

An Analysis of Environmental Requirements Affecting the Development and Promotion of Organic Agriculture of Iran

Majid Reza Khodavardian, Seyed Mehdi Mirdamadi*, Maryam Omid Najaf Abadi,
Seyed Jamal Farajolah Hosseini

Department of Agricultural Extension and Education, Science and Research Branch, Islamic Azad University,
Tehran, Iran

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ABSTRACT

The Overall Purpose of the Present Study Was to Investigate the Environmental Requirements Affecting the Development and Extension of Organic Agriculture From the View of the Managers of Agricultural Engineering & Technical Consulting Service Cooperatives In Iran. This is a Survey Research which was conducted through Using a Questionnaire. The Population of the Present Study Consisted of Managers of Agricultural Engineering & Technical Consulting Service Cooperatives In Iran (N=1279). Stratified Proportional Sampling was used for data collection. The Sample Size was Determined by Cochran Formula (N=223). Validity of the Research Instrument (here, The Questionnaire) Was Confirmed by a number of Experts in the Field of Organic Agriculture in Vur Country (Iran) as Well as by Faculty Members of Department of Agricultural Promotion and Education. Reliability of the Questionnaire Was Determined by Using Cronbach's Alpha Test ($\alpha=0.82$). SPSS 19 and Lisrel 8.8 as Well as Spearman Correlation Test and Confirmatory Factor Analysis were used for data Analysis. Results Suggested That According to the Respondents there is a Significant Relationship between Environmental Requirements and indicators of the Development and Extension of Organic Agriculture.

Accordingly, the Researcher has Presented Some Suggestions Including Adherence to the Principles of organic Agriculture by Farmers, Observance of the Environmental Principles and Legislation by the Public, Associated Authorities, and Farmers, Distribution of Biological Inputs at Affordable Prices, Raising the Participation of the Public and Farmers to Protect Biodiversity, and Encouraging Farmers to Apply Environmentally Friendly Technologies.

KEYWORDS: Environmental Requirements, Development and Extension of Organic Agriculture, Managers of Agricultural Engineering & Technical Consulting Service Cooperatives.

INTRODUCTION

Currently, the Use of Inefficient Common Farming Practices Based on Technology Transfer in Quantitatively Increasing of Agricultural Products has Caused Challenges to Biosafety and Sustainable Production, Leading to Crises Such as Soil Erosion, Water Shortage, Greenhouse Gas Emissions Spread of Diseases, and Disruption of Ecological Balance in Different Parts of the World, Which Puts Human Health into Danger. Five Million Tons Annual Consumption of Poison in the World has led to Twelve Million People Being Poisoned and a Total of 220 Cases of Death on an Annual Basis. Annually, Permanent Diseases affect 735 People and 37 People by Cancer, Which Implies the Use of Products Infected with Chemical Materials [1]. Unlike the Rapid Growth of the Area under Organic Agriculture in Developed Countries, the Development of Organic Agriculture in Developing Countries Including Iran has Been Very Slow, [2]. First National Sustainable Agricultural Development Plan in Iran Entitled "Optimal Use of Fertilizers and Pesticides" was implemented over a 10-year time Period, Beginning in 1991 and Ending in 2001. Unfortunately, this 10-year Plan Could not Fully Reach its Goal, Namely Setting agricultural products free from Chemical Residues, Due to Lack of Interest of Farmers in it [3]. According to Statistics Published in 2008, the Value of Organic Agricultural Products Worldwide is 1.7 to 4 Times as Compared to conventional products. One Hand in Recent Years the Demand for Organic Products has Experienced an Increasing Growth Rate and Also Turnover of Organic Products at the International Level has Experienced High Growth, Amounting to Some 4.55 Billion Dollars in (2009) on the Other Hand, Latent Demand for Organic Products Was about 5.48 Billion Dollars in (2007). Thus, Organic Products is a Potential and Profitable Market and Due to the Growing Demand for These Types of Products, Studies Should be Directed and Focused on Producing and

* **Corresponding Author:** Seyed Mehdi Mirdamadi, Department of Agricultural Extension and Education, Science and Research Branch, Islamic Azad University, Tehran, Iran. Email: mirdamadi.mehdi@gmail.com

Supplying Such Products [4] According to a Report by the Research Institute of Organic Agriculture, about 15 Thousand Hectares of Land in Iran was Devoted to Organic Farming[5]. In 2010, the Area Under Organic Farming was 7256 Hectares. Iran's Main Organic Products Were Pistachio (1382 Hectares), Wheat (1156 Hectares), Currant (700 Hectares), and Dates (595 Hectares), and in 2011, Over (95%) of Organic Products Produced in Iran Were Exported to European Countries [6].

International Federation of Organic Agriculture Movement (IFOAM) has Provided a Comprehensive Definition as to organic agriculture as follows, "organic agriculture is a Production System Which Protects the Health of Human Beings, Ecological Systems, and Soil. It is Based on Ecological Behaviors, Biodiversity, and Natural Cycles and prefers inputs with competitive effect. organic agriculture is a Combination of Trade, Innovation, Sciences Beneficial for the Environment, Promotion of Healthy Products, and good Quality of Life [7]."The Main Goal of Organic Agriculture is to Establish Comprehensive, Organized, and Human Agricultural Production Systems With no Conflicts With Economic and Environmental Interest.

In This Type of Agriculture the Degree of Confidence in Renewables Utilized by Agriculture Sector is to the Extent that it Can Provide the Possibility and Power to Produce Acceptable Amounts of Food Required by man and Also Conditions Such as Immunity Against Pests and Diseases for Plants and Animals[8] . Currently, a Remarkable Example of the Extension of Organic Agriculture in Iran is the Establishment of Farmers Field Schools (FFS) to Empower Farmers in this Area. In Order to Implement the Decisions of Iran's Supreme Council of Integrated Pest Management and National Plan for Development & Extension of Organic Products, the Iranian Government has Recently Included in its Agenda the Empowerment of a Network Consisted of 1200 Non-Governmental Experts, With the Assistance of 150 Thousand Farmers on 35 Products in an Area of 250 Thousand Hectares of Land[9] .

Here we Mention Some Studies Conducted and Experiences Gathered in the Field of Environmental Requirements of organic agriculture. according to Van Kelly and Lawrence [10], When Farmers Feel that they are in Danger Due to Environmental Destruction, They are Move Likely to Accept Environmental Management Techniques. A Study by Wariner and Mole [11] Indicates that Farmers Who Implement Conservation Practices on Their Farms, in Fact Consider the Overall and Long-term Soil Conservation Benefits as Being More Important Than its Problems. Van Kelly and Lawrence Believe that when considering the ecological effect on conservation Practices, Two Factors are Significant, Namely Real Situation of Soil Erosion and Perception of the Situation by Farmers. Some Researchers Have Estimated the Rate of Erosion on Farms by Using Universal Equation of Soil Erosion, While Some Others Have Considered the Farmer's Assessment of the Situation of Soil Erosion as a Criterion.

MATERIALS AND METHODS

The Present Study is a Descriptive-Correlation Research in Terms of Nature, Topic, and Objectives Predicted for it. On the other Hand it is a Survey Research Since it Uses a Questionnaire to Discover Facts. With Respect to Numerical Analysis of Data, it is a Quantitative Research, as it Explains the Reasons for Changes in Social Phenomena. Finally, With Respect to the Possibility of Controlling the Variables, it is Considered a Non-Experimental Research. The Population of the Present Study Consisted of Managers of Agricultural Engineering & Technical Consulting Service Cooperative in Iran (N=1279) Within 31 Provinces. Stratified Proportional Sampling Was Used for Data Collection. The Sample Size was Determined (n=223) by Using Cochran Formula. Validity of the Research Instrument (a Questionnaire) was Confirmed by a Number of Experts in the Field of Iran's Organic Agriculture as well as by Faculty Members of Department of Agricultural Promotion & Education. Reliability of the Questionnaire was Determined by Using Cronbach's Alpha Test ($\alpha=0.82$). SPSS 19 & Lisrel 8.8 as well as Spearman Correlation Test and Confirmatory Factor Analysis Were Used for Data Analysis. The Dependent Variable was "Organic Agriculture Development & Extension" and Independent Variables Included 12 Components of Environmental Requirements set out in Table (1).

RESULTS

According to the Results Listed in Table (1), One Can Say that More Than 90 Percent of the Respondent Managers Considered the Impact of the Following Requirements on Development & Extension of Organic Agriculture as Being Very High: Comprehensive Utilization of Green Manure and Plant Residuals on the Farm, the Use of Animal Manure and Livestock and Poultry Waste, Biological Control of Pests, Insects, Weeds and Plant Diseases, no Use of Additives' and Eliminating Chemicals From Farm. Further, Among the Indicators of Environmental Requirements of Organic Agriculture Development and Extension, Biological Control of Pests, Insects, Weeds and Plant Diseases, Complete Utilization of Green Manure and Plant Residuals on the Farm, no Use of Additives and Eliminating Chemicals From Farm, Observance of Principles of Environmental Protection by

Agriculture Beneficiaries, the Use of Animal Manure and Livestock and poultry Waste, and Observance of the Principles of Low Input Sustainable Agriculture by Farmers are the First to Forth Priorities, Respectively. Indicators of Proper Disposal of Waste Materials and Agricultural Waste Recycle by Farmers, Observance of the Principles of Environmental Protection by the People, Applying New Environment-Friendly Technologies by Farmers, Controlling the Emission of Environmental Pollution by Agriculture Beneficiaries Familiarity of the Associated Authorities With Environmental Management, and Implementing the Legislation Related to the Protection of the Diversity of Plant, Animal and Aquatic Species Have the Lowest Average Rating (Fifth to Tenth Priorities) Among Environmental Requirements of Development & Promotion of Organic Farming.

According, From the Standpoint of Managers of Cooperatives for Counseling Services and Development & Extension of Organic Agriculture, One Can See that the Significance Level is 0.019 (Less than 0.05) , and thus the Research Hypothhesis is Confirmed With (%95) Confidence. there is a Positive Significant Association Between the Environmental Requirements of Organic Agriculture.

Confirmatory Factor Analysis of Environmental Requirements of Organic Agriculture: In Order to Confirm the Environmental Requirements of Organic Agriculture Development and Extension, Confirmatory Factor Analysis was Performed on 12 items. To Obtain a Well-Fitted Proper Model, the above – Mentioned items Were Divided into 3 General Factors, namely “Observance of the Environmental Principles and Legislation by the Public and Authorities, Observance of the Environmental Principles by Farmers, and Observance of Organic Agriculture Principles by Farmers.” As you see in Table (2), (t) Values Obtained for each item of the table are Larger than (2). Thus, au items Listed are Significant and in General, One Can Say that the Model Explained is Significant.

Evaluating Fitness of the Model Suggested for the Environmental Requirements of Organic Agriculture:

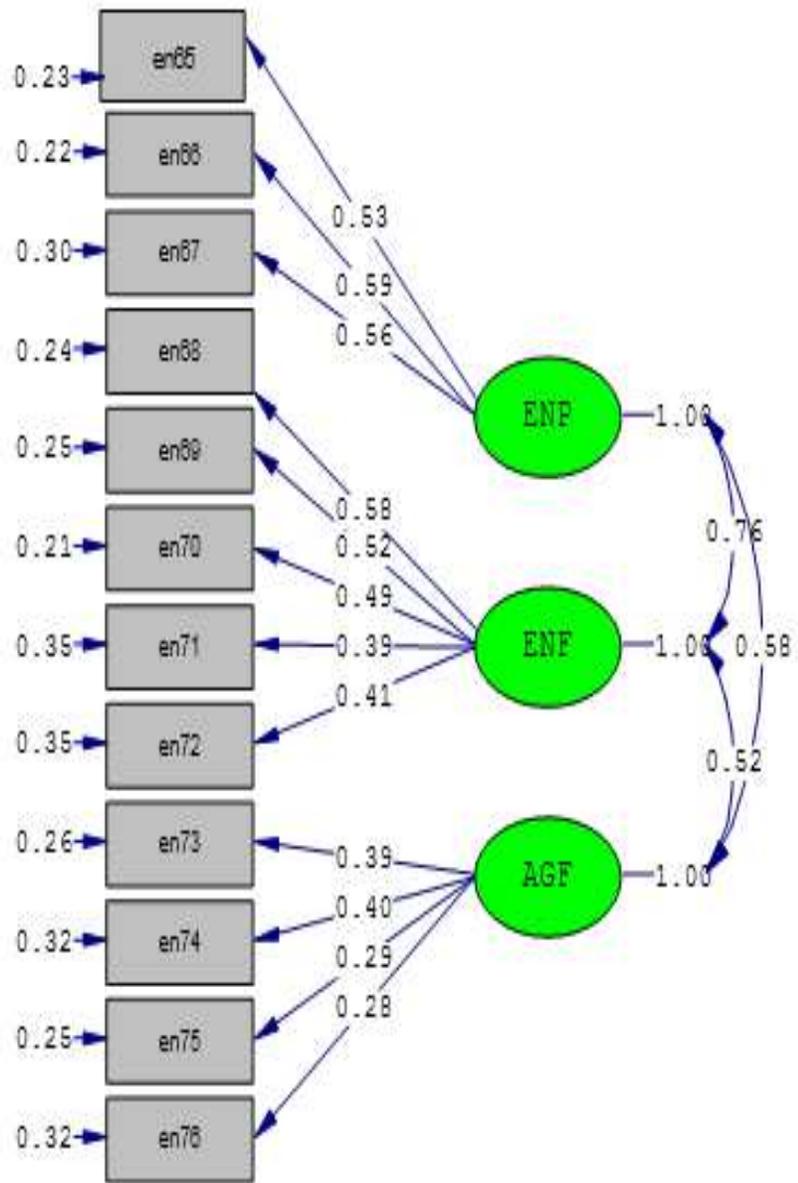
Based on the Information Obtained about the Environmental Requirements of Organic Agriculture Development & Extension the Ratio of Chi Square to the Degree of Freefom ($X^2_{df < 3}$) is 2.28, Which is Less than (3).

P-Value = (0.292), Which is Larger than (0.05), Indicating the Significance of the Fitness test. There Fore Our Model has a Good Fitness (fig .1).

Table (1): Prioritizing Environmental Requirements Variables of Organic Agriculture From the Managers’ Standpoint:

Observed Variables	Mean	Standard Deviation	Coefficient of Changes	Priority
Biological Control of Pests, Insects, Weeds, and Plant Diseases	4.54	0.575	0.127	1
Complete Utilization of Green Manure and Plant Residuals on the Farm	4.43	0.646	0.146	2
No Use of Additives and Eliminating Chemicals From Farm	4.28	0.627	0.146	2
Observance of the Principles of Environmental Protection by Agriculture Beneficiaries	4.28	0.674	0.157	3
The Use of Animal Manure and Livestock and Poltry Waste	4.39	0.689	0.157	3
Observance of the Principles of Low-input Sustainable Agriculture by Agriculture Beneficiaries	4.23	0.715	0.169	4
Waste disposal and recycling agricultural waste by beneficiaries	4.26	0.724	0.170	5
The Use of New Eco-Friendly Technologies by Farmers	4.15	0.711	0.171	6
Observance of the Principles of environmental protection of the people	4.18	0.721	0.172	7
Controlling the Emission of Environmental Pollutions by Agriculture Beneficiaries	4.29	0.759	0.177	8
Officials familiar with the environmental management	4.18	0.756	0.181	9
Implementation of the Legislation Ralated to Biodiversity Protection	4.13	0.788	0.191	10

Scales Used in the Above Table(1): 1 = Very Low; 2 = Low ; 3= Somewhat ; 4= High ; 5 = Very High



Chi-Square=116.35, df=51, P-value=0.292, RMSEA=0.016

Fig (1): Structural Model for Confirmatory Factor Analysis of the Environmental Requirements of Organic Agriculture

Table (2): Results of Confirmatory Factor Analysis of Organic Agriculture’s Environmental Requirements:

Latent Variables	Environmental Requirements	Standard Coefficient	(t) Value	R ²	Standard error
Observance of the Environmental Principles and Legislation by the Public and Authorities (ENP Code)	Observance of the Principles of Environmental Protection by the Public	0.53	11.83	0.55	0.23
	Familiarity of Authorities with Environmental Management	0.59	12.68	0.61	0.22
	Implementing the Legislation Related to the Protection of the Diversity of Plant, Animal and Aquatic Species	0.56	11.30	0.51	0.30
Observance of the Environmental Principles by Farmers (ENF code)	Controlling the emission of Environmental Pollution by Agriculture Beneficiaries	0.58	12.44	0.58	0.24
	Proper Waste Disposal and Recycling of Agriculture Waste by Beneficiaries	0.52	11.50	0.52	0.25
	Observance of the Principles of environmental protection by farmers	0.49	11.80	0.54	0.21
	Observance of the Principles of Low-input Sustainable Agriculture by Agriculture Beneficiaries	0.39	8.27	0.31	0.35
	The Use of new Eco-Friendly Technologies by Farmers	0.41	8.58	0.23	0.35
Observance of the Principles of Organic Agriculture by Farmers (AGF Code)	Complete Utilization of Green Manure and Plant Residuals on the Farm	0.39	7.84	0.27	0.26
	The Use of Animal Manure and Livestock & Poultry Waste	0.40	7.43	0.23	0.32
	Biological Control of Pests, Insects, Weeds, and Plant Diseases	0.29	6.42	0.25	0.25
	No Use of Additives and Eliminating Chemicals From Farm	0.28	5.59	0.19	0.32

DISCUSSION AND CONCLUSION

In a Study Conducted by Hosseini and Ajoodani [12], the Results of the Survey for the Possibility of the Development and Extension of Organic Agriculture in Kermanshah Province From the Standpoint of Agricultural Experts Showed that There is an Association Between Educational and Economic Factors and the Possibility of the Application of Organic Agriculture. Further, their Results Indicated that there is no Significant Association Between Technical, Managerial, Policy Making, Psychological as Well as Social Factors and the Possibility of the Application of Organic Agriculture. Moreover, Saei [13] Writes about Farmer’s Knowledge and Acceptance of the Environmental Issues Associated With Sustainable Agriculture as Follows, “Farmer’s Knowledge of Environmental Issues is Very Weak and Production Cooperatives have a Major and Significant Impact on Farmer’s Adoption of Environmental Issues. Also Encouraging Extension Workers and Model Farmers to Participate in Discussions and Providing Training to Other Farmers are Among the Factors to Sustainable Agriculture. Results of a Survey Conducted by Kubala et al [14] on the Incentive of Farmers in Malopolska Province to Switch to Organic Agriculture in Poland Suggested that There is no Association Between the Respondents’ Environmental Knowledge and Their Age, Gender, and Educational Status. Most Farmers Who Attempt Organic Agriculture are Aware of Common Risks Related to Agriculture are Thus They Adopt Natural Mechanisms in Producing Agricultural Products. Further, the Main Incentive of Farmers to Switch to Organic Farming was not Environmental. Also Decok [15] has Analyzed the Factors of Switching to Organic Agriculture in Belgium; Findings of Regression Analysis Shows that the Tendency of Traditional Farmers Towards Switching to Organic Agriculture is Accounted For by Variables Including Social Environment Perception, Interest in Environment, and Access to Organic Product Standards.

Results of a Study by Malek Saeidi et al [16] Entitled “An Investigation of Factors Affecting the Knowledge of Experts of Khuzestan Jihad Agriculture Organization on Organic Agriculture” Indicates Direct Impact of Factors Such as Access to Agricultural & Environmental Information and Job Experience on Experts’ Knowledge of Organic Agriculture, and the Variables Attitude Towards Health and Attitude Towards Would Increase the Knowledge of Organic Agriculture Through Affecting Individuals’ Overall Environmental Attitude. Findings of a Study Conducted by FathiMahvizani et al [17] Entitled “Investigating the Knowledge and Attitude of Experts of Jihad Agriculture Ministry As to Organic Agriculture” Suggested that the Variables Healthy Environment, Fair Trade, and Degree are More Effective than Other Variables on Experts’ Attitude Towards Organic Agriculture.

The Research Hypothesis that “Environmental Requirements, From the Standpoint of Managers of Agricultural Engineering & Technical Consulting Service Cooperatives in Iran, Have an Impact on the Development & Extension of Organic Agriculture” is Confirmed. Findings of the Present Study are Consistent With Those Obtained by Saei [13]), Fathi Mahvizani et al [17], Malek Saeidi et al [16], De Cock [15], However, Findings Kubala, J et al [14]and Farajollah Hosseini & Ajoudani [12] Indicate a Negative Significant Relationship With this Indicator.

The Main Environmental Challenges of the Development & Extension of Organic Agriculture In Iran: From the Standpoint of the Managers of Agricultural Engineering & Technical Consulting Service Cooperatives in Iran, Currently the Development and Extension of Organic Agriculture in Iran is Facing With the Following Problems and Challenges: 1. Industrial & Chemical Contamination in the Margin of Agricultural Lands 2- Failure to Manage the Collection of Agricultural Lands for Organic Agriculture 4- Uncontrolled Use of Chemicals and Lack of a Biological Method for Controlling Pests 5- Potential Problems With Controlling Weeds, Pests and Plant Disease on the Farm. 6- Shortage of Land Free From Chemicals, Fertilizers, and Pesticides 7- It is not Clear Who is the Main Authority in Charge of Monitoring the Pollution of Farms and Natural Resources Nationwide 8-Drought and Severe Shortage of Water Supply for the Cultivation of Organic Farming.

Suggestions

Given the Results Obtained, a Significant Association, and the Impact of the Environmental Requirements on Organic Agriculture Development & Promotion, Making Efforts and Operationalizing the Suggestions Below by the Institutions and Organizations Concerned in Organic Agriculture is Recommended: 1- Encouraging Farmers to Take Advantage of Eco-Friendly Technologies 2- Monitoring the Process of Biological Control of Pests, Weeds, and Plant Diseases on the Farm by Supervising Experts in Private Sector and Cooperatives. 3- Raising the Participation of the Public and Farmers to Protect Biodiversity 4- Strengthening Non-Governmental Organizations (NGOs) in the Area of Environmental Management 5- Providing Organic Product Producers with Subsidy- Liable Fertilizer. 6- Adoption of Integrated Pest Management (IPM) and Biological Control of Plant Diseases. 7- Recycling Agricultural Product Waste by Beneficiaries. 8- Approval and Enforcement of Inhibitory Rules in Order to Protect Plant, Animal, and Aquatic Species.

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