinde oynadığı role hem de çiftçilik mesleğinin dönüşümüne ve toplumsal farklılaşmayı anlamadaki önemine işaret etmektedir.

Veriler, Türkiye'nin Akdeniz Bölgesi'nde yer alan Antalya ili sınırları içinde serada sebze yetiştiren 430 üretici ile karşılıklı görüşülerek, amaca uygun olarak düzenlenmiş anket formları aracılığıyla toplanmıştır. Sera sebze yetiştiricilerinin dinsel zihniyetini analiz etmek ve etik problemlerin çözümünde ilişkin dinsel duyarlılık düzeylerini gösteren endeks oluşturulmuştur. Üreticilerin karakteristikleri, üretim sürecindeki tutum ve davranışları; sera sebze yetiştiriciliği etik sorunlarına karşı gösterilen dinsel duyarlılığı etkileyen faktörler olarak bilinmektedir. Bu faktörler, bağımlı değişkeni dini duyarlılık endeksi olan çoklu doğrusal regresyon modeli ile test edilmiştir.

Sera sebze üretim sürecindeki işlerini yaparken ibadet yaptığını düşünen ve Cuma Namazını kılmak için iş bırakan üreticiler, diğer üreticilere göre etik sorunlara dinsel duyarlılığı daha fazla bulunmuştur. Üreticilerin, gündelik hayatlarında din önemli bulunmuş ve dinin zihniyet temelinde davranışları etkilediği ifade edilmiştir. Sera sebze yetiştiriciliği faaliyetlerinde yaptıkları bir hatanın sadece ahirette değil bu dünyada da karşılığının görüleceğine yönelik dinsel duyarlılık düzeyi oldukça yüksek ölçülmüştür. Bu durum, sera sebze yetiştiriciliğinde etik sorunların üstesinden gelebilmek için izlenecek stratejilerin dinsel çerçevede ele alınması gerektiğini göstermektedir. Doğrusal regresyon modelinde, ilköğretim eğitim düzeyine sahip üreticilere göre lise ve lisans eğitim düzeyi olan üreticilerin sera sebze yetiştiriciliği etik sorunlarına karşı dinsel duyarlılıklarının daha yüksek olduğu söylenebilir. Sera sebze yetiştiriciliği yapan üreticilerin, belirli deneyimleri genel dinsel tutumlarıyla bağlantılı olabilmektedir. Bu açıdan, uzun süredir seracılık yapan üreticilerin daha az deneyimlilere göre etik sorunlara yönelik dinsel duyarlılığının önemli olduğu söylenebilir.

Sera sebze yetiştiriciliği özelinde dinsel duyarlılık endeksinin çıkartılması, literatürde ilk olma özelliğini taşımaktadır. Gündelik hayat ve din algısı, genetik ve fitrat, sera sebze üretimi ve ahiret, kimyasal ilaçlama ve sağlık, ilaçlama zamanına uymama ve hayattayken karşılığını görme, ahlaki tutarlılık ve piyasa şartları şeklinde ilişkileri analiz edilen dinsel duyarlılık endeksi daha sonraki çalışmalara rehberlik etme potansiyeline sahip gözükmektedir.

Anahtar Kelimeler: Din Sosyolojisi, Sera, Sebze Yetiştiriciliği, Etik Sorunlar, Doğrusal Regresyon Modeli.

Introduction

Greenhousing is a production activity where production conditions are controlled and maximum production can be made from a smaller area compared to traditional agriculture. Generally, two applications come to the fore in the context of food safety in greenhouse vegetable growing activities. The first of these is the practice of agricultural spraying; the second is seed breeding. Food safety and ethical issues in greenhouse vegetable cultivation, each stage of which is transformed into industrial production, are constantly on the agenda and discussed in terms of public health. Cardoso and James¹ list the examples they call controversial practices in agricultural production as follows: Chemical fertilizers, pesticides and herbicides, planting genetically modified crops. In another study, ethical issues in agriculture are discussed in the following main points: food safety, technological change and agricultural production techniques, pollution and environmental sustainability, corruption of regulators and policymakers.² Ethical issues such as the application of biotechnology to food products, genetic modification of plants, and large-scale agricultural technologies need to be analyzed both structurally and sociologically.³ Human-centered problems, such as the use of harmful drugs, violating safe food rules, and the preferences of political decision-makers, are behavioral and can be evaluated according to generally accepted social principles.

These scopes in greenhouse vegetable cultivation include certain rules and temporal regulations and require scientific and technological solutions to ensure safe food. These scopes in greenhouse vegetable cultivation include certain rules and temporal regulation and require scientific and technological solutions to ensure safe food. The Ministry of Agriculture and Forestry and other relevant public institutions contribute to the sustainability of production processes in line with the relevant legislation. Especially in the production process, if the pesticides licensed and recommended by the Ministry of Agriculture and Forestry for diseases and pests are applied on time and at the appropriate dose; if the waiting period is observed, the products can be harvested and put on the market without chemical residues. In addition, public institutions and organisations have the authority to carry out residue analyses at regular

¹ Sarika P. Cardoso - Harvey S. James, "Ethical Frameworks and Farmer Participation in Controversial Farming Practices", *Journal of Agricultural and Environmental Ethics* 25/3 (2012), 377-404.

² Harvey S. James, "On Finding Solutions to Ethical Problems in Agriculture", *Journal of Agricultural and Environmental Ethics* 16 (2003), 439-457.

³ Saamer K. Alhamidi et al., "A Study of the Traditional Farming System in the Ghouta, Oasis of Damascus, Syria", *Agriculture and Human Values* 20 (2003), 231-240.

intervals by the relevant ministry at production sites and fruit and vegetable markets and to impose penal sanctions in case of residues above the limit values.⁴ At this point, the human element, more specifically, the religious mentality (morality and ethics) of the human being is neglected in terms of safe food or it is thought that it does not affect the production process. On the contrary, religion-based beliefs and rituals are at the forefront of the determining factors in the daily lives of greenhouse vegetable producers.

These provide moral and behavioral patterns of personal and social life.⁵ From this perspective, it is very difficult to separate the production culture and religion formed within the framework of greenhouse vegetable cultivation. When the problem of food safety and human relations arise, the following emphasis is made to solve the problem: Less chemical use, suggestions that pollute the air and the environment less. However, the human element becomes more important in the production of safe food and the solution of ethical problems due to the ethical dilemmas of the producers, which are expressed as theory and practice, what should be and what is happening, ideal and reality versus value conflict. Ethical dilemmas arise when we have to choose between two or more negative options. The reasons that lead the farmers to dilemmas are the fact that the producers who produce by constantly borrowing from seed companies and dealers in greenhouse vegetable cultivation cannot be willing to gain fewer products for healthier products and that they aim to compensate their losses by panicking in cases where they cannot obtain efficient products. On the other hand, some problems show the human-centered dimensions of the problem. The main ones that come to mind are as follows: Although a certain time interval is required between (*pesticide*) spraying and harvesting, this period is not followed to gain more profit; the inability to abandon intensive fertilization, which pollutes water and soil resources, in the name of maximum profit; the fact that manufacturers do not put the question of whether to do the profitable thing or do the technically correct thing on their agenda and the inability to produce a policy for the level of religious sensitivity in greenhouse cultivation.⁶

Pesticides in greenhouse vegetable cultivation, seed improvement, the effect of religion in daily life, religious sensitivity towards ethical problems that arise within the framework of seeing the error made in production activities in this world and the hereafter are examined. It aims to determine the religious sensitivity and awareness levels of the producers' attitudes and behaviors related to these practices and production. In other words, this study is aimed both to discover the relationship established with God in a place where climatic conditions can be controlled and to analyze religious sensitivity in safe food production. The concept of religious sensitivity, which includes a cultural and daily life-centered perspective, has been used for attitudes with Islamic references. In greenhouse cultivation, the social constructivist perspective produced by the relationship between culture, religion and agriculture has been accepted. Sub-determining factors such as sectarian or anti-religious, which are the reflection of religious,

⁴ Türk Gıda Kodeksi Pestisitlerin Maksimum Kalıntı Limitleri Yönetmeliği (TGKPLY), Resmî Gazete 31611 (Eylül 27, 2021).

⁵ Anthony Giddens, *The Consequences of Modernity* (Stanford University Press: Polity Press, 1994), 95; Ruth A Wallace Alison Wolf, *Çağdaş Sosyoloji Kuramları*, çev. Leyla Elburuz - M. Rami Ayas (Ankara: Doğu Batı Yayınları 2012), 381-389; Necdet Subaşı, *Gündelik Hayat ve Dinsellik* (İstanbul: İz Yayıncılık, 2004), 41-44; Fazlı Polat, *Gündelik Yaşam Tercihleri ve Din* (Ankara: Sage Yayınları 2013), 1-6; Mustafa Macit, "Din Kavramıyla İlgili Anlayış ve Tutumlar Üzerine Bir Çözümleme", *EKEV Akademi Dergisi* 4 (2009), 348-349; Mustafa Arslan, "Gündelik Hayatta Din", *Din Sosyolojisi El Kitabı*, ed. Niyazi Akyüz - İhsan Çapcıoğlu (Ankara: Grafiker Yayınları, 2012), 307-324.

⁶ Burçin Çokuysal, "Sürdürülebilir Tarım ve Gıda Üretiminde Etik İnkilemleri Anlamanın ve Tartışmanın Önemi", *Türkiye Biyoetik Dergisi* 7/3 (2020), 114-123.

philosophical, or ethical discussions, are excluded from the scope of the subject.⁷ Therefore, in the study; the relationships in the form of daily life and religious perception, genetics and nature, greenhouse vegetable production and the hereafter, pesticide spraying and health, non-compliance with the spraying time, and seeing the return in life, moral consistency and market conditions were analyzed. In this respect, the study can also be considered as a background reading of specific moral problems in the context of holistic religious sensitivity. It is expected that this study will contribute to the healthier execution of agricultural activities such as management-production-planning, bringing religious sensitivity to both farmers, and the solution of ethical problems by bringing religious sensitivity to the forefront in greenhouse vegetable cultivation.

1. Methods and Materials

1.1. Data Collection

The primary data for this study is necessary to analyze the multifaceted effects of the producers' religious sensitivities and related socio-demographic and producer characteristics on the ethical problems encountered in greenhouse vegetable cultivation practices at the level of agricultural enterprises engaged in greenhouse vegetable cultivation. For this reason, primary data were obtained from producers who are directly involved in greenhouse vegetable cultivation at the agricultural enterprise-level and are in a decision-making position in the province of Antalya, which is located in the Mediterranean Region of Turkey, where greenhouse vegetable cultivation is carried out intensively. For these data, a questionnaire was prepared that includes the religious attitudes of the producers about the greenhouse vegetable cultivation practices and the producer characteristics. For the survey, a stratified random sampling method was applied, taking into account the budget constraint, to reach more accurate and reliable data with less expense, assuming that the resources are scarce. In addition, the proportional distribution approach, which is based on distributing the sample proportionally to the strata volumes, was used. Considering the costs in proportional distribution, the sample size was calculated as 430. The data were obtained by completing a questionnaire conducted in the spring of 2019 by face-to-face interviews with greenhouse vegetable growers in the research region. For the reliability of the questionnaire, a pre-test (pilot) study was conducted with 50 producers before applying the questionnaire. The survey is based on a randomly selected sample of producers aged 18 and over.

Experts in the sociology of religion, agricultural economics, and scale development were used in the preparation of the questionnaire. For the survey, firstly, 10 judgment items including the religious attitudes of the producers to the ethical problems in greenhouse vegetable cultivation practices were prepared within the framework of expert opinions. Afterward, a pilot application was made for the questionnaire, and the scale's judgment-item compatibility and internal consistency were examined. In this framework, the number of scale judgment items was reduced to 9 (Table 6). Farmers wishing to comment on each of the ethical issues of greenhouse vegetable cultivation were asked to rank the relative importance of each religious judgment on a five-point Likert scale (Rm). These Likert scale ranks were then converted into weighted scores (Wq). Zero weight is given for judgments for which the producer does not express an opinion. Then, the overall VAI for each farmer is calculated by adding the weighted scores for

⁷ Richard Baer, "Agricultural Ethics at State Universities: Why No Input from the Theologians?", *Agriculture and Human Values* 2/4 (1985), 41-46; Michael Eldridge, "Theology and Agricultural Ethics in the State University: A Reply to Richard Baer", *Agriculture and Human Values* 2 (1985), 47-53; Richard Baer, "Theology and Agricultural Ethics at State Universities: A Rejoinder", *Agriculture and Human Values* 6/3 (1989), 99-104.

each religious judgment and then dividing the total religious sensitivity by the number of judgments (Table 1). Thus, an index of religious sensitivity awareness of producers to the ethical problems of greenhouse vegetable cultivation is established (VAI).

Table 1. Religious Sensitivity Index for Greenhouse Vegetable Growing Ethical Problems⁸

Opinion on the jth impact	Disagree	Agree				
Impact value (Vj)	0	1				
The rank of the importance of jth impact on a five-point scale (Rm)	0	1	2	3	4	5
Rank interpretation	None	Very low	Low	Medium	High	Very high
Weights (Wq)	0	0.2	0.4	0.6	0.8	1.0
Aggregate Sensitivity Index of the ith of farmer (AAIi)	$\sum_{j=1}^n \sum_{m=0}^5 \sum_{q=0}^1 VRW_{jmq}, \quad \forall j; = 1, 2, \dots; m = 0, 1, \dots, 5; q = 0, 0.2, \dots, 1. (1)$					
Overall greenhouse vegetable growing ethico-religious sensitivity index of the ith of farmer (VAIi)	$\frac{AAI_i}{N}, \text{ where } N = 11 (\text{total number of impacts}). (2)$					

1.2. Data Analysis Methods: The regression model

A Multivariate linear regression model analysis was adopted to develop a model that identifies the current situation and determines religious sensitivity to the ethical issues of greenhouse vegetable cultivation. Because, when the dependent variable data in the model is continuous and does not contain 0 values, the linear regression model should be preferred.⁹ The linear regression model is simply as follows; $y_i = x_i' \beta + \varepsilon_i$ ($i = 1, 2, \dots, n$) **(1)**

y_i is a continuous variable that indicates the religious sensitivity of the producers to the ethical issues of greenhouse vegetable cultivation. x_i is an independent variable vector expressing the behavior, religious attitudes, and characteristics of farmers regarding greenhouse vegetable growing activity. β is the unknown parameter vector, and ε_i is an independent, assumed normal distribution term with constant variance σ and a mean of zero.

In the linear regression model, seven explanatory variables that are thought to affect the religious sensitivity to the ethical problems of greenhouse vegetable cultivation were included. Three of these explanatory variables reflect the individual characteristics of the producer. The other two characterize the religious attitudes of the producers, while the remaining two reflect the behaviors towards the greenhouse vegetable cultivation spraying application. The linear regression model is therefore specified as a function of individual, religious, and greenhouse vegetable crop spraying application variables:

$$VAI = \alpha_0 + \beta_1 EDU + \beta_2 EXP + \beta_3 SEX + \beta_4 FRID + \beta_5 WORS + \beta_6 PEST + \beta_7 HARV + \varepsilon \quad \mathbf{(2)}$$

The dependent variable VAI is continuous, indicating the religious sensitivity of producers to the ethical problems of greenhouse vegetable cultivation. Only (EDU) and (EXP) variables included in the model are categorical, other variables are dummy variables.

⁸ Sanzidur Rahman, "Environmental Impacts of Modern Agricultural Technology Diffusion in Bangladesh: An Analysis of Farmers' Perceptions And Their Determinants", *Journal of Environmental Management* 68 (2003), 183-191.

⁹ Damador N. Gujarati, *Basic Econometrics* (New York: McGraw-Hill Companies 2004), 203.

With the (FRID) and (WORS) dummy variables, it was aimed to determine the effect of the behavioral types of the producers on religious sensitivity while performing greenhouse vegetable cultivation. On the other hand, (PEST) and (HARV) dummy variables were used to determine the effect of producers on religious sensitivity to pesticide usage behavior ethical problems in greenhouse vegetable cultivation. In addition, the dummy variable (SEX) was included in the model to see how much the gender of the agricultural business manager differentiates the religious sensitivity to the ethical problems of greenhouse vegetable cultivation. Variables (EDU), (EXP), (FRID), (WORS), and (HARV) are expected to increase religious sensitivity to greenhouse vegetable growing ethical issues, while (PEST) variable is expected to decrease (Table 2).

Table 2. Definition and a priori Expected Signs of Variables Used in the Model

Dependent Variable		
VAI	Religious sensitivity index for greenhouse vegetable cultivation ethical problems (Mean = 0.776, Std. Dev. = 0.087, Min. = 0.40, Max. = 0.96)	
Explanatory variables	Descriptions	Expected sign
EDU1*	1 if the producer's education level is primary education, 0 otherwise.	-/+
EDU2	1 if the producer's education level is high school, 0 otherwise.	+
EDU3	1 if the producer's education level is the university, 0 otherwise.	+
EXP1*	1 if the producer has been growing greenhouse vegetables for 1-5 years, 0 otherwise.	+
EXP2	1 if the producer has been growing greenhouse vegetables for 6-10 years, 0 otherwise.	+
EXP3	1 if the producer has been growing greenhouse vegetables for 11-15 years, 0 otherwise.	+
EXP4	1 if the producer has been growing greenhouse vegetables for 16-+ years, 0 otherwise.	+
SEX	1 if the head of the household head is male and zero, otherwise	+/-
FRID	1 if the producer halts the greenhouse vegetable production business for Friday Prayer, 0 otherwise.	+
WORS	1 if the producer thinks that s/he is worshipping while doing greenhouse vegetable production works, 0 otherwise.	+
PEST	1 if the producer uses pesticides that harm human health to prevent loss of income, 0 otherwise.	-
HARV	1 if the producer pays attention to the harvest times while spraying the vegetable plants, 0 otherwise.	+

* Referent group

2. Results and Discussion

2.1. Socio-demographic Characteristics

In Table 3, the variables of the participants' gender, age, education, annual income, year of agricultural activity, reciting *Bismaillah* at the beginning of work (in the name of God - throughout the article, God will be used instead of *Allah*) and behavior during the call to prayer in connection with agricultural activity are given. The numerical superiority of men over women in farming is remarkable. In this respect, the numerical scarcity of women can be explained by both the structural characteristics of farming and the tradition of society. According to the gender variable, 30.93% of the participants are women and 69.07% are men. In terms of giving the general characteristics of the farming profession regarding the age variable, the highest rate was 27.91% with the age range of 41-50, while the second rank was 51-60 years with 22.56%. As seen in Table 3, the point that draws attention from the age distribution is that each age group is engaged in the farming profession. In terms of the education variable, 52.56% of our sample

consists of primary school and secondary school graduates, 26.05% of high school graduates, and 21.40% of undergraduate graduates. In this sense, there is a balanced distribution in the education variable as in the age variable. The rate of those who earn 20,000 TL annually as their income from greenhouse cultivation is 30%; the ratio of those with an income of more than 61.000 TL was measured as 23.95%. In terms of reflecting the agricultural tradition, 61.40% of our participants declared that they have been doing this work for more than 16 years in the greenhouse activity year.

In the *Bismillah* (*in the name of God*) variable, which is applied in religious culture as the mention of God's name when starting a task with the intention of prayer, 66.98% of the participants answered always and 23.26% rarely. Starting a task with *Bismillah*, a discourse that emerges from the relationship of religion with culture has been measured as a 99.08% practiced behavior, albeit in different tones. 48.60% of the farmers during the call to prayer, which we addressed to the participants as an important parameter for religion-culture or religion-mentality analysis, answered that *they would take a break from work and listen*. This was followed by 23.49%, I would just say, "Dear God," and continue my work, with 12.33%, I would quit my job and pray, with 8.37%, I would sometimes sit and listen to the call to prayer and continue my work with 6.05%. All these behaviors exemplify the cultural forms of religious life in this society. Although there are differences in the formal practices of religion, religious symbols have a special place in the culture of the country. The most important of these symbols is the *adhan* (the call to prayer), which appears as an identity indicator.

Table 3. Basic Socio-Demographic and Religious Belief Information of Producers

Variable	Frequency (%)	Variable	Frequency (%)
Sex (%)			
Men			69.07
Women			30.93
Age (%)		Experience (%)	
18-30 years old	18.14	1-5 years	12.79
31-40 years old	21.16	6-10 years	13.95
41-50 years old	27.91	11-15 years	11.86
51-60 years old	22.56	> 16 years	61.40
60 years and older	10.23	Say Bismillah (%)	
Educational level (%)		Never	0.93
Elementary	52.56	Rarely	8.84
High school	26.05	Often	23.26
Higher education	21.40	Always	66.98
Household annual income (%)		During the call of adhan (%)	
< 20 000 TRY	30.00	Continue my work	6.05
21 000-40 000 TRY	28.60	Take a break from work and listen	48.60
41 000-60 000 TRY	17.44	Quit my job and pray	12.33
>61 000 TRY	23.95	Say "Dear God," and continue my work	23.49
		Sometimes sit and listen	8.37
		Other	1.16

2.2. Religious Sensitivity to Ethical Problems in Vegetable Growing

The scale for identifying ethical problems consists of three sub-categories. The scale analyzes religious sensitivity regarding ethical problems through sub-categories such as the perception of daily life and religion, the religious background of the relationship between pesticides and health, and the relationship between genetics and nature.

Religious sensitivity in the relationship between daily life and religion perception: To measure the background of the participants' religious sensitivity regarding ethical problems, religious sensitivity judgments regarding the relationship between daily life and religion were included. In this sense, religious sensitivity was determined at a rate of 0.873 for the judgment that "religion covers the whole of life, including greenhouse-vegetable production", for the religious background of the religious sensitivity scale for ethical problems and the general religious sensitivity of the sample (Table 4). This perception of religion in daily life seems to be decisive for all cultivation practices such as using pesticides, complying with the (pesticide) spraying time, being honest despite adverse market conditions, believing that the greenhouse vegetable cultivation practices will be rewarded in the world and the hereafter, and whether or not to gain moral sensitivity towards the improvement of seeds and genetic modification.

It is observed that two points come to the fore in the relationship of religions with agricultural activities based on this daily life: The deep relationship established by ancient traditional religions with culture, such as chanting mawlid, praying for rain, praying while planting saplings in maintaining agricultural activity; the use of new technologies, seed breeding, and innovations such as agricultural insurance is encouraged through religious legitimacy.¹⁰ The culture to which the farmers are attached is analyzed from the perspective of daily life and religion, which legitimizes traditional agricultural practices and new technological changes.¹¹ In the perspective of everyday life, each religion, on the one hand, undertakes some roles in maintaining the established order in society and on the other hand, demands to change this order in the universe of higher consciousness and belief. This shows that religions play essential roles in conditions favorable to both change and stagnation. For this reason, the influence of religion on the social life of humanity, the harmony of groups, and its determinants in the differentiation of attitudes and social structure cannot be ignored.¹² Worships (mawlid, prayer, etc.) are practiced both individually and socially, and the emphasis on exemplary practice is strengthened. Religiously based beliefs and rituals provide security for their daily life experiences and interests. From the point of view of daily life, religions provide the moral and behavioral patterns of personal and social life in the context of the symbol of the created security environment by assuming intense security roles.¹³ It can be said that this high level of religious sensitivity, which covers the whole life of religion, including greenhouse vegetable cultivation, refers to the deep relationship expressed as agriculture-culture-tradition, and also creates legitimacy for the technological innovation applied in greenhouse vegetable cultivation.

The highest religious sensitivity towards ethical problems in vegetable growing was found to be 0.895, in the judgment that "people will be taken into account not only for their worships but also for the correctness of their vegetable production tasks" (Table 4). The belief in the hereafter, which expresses life after death in religious literature, organizes daily life with reward and punishment. In the Islamic belief system, the belief in the Hereafter states that the good and evil done in this world will be rewarded even if it is an atom's size (al-Qur'an 99/7-8)¹⁴. In other

¹⁰ Alhamidi et al., "A Study of the Traditional Farming System in the Ghouta, Oasis of Damascus, Syria", 231–240.

¹¹ For the Relationship between Culture and Agriculture, See Van Mansvelt - Jan Diek Van Mansvelt, "Basic Concepts of Alternative Agriculture", *The Proceedings of the Sixth International Scientific Conference of the International Federation of Organic Agriculture Movements (IFOAM) on Global Perspectives on Agroecology and Sustainable Agricultural Systems*, ed. P. Allen - D. V. Dusen (Santa Cruz: Agroecology Program, University of California, 1988), 1–14.

¹² Joachim Wach, *Sociology of Religion* (London and New York: Routledge, 1947), 67.

¹³ Giddens, *The Consequences of Modernity*, 95; Wallace - Wolf, *Çağdaş Sosyoloji Kuramları*, 381-389; Subaşı, *Gündelik Hayat ve Dinsellik*, 41-44; Polat, *Gündelik Yaşam Tercihleri ve Din*; Arslan, "Gündelik Hayatta Din". 1-6

¹⁴ Sūrat al-Zilzāl 99/7-8.

words, it is believed that not only the basic orders of religion such as prayer and fasting but also the whole of daily life will be taken into account. This high religious sensitivity measurement, which indicates that good or bad practice in greenhouse vegetable cultivation will have a reward in the hereafter, shows the importance of religious emphasis and spiritual sanction in solving ethical problems.

In the world of belief to which the participants belong, religion comes to the forefront with its aspect that produces meanings based on daily life. The judgment "whoever harms a person through an unhealthy product will be recompensed in this world" was measured with religious sensitivity at a rate of 0.864 (Table 4). In other words, the farmers engaged in greenhouse vegetable cultivation accept that the results of agricultural practices will not be seen only in the hereafter and that they will be rewarded during their own lives. It is a common belief in Turkish culture that evil and good deeds can return to the person before they die. On the other hand, the idea that a good or wrong has done will be rewarded not only in the hereafter but also in this world is also used as a means of making sense of positive or negative extraordinary situations. Berger¹⁵ defines religion as legitimacy that brings the moment to a reasonable level by giving a feeling of deep regret and a wrong behavior done in the past, especially when faced with a negative situation. The religious sensitivity that a mistake made in greenhouse cultivation will have consequences both here in the world before death and in the hereafter shows that the farmers have a moral awareness.

Although greenhouse vegetable growing is based on modern practices, there are humans in its center. People interpret the disasters that have happened to them as compensation for their mistakes or take them to a reasonable level through traditional religious discourses. In the literature, this issue is discussed under the subheading of religious legitimation. In this sense, religious sensitivity that a mistake made in greenhouse vegetable growing will be seen in the hereafter or this world can be considered as an important measurement. Since the products in classical agriculture are directly affected by the natural conditions, we can call the religious emphasis and divine meanings in the discourses of the farmers' traditional agricultural discourses. Traditional agricultural discourses such as nasip (grant), destiny, and tawakkul (resignation) function as religious legitimation discourses on the problems encountered. In other words, the concepts of nasip and tawakkul based on the perception of destiny appear as a concept used both for situations that exceed their conditions and when the targeted result is achieved. Concepts such as nasip and tawakkul, which are indicators in terms of religious mentality in the relationship between agriculture, culture, and religion, can also be interpreted with the phenomenological interpretation of Weber and Berger¹⁶ as religion's ability to produce solutions against theodicy problems. Although it is based on controllability, greenhouse cultivation is based on agricultural practices and discourses produced by the relationship between traditional agriculture and culture. In other words, traditional discourses used as a projection of the relationship between agriculture and tradition, farming and culture, agricultural activity, and religion in traditional agricultural activities are also used in greenhouse cultivation. It has been observed that the traditional religious discourse helps the farmers cope

¹⁵ Peter Ludwig Berger - Brigitte Berger, *Sociology: A Biographical Approach* (New York: Basic Books, 1972), 354-360; Peter Ludwig Berger, *Sacred Canopy: Elements of a Sociological Theory of Religion* (New York: Open Road Media Press, 2011), 66-67.

¹⁶ Max Weber, *From Max Weber:*, Translated, Edited, and with an Introduction By Hans H. Gerth – Charles Wright Mills, (New York: Oxford University Press, 1946), 267-270; Berger - Berger, *Sociology: A Biographical Approach*, 66-67; Berger, *Sacred Canopy: Elements of a Sociological Theory of Religion*, 354-360.

with the problems encountered in the face of natural events such as floods and tornadoes that affect the greenhouse areas, and disasters such as viruses and insects that damage the crops. It can be said that the religious sensitivity that a return for the mistake made will be seen not only in the hereafter but also in this world, has the potential to raise the threshold of enduring problems and to cope with them. The high level of perception of the world and the hereafter measured in greenhouse vegetable cultivation and similar discourses encountered in greenhouses in the field point to the level of influence of religions in daily life and to raise the psychological and sociological threshold in coping with problems. In this sense, analyzes based on the projections of culture and religion in traditional farming¹⁷ and these high religious sensitivities encountered in modern technological farming such as greenhouse vegetable cultivation show the role and influence level of religion in daily reality.

Religious sensitivity in the relationship between pesticides and health: Greenhouse cultivation can be defined as the agricultural area where the maximum product can be obtained in limited areas where nature and geographical conditions are controlled. In this sense, greenhouse vegetable growing is an industrial line of business. Greenhouse vegetable growing is directly related to technological development and creates an intersecting cluster of industrial production and profit relationship. All this technological and controlled production process could not solve the food safety problem. Negative market conditions, technological ignorance, greed for profit, excessive use of pesticides with panic, etc. reasons, further deepen the food safety problem.

The first thing that draws attention under the title of ethical issues is the spraying of pesticides in greenhouse vegetables. The subject of spraying pesticides in greenhouse cultivation opens the door to the pharmaceutical industry on the one hand, and greenhouse activities based on certain procedural practices, on the other. There is an intensive practice of using pesticides in greenhouse vegetable cultivation due to the growth of the synthetic pharmaceutical industry and with this growth rate, the development of sales policies such as payments in installments and in time of harvesting, the (pesticide) spraying experience of neighboring farmers, and the inability to obtain efficient products without (pesticide) spraying. However, there is a very high level of awareness about the harm these pesticides cause to nature and people. There are many reasons for irregular and careless pesticide use. Chief among these is that the farmer, who borrows money from seed and synthetic pharmaceutical companies, cannot be willing to produce less and has a desire to make high profits.¹⁸ In the study, religious sensitivity views on the relationship between pesticides and health were received from the farmers. At the very top of this, a general judgment such as "everything harmful to health is haram" was included and it was measured that the participants had a high level of religious sensitivity of 0.879 (Table 4). In the literature of Islamic law, the word haram, with its different derivatives, is used in eighty-three places in the Holy Qur'an and means an action that is prohibited by religion.¹⁹ Rather than counting the forbidden ones one by one, in general, things that harm health are considered haram, and a rule for any action is derived from it. In the meantime, it should be noted that the expression haram in the judgment directed at farmers is not a legal definition, but a definition for religious sensitivity.

¹⁷ Wendell Berry, *The Unsettling of America* (Berkeley: Counterpoint Press, 2015), 19.

¹⁸ Çokuysal, "Sürdürülebilir Tarım ve Gıda Üretiminde Etik İnkilemleri Anlamanın ve Tartışmanın Önemi", 114-123.

¹⁹ Muhammad Fu'ad Abdalbaqi, *al-Mu'jam al-Mufahras li-Alfaz al-Qur'an al-Karim* (Cairo: Dâr al-Kutub, 1364/1945). 179-199.

After this general religious sensitivity in greenhouse vegetable cultivation, two points come to the fore in pesticide spraying and health. The first of these is the harm caused by the person not using a mask during pesticide spraying, while the second is the harm given to the consumers through the wrong pesticide spraying of the products or the excessive use of pesticides. Since greenhouse vegetable growing is an activity done in closed areas, farmers need to protect their health with equipment such as masks during the pesticide spraying. Ultimately, this practice also points to the religious background of caring for the consumers in the pesticides and health equation. A high level of religious sensitivity was measured, with an average of 0.821, to the judgment directed to the participants that "not using a mask while spraying pesticides is to act contrary to the trust given by God" (Table 4). The concept of trust includes religious and cultural references to explore religious sensitivity in the relationship between pesticides and health. Based on the Qur'an, the soul/nafs have been entrusted to men in the tradition of Islamic thought. The five basic principles that must be preserved in the Islamic fiqh tradition are life, mind, religion, generation, and property.²⁰ The protection of people from harm that may occur against their own lives during pesticide spraying can be considered as the projection of protecting this trust given by God as well as the perception of health. This rate of religious sensitivity also shows the strength of the relationship between wearing a mask and protecting the Divine trust in the safe food production/safe business process.

Greenhouse vegetable growing, in which climatic conditions are controlled, is an industrial line of business that provides the opportunity to produce maximum profit as well as produce safe food. The use of pesticides whose safety has been tested and the inspection of the pesticides used by the authorized committees seem to be decisive in reaching the goal of safe food. However, conditions such as the sales and information policy of the synthetic pharmaceutical industry, the farmer's greed for profit, and the excessive use of pesticides in panic in cases where the efficient product cannot be obtained can cause irregularities. Religious sensitivities may come into play at the point of overcoming these dilemmas experienced by farmers. The concern and awareness that the produced food will reach a consumer is the intersection point of the healthy food and pesticide relationship in the greenhouse production process. In this sense, it has been observed that greenhouse vegetable producers have a high religious sensitivity of 0.883 to the judgment that "religion also recommends that people's health come to mind when spraying pesticides in greenhouse vegetable products" (Table 4). Considering the health of both the producer and the consumer during spraying pesticides and the discovery of religious sensitivity against the wrong to be done at this point can also be considered as a preventive element.

A decisive application in the relationship between safe food and pesticide spraying is the harmony of spraying pesticides and harvesting timing. The judgment of "not complying with the timing in pesticide spraying and collecting greenhouse vegetable products is against religion", which was directed to the participants, resulting in religious sensitivity at a rate of 0.770, which is very close to high. Pesticide spraying and observing the harvest time have a direct economic relationship (Table 4). Today, organic pesticides developed by both the products and the balance of nature are recommended, and if a farmer goes out of standard, s/he is aware that s/he may suffer economically because s/he does not comply with market conditions or export

²⁰ Abu Isḥaq Shatibi, *al-Muwafaqat* (Beirut: Muassasa al-Risala, 2017), 2/337.

rules. On the other hand, the importance of religious sensitivity towards greenhouse vegetable growing with a religious sensitivity was also measured by the study.

Entrusting human bodies or causing harm by not following the timing; again, bringing bodies to mind during pesticide spraying is associated not only with religious texts but also with agricultural activities, and with soil and body in ancient culture. Berry²¹ analyzed the relationship of respect for the body, responsibility between the body and the world with the conceptual set of agriculture-land-culture and religion: "Our bodies are a part of creation and involve us in all mystery matters. Our bodies are also agricultural. Because no matter how urban our lives are, our bodies live by farming; come from the land and return to it, and therefore we live in agriculture as we live in meat. While we live, our bodies are the moving particles of the earth, inextricably linked to both."²² This relationship of man with the land on an ontological basis is present in all ancient religions. In this sense, the relationship of the human body with the environment directly affects attitudes and behaviors in farming.

Table 4. Scale Item Religious Sensitivities

		mean	Std. Dev.	min	max
1	Religion also recommends that people's health come to mind when spraying greenhouse vegetable products.	0.883	0.158	0.2	1
2	Religion encompasses all of life, including greenhouse vegetable production.	0.873	0.169	0.2	1
3	Everything that harms health is haram.	0.879	0.155	0.2	1
4	It is against religion not to comply with the timing in spraying and collecting greenhouse vegetable products.	0.770	0.219	0.4	1
5	Whoever harms a person through an unhealthy product will be recompensed in this world.	0.864	0.164	0.4	1
6	Changing the genetics of seeds spoils nature created by God.	0.614	0.257	0.2	1
7	In the Hereafter, a person will be taken into account not only for his/her worships but also for the correctness of his vegetable production tasks.	0.895	0.151	0.2	1
8	Negative market conditions are at the root of the moral problems of producers in greenhouse vegetable production today.	0.803	0.225	0.2	1
9	Not using a mask while spraying products is to act against God's trust.	0.821	0.211	0.2	1

Religious sensitivity in the relationship between genetics and nature: Another issue where ethical debates are most intense in greenhouse vegetable cultivation is the genetic modification of seeds. Mankind has sought ways to improve the quality and standards of life and has succeeded in realizing some of them with new advances in biotechnological fields.²³ With the methods developed in the early 1970s, in the genetic structure of living things; changes were made that could not be achieved with traditional healing technology and natural reproduction processes.²⁴ Using improved seed is important for food security as well as an important practice for high yields. Therefore, the judgment that we directed to greenhouse vegetable producers that

²¹ Berry, *The Unsettling of America*, 5.

²² Berry, *The Unsettling of America*, 7.

²³ Erkan Arı- Veyse Yılmaz, "Genetiği Değiştirilmiş Ürünlere Yönelik Tutum ve Davranışların Araştırılması: Eskişehir ve Bursa Örneği", *Ankara Hacı Bayram Veli Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi* 22/2 (2020), 381-402; Abdullah Tahir Bayraç - Gülsüm Kalemtaş, *Genetiği Değiştirilmiş Organizmalar* (Ankara: ODTÜ Bilim ve Toplum Kitapları, 2011), 5-7.

²⁴ Ercan Kaya et al., "Üniversite Öğrencilerinin Genetiği Değiştirilmiş Gıda Ürünlerine Bakışı", *Iğdır Üniversitesi Fen Bilimleri Enstitüsü Dergisi* 2/3 (2012), 55-60.

"*changing the genetics of seeds spoils the nature created by God*" was accepted at a moderate level of 0.614, and its religious sensitivity was not measured as high as other judgments (Table 4). In other words, although the farmers accept that the genetic modification of seeds spoils the nature created by God, they hold the idea that this is necessary for production. On the other hand, there are ethical concerns among greenhouse vegetable growers regarding certain practices such as genetically modified organisms (GMOs). There is an ongoing debate as to whether it is necessary to use GMOs to improve quality of life or to avoid any associated risks. Such questions are explained by the concepts of *maslahat* (benefit) and *mafsadat* (harm) in Islam. There is no specific GMO that has been declared illegal by Muslim scholars in this regard. However, in general, they state that any GMO containing an illegal substance is prohibited in Islam. Such a statement is understandable as Islam gives the highest priority to preserving sharia (Islamic law) which enjoins *halal* and *haram* in human life. Protecting human health and the environment has also been given priority, so any GMO that could harm either is also considered illegal.²⁵ It can be said that the commercial concerns of the farmers in greenhouse vegetable marketing precede the attitudes and behaviors of religion. Since the advantage of genetically modified products in terms of productivity increases their social life quality, it causes a change in their religious attitudes.

The conclusion that we tried to measure the farmers' tendency to ethical dilemmas and practices resulted in a high level of religious sensitivity at a rate of 0.803, to the judgment that "*the moral problems of producers in greenhouse vegetable production are based on negative market conditions*" (Table 4). Negative market conditions, such as the instability of input costs in greenhouse vegetable growing and the continuity of low prices in marketing the products, are among the reasons that lead farmers to ethical problems. Again, it is observed that many market conditions such as production by borrowing in farming, sales strategies of pharmaceutical companies, triggering opportunism in some price instability times, the quality of the products grown, expressing that the periodical processes are followed even though they are not followed during the cultivation, and the greed for excessive profits affect the ethical dimension of agricultural activities. However, farmers, especially greenhouse vegetable growers, have to produce to continue their lives despite the adverse market conditions. It should not be forgotten that, in addition to the effects of the reasons we have just mentioned, the fact that the farmers have the opportunity to reflect some of their negative behaviors on a psychological basis also contributed to this rate.

There are several warnings of the Prophet and the prohibitive provisions of the Islamic Fiqh tradition to which the farmers belong about matters such as black market, which disrupts the market,²⁶ inflaming the market, buying the product before it enters the market, the sale of the goods of the producer by intermediaries, sale upon sale, monopolization and destructive price practice, the intervention of the state to disrupt the market balances and preventing those who want to bring their product to the market.²⁷ When he was asked to write a book about asceticism, Muhammad al-Shaybani's reply, "Isn't that enough we wrote the book of shopping

²⁵ Noor Munirah Isa - Saadan Man, "First Things First: Application of Islamic Principles of Priority in the Ethical Assessment of Genetically Modified Foods", *Journal Agricultural Environmental Ethics*, 27(2014), 857-70.

²⁶ Ahmad b. Hanbal, *Musnad al-Imam Ahmad b. Hanbal*, ed. Ahmad Muhammad Shakir (Cairo: Dar al-Hadith, 1416/1995), 271, 353, 362.

²⁷ Ahmad b. Hanbal, *Musnad al-Imam Ahmad b. Hanbal*, 5/14, 271, 353, 362; Abu Abdillah Muhammad b. Isma'i'l b. Ibrahim al-Ju'fi Al Bukhari, 1422. *Sahih al-Bukhari* 1st ed., ed. Muhammad Zuhayr b. Nasir, Dar Takwin al-Najat, Century; Meir Jacob Kister, "The Prophet's Market", *Journal of the Economic and Social History of the Orient* 8/3 (1965), 272-276; M. Fatih Turan, "Islam Hukuku Açısından Yıkıcı Fiyat Uygulaması", *Atatürk Üniversitesi İlahiyat Fakültesi Dergisi* 43 (2015), 78-103.

(buyu')?" is rather meaningful.²⁸ In the discussions of free market and ethics, the social aspect of a purely market economy and a market economy without a policy regulated by the state is interpreted as a disadvantage that cannot be justified ethically.²⁹ In this sense, in the tradition of Islamic thought, economics evokes balanced behavior and has been seen as the most obvious determinant of being pious. This judgment has played an important role in linking the market with religion in the sense of creating awareness, and in discovering space for the participants to reflect on their problems outside of themselves.

2.3. Linear Regression Model Analysis

Factors presumed to affect religious sensitivity to the ethical problems of greenhouse vegetable cultivation were divided into two categories: Characteristics and attitudes of producers. The characteristics of the producers were determined as education, experience and gender. The following behaviors in greenhouse vegetable cultivation are thought to affect the religious sensitivity of producers to the ethical problems of greenhouse vegetable cultivation: The use of pesticides that harm human health and their sensitivity to harvest time, a short break in greenhouse vegetable production due to Friday prayer, and believing that one is praying while doing greenhouse vegetable production.

Various studies have shown that better educated people are more sensitive to ethical issues posed by new technologies in agriculture because they have a broader horizon. In this study, the education variable was divided into three categories according to the education classification in Turkey. The first category (primary education) includes only participants with compulsory basic education (comprehensive school) or less. The second category includes respondents with a vocational or high school diploma. The third category (bachelor's degree) includes participants with a diploma or bachelor's degree from universities. In the linear regression model, primary education level was taken as the reference category. According to primary education level, the coefficient of the explanatory variables of high school (EDU2) and undergraduate (EDU3) education level is positive and statistically significant at 1% significance level (Table 5). Training enhances producers' ability to access, process, and use information from a variety of sources. The differences in the education level of the producers also differentiated their religious sensitivities to the ethical problems of greenhouse vegetable cultivation. It can be said that the producers with high school and undergraduate education levels have higher religious sensitivity to the ethical problems of greenhouse vegetable cultivation compared to the producers with primary education levels.

The specific experience of producers with greenhouse vegetable cultivation may be linked to their general religious attitudes. The producer's experience is measured by the number of years assumed to be positively associated with religious sensitivity to greenhouse vegetable growing ethical issues. The number of greenhouse years was included in the model as a categorical independent variable (EXP). In this study, the experience variable was divided into four categories (Appendix). In the linear regression model, the reference category is 1-5 years. According to the reference year, the coefficient of the experience variable of 16 years or more is positive and statistically significant at the 1% significance level (Table 5). Greenhouse vegetable growers are less likely to switch from traditional practices than those who have been

²⁸ Ahmed Duran, "İmam Muhammed es-Şeybanî'nin Hayatı ve Hanefî Fıkhnın Tedvinindeki Yeri", *İslam Hukuku Araştırmaları Dergisi* 9 (2007), 171-198.

²⁹ Gerhard Kruip, "Sosyal Piyasa Ekonomisinin Ana Hatları ve Bunların Hıristiyan Sosyal Ahlakıyla Bağlantısı", *Sosyal Piyasa Ekonomisi ve İslam'daki Algılanışı* (Ankara: Ofset Fotomat, 2011), 9-34.

growing greenhouses for a short time. In this respect, it can be said that the producers who have been working in greenhouses for a long time have a religious sensitivity to ethical problems compared to the less experienced ones.

Previous research has identified significant gender differences in people's religious attitudes. Although the size of the gender gap varies widely, on average, women display higher levels of religious behavior and attitudes than men in most areas of greenhouse vegetable growing ethical issues. As a matter of fact, according to the linear regression model, it was determined that men were not religiously sensitive to the ethical problems of greenhouse vegetables compared to women. In the linear regression model, the coefficient of the SEX dummy variable is negative and statistically significant at the 1% significance level (Table 5). Women have certain experiences in their social positions that have fostered concerns about the ethical issues of greenhouse vegetable cultivation. Women still tend to be primary family builders, making them more likely to take on decision-making roles in greenhouse vegetable growing outside of their immediate family. Moreover, women still have a central role in obtaining and cooking food in the household, which may reinforce their interest in the source of food.

The obligation of Friday Prayer requires postponing the greenhouse vegetable production tasks for a short time (one hour) in terms of general social life. However, the religious behavior of the producers may differ depending on their level of belief. Therefore, the FRID dummy variable was included in the model to determine the effect of the religious behavior observed in Friday Prayer on religious sensitivity to greenhouse vegetable ethical problems. The coefficient of the FRID explanatory variable is positive and statistically significant at the 1% significance level (Table 5). Producers who break their job due to Friday Prayer while doing greenhouse vegetable growing activities are more religiously sensitive to ethical problems than other producers. In this respect, the strategies to be followed to overcome the ethical problems in greenhouse vegetable cultivation should be considered within the religious framework.

Agriculture is seen as worship in social life, from past to present, because it is the profession of a prophet. WORS dummy variable was included in the model to determine the reflections of this belief on greenhouse vegetable growing. According to the linear regression model estimation, the coefficient of the WORS explanatory variable was found to be positive and statistically significant at the 1% significance level (Table 5). Producers who think that they are praying while doing greenhouse vegetable production tasks are more religiously sensitive to ethical problems than others.

In the greenhouse vegetable production process, the initial costs in terms of soil preparation and input use are quite high. To prevent the loss of income as a result of the deterioration of fruit quality by the pests of the vegetables planted in the greenhouse, although it is prohibited, it may be that the producers have to use pesticides that harm human health. Therefore, behavioral patterns that create ethical problems in terms of human health are realized in greenhouse vegetable cultivation. With the model estimation, the coefficient of the PEST explanatory variable was found to be negative and statistically significant at the 1% significance level (Table 5). Producers, who have to use pesticides that harm human health to prevent income loss in greenhouse vegetable cultivation, do not have religious sensitivity to ethical problems compared to other producers.

In terms of consumers, vegetables produced using inputs that do not harm the environment and human health are considered safe food products. Since the chemical control against diseases

and pests in greenhouse vegetable cultivation, there may be a problem of pesticide residues at an unsuitable level for human health; considering the harvesting frequency of the products, pesticides should be used with the appropriate "last spraying - harvest" period. In this respect, the HARV dummy variable was included in the model as an explanatory variable to determine the adaptation of the producers to the pesticide control harvest time. The coefficient of the HARV explanatory variable is positive and statistically significant at the 1% significance level (Table 5). It has been determined that the producers, who pay attention to the harvest times when spraying greenhouse vegetables, are more religiously sensitive to ethical problems than other producers. Recently, it was observed that the sensitivity of the producers has increased due to the inspections carried out by agricultural experts by taking fruit samples during the greenhouse vegetable harvesting periods.

Multicollinearity is a data problem that complicates model prediction. In a model with more than one independent variable, some of the variables may be related as a result of larger variances. Thus, it causes multicollinearity. The least Squares Method assumptions become invalid when there are multiple linear connections. Variance Inflation Factor (VIF) is used to test the multicollinearity problem. In the regression model, since the mean VIF value and the VIF values of the independent variables are less than 5, there is no multicollinearity problem.³⁰

Since the cross-sectional data is prone to varying variance, the presence of heteroscedastic error terms in the regression model was tested. For this, the general variable variance test proposed by Breusch-Pagan was applied. The result was F-statistic=31.12 ($p=0.00$); H_0 means that the constant variance hypothesis should be rejected. In other words, there is a problem of varying variance in the model. Therefore, Robust prediction results are given. The coefficient of determination $R^2=0.45$ shows that the data with the specific model reveal relatively good goodness of fit. At the same time, this value shows that 45% of the price changes are explained by the variables included in the linear regression model.

Table 5. Regression Model for Religious Sensitivity Index to Greenhouse Vegetable Farming Ethical Problems

Explanatory variables	Coef.	Robust Std. Err.	T	p>t	[95% Conf.	Interval]
Constant	0.643	0.019	34.73	0.000***	0.607	0.680
EDUCATION						
EDU2	0.035	0.008	4.42	0.000***	0.019	0.051
EDU3	0.101	0.008	12.02	0.000***	0.084	0.117
EXPERIENCE						
EXP2	0.020	0.013	1.57	0.118	-0.005	0.045
EXP3	0.015	0.013	1.15	0.250	-0.010	0.039
EXP4	0.046	0.010	4.65	0.000***	0.028	0.065
SEX	-0.026	0.008	-3.45	0.001***	-0.041	-0.011
FRID	0.046	0.009	4.90	0.000***	0.030	0.062
WORS	0.018	0.009	1.94	0.052**	0.000	0.036
PEST	-0.023	0.008	-2.84	0.005***	-0.039	-0.007
HARV	0.051	0.019	3.98	0.000***	0.026	0.076
Diagnostics Tests						
VIF						1.40
R²						0.45
F (10,419)						31.12
Prob > F						0.000

³⁰ A. H. Studenmund, *Using Econometrics: A Practical Guide* (New York: Pearson Publishers, 2011), 56-58.

Breusch-Pagan / Cook-Weisberg test	chi2	12.41	Prob> chi2	0.000
***, ** and * represent level of significance at 1%, 5% and 10%, respectively.				
Number of observations: 430				

Conclusion

In this study, religious sensitivity to ethical problems in greenhouse vegetable cultivation is analyzed through sub-categories such as the perception of daily life and religion, the religious infrastructure of the relationship between pesticide usage and health, and the relationship between genetics and nature. In this study, in which we focused on the human factor, unlike the studies on the ethical problem of greenhouse vegetable cultivation, the participants stated that their understanding of religion covers their whole life and they accept religious sanction. Based on the fact that religious sensitivity covers daily life, it is believed that mistakes made in greenhouse vegetable production will be recompensed both in this world and in the hereafter. The religious behavior of the producers may differ with the level of belief. Producers who think that they are praying while doing greenhouse vegetable production tasks and halt the job because of Friday Prayer are more religiously sensitive to ethical issues than other producers. This situation shows that the strategies to be followed to overcome the ethical problems in greenhouse vegetable cultivation should be considered within the religious framework.

The characteristics of the producers, their attitudes, and behaviors in the production process are known as the factors that affect the religious sensitivity towards the ethical problems of greenhouse vegetable cultivation. These factors were tested with a multiple linear regression model. In the linear regression model, it can be said that the producers with high school and undergraduate education levels have higher religious sensitivity to the ethical problems of greenhouse vegetable cultivation compared to the producers with primary education levels. The differences in the education levels of the producers also differentiated their religious sensitivities to the ethical problems of greenhouse vegetable cultivation. On the other hand, the gender variable was included in the model to determine the importance of gender differences in terms of religious behavior and attitude. According to the gender variable, it was determined that men were not religiously sensitive to the ethical problems of greenhouse vegetables compared to women. Certain experiences of greenhouse vegetable growers may be linked to their general religious attitudes. In this respect, it can be said that the producers who have been working in greenhouses for a long time have a religious sensitivity to ethical problems compared to the less experienced ones.

It can be stated that the most problematic area in greenhouse vegetable production is pesticide usage. In addition to harming their health during spraying, it is known that consumers may be harmed due to excessive and uncontrolled use of pesticides. Producers, who have to use pesticides that harm human health to prevent loss of income, do not have religious sensitivity to ethical problems compared to other producers. It has been determined that the producers who spray according to the harvest time, which is important for the consumption of greenhouse vegetables, are more religiously sensitive to ethical problems than other producers. While the participants express the lack of attention to their health with religious sensitivity as not taking care of the trust given by God, they also think that the harm they have caused to others will be accounted for in the hereafter.

Another issue on which the ethical problems of greenhouse vegetable growing are focused is that the genetic modification of seeds spoils nature created by God. It was observed that there was an awareness of seed breeding and genetic modification of the seed among the

participants, and there was moderate religious sensitivity that genetic modification of the seed spoils the nature created by God. The importance of the human factor in solving ethical problems in greenhouse vegetable growing has been determined and it has been observed that strengthening religious sensitivity will contribute to the solution of these problems. It has been realized that religion produces a mentality for the whole of life, including agriculture, and this mentality will play an important role in dealing with ethical problems.

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