

Original Research Article

Factors influencing the conversion to organic farming in Gaza strip

ABSTRACT

Aims: The agriculture industry in the Gaza strip consumes huge amounts of agrochemicals. This has caused several negative consequences on environment and health. Shifting to organic farming is recognized as a promising solution for this problem. The building of proper policies for the promotion of organic farming should be based on good understanding of the factors that affect farmers' decision to shift to organic farming. This study aims at defining the determinants of farmers' decision to convert to organic agriculture in the Gaza strip.

Place and Duration of Study: The analyses of this study are based on data of 100 randomly-selected vegetables farmers in southern Gaza strip. Data was collected in 2013 in Arabic language using a standard questionnaire and focus group discussion.

Methodology: Based on previous studies and focus group discussions, the study hypothesized three factors as the potential determinants of farmers' decision to convert to organic farming. The potential determinants are the socioeconomic and the demographic characteristics of farmers; attitudes towards organic farming; and the perceived economic performance of organic farming.

Farmers were categorized into two groups based on their intention to convert to organic farming. Logit regression is then applied to test the hypothesized determinants for their power as predictors of farmers' conversion decision.

Results: The estimated logit regression model shows that attitude towards organic farming and farmers' education can be good predictors of the intention of conventional farmers to convert to organic farming. Results suggest that farmers with higher education level and better attitudes towards organic farming are more likely to convert.

Conclusion: The study proved the significance of education and awareness on environmental issues affecting the farmers' conversion decisions. Therefore, policies for promoting organic farming should take into consideration noneconomic and non-technical factors to enable wider transition from conventional to organic farming.

Keywords: conversion determinants, attitudes, organic agriculture, perceived economic performance, logit model, conventional farming, Gaza strip.

1. INTRODUCTION

Intensive agricultural production systems have put a significant pressure on natural resources and caused continuous increase of agrochemicals application. This has resulted in a considerable damage to natural resources and created serious environmental pollution and health hazards. Organic farming became recognized by farmers, policymakers and consumers as one of the possibilities for the farmer to farm in a more sustainable way [1].

Organic agriculture has achieved immense growth in developing countries. It however, still has a great potential even in leading countries such as Uruguay which cultivates only 6.26 % of its arable land organically [2]. In several developing countries, organic agriculture is at a very early stage of the application. Gaza strip is one of the locations where intensive agrochemical application is a dominant farming practice. Gaza farmers lack the sufficient land and are therefore under economic obligation to intensify their production system by using an increasing amount of chemical fertilizers and pesticides. The amount of registered pesticides coming into Gaza through legal crossings during 2009 was around 646 tons [3]. Studies on agrochemical effects in Gaza strip demonstrated the link between the intensive use of pesticides in agriculture and health complications to farmers and their families [4, 5]. Organic farming is therefore recognized as an urgent need to minimize agrochemical applications and the associated health and environmental risks.

This study is part of a wider research project that investigates potentialities of organic farming in the Gaza strip. The research follows holistic approach to analyze potentialities at three integrated levels. First level is the farm level where investigation of economic performance of organic farming vs conventional farming is conducted. Analyses at this level investigate factors that influence farmers to convert to organic farming. The second level studies the marketing potential of organic products through questioning consumers' preferences and willingness to pay extra for organic products. The third level is a review of possible institutional frames for monitoring and certification of organic products and it examines the optimal model that fits production and marketing settings in the Gaza strip.

Organic farming is not practiced at commercial scale in Gaza strip. Some NGOs run small organic farms models with the aim of promoting the concept. Their production is too small and usually marketed at the farm or in a small shop in Gaza city. Promotion of organic farming would need wider adoption by market-oriented farmers. In this context, conversion to organic farming is seen as an individual decision problem where the individual farmer decides to change his existing farming practice and accepts the organic production standards [1]. Conversion to organic farming is, this way, compared to the adoption of a 'new' idea or innovation on the farm [6].

Knowledge about the factors that affect farmers' decision to convert to organic farming is a prerequisite for the formulation of policies for the support of a widespread transition from the current situation to the wished for safe organic agricultural practices. This study aims at defining the factors that affect farmers' decision to shift to organic farming in the Gaza strip. The study is based on a data of 100 vegetables farmers from southern Gaza and applying logit model analyses.

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2. LETRITURE REVIEW

Several studies have discussed factors that influence farmers' decision to shift to organic agriculture. The studies described a wide range of factors including socioeconomic and demographic characteristics of farmers; farmers' knowledge, perceptions, attitudes and commitments towards organic farming; and economic potential of organic farming. Such set of factors, however, were different in different socioeconomic and sociocultural settings.

A British study used logit model analyses to define factors that affect farmers' conversion decision in UK [7]. The study found that organic horticultural producers are more likely to be younger, run smaller enterprises and be female than their conventional counterparts. It also stressed the fact that non-economic aspects have a significant effect on conversion decision. Similar study in Norway used logit model to determine conversion factors. It indicated that organic farmers, compared to their conventional counterparts, are more likely to have larger

74 farms, more education, be located closer to urban areas, be crop farmers, have 'sustainable
75 and environment-friendly farming' as a goal and hold favorable views about the values of
76 organic farming methods [8]. In the USA, a similar study found that gross sales, direct
77 marketing, number of crops and acres, farmer age, and computer usage are significant
78 determinants of conversion decision [9].

79 Studies on determinant of organic agriculture were not restricted to developed countries. In
80 Bangladesh, a study using a logit regression model to identify factors that affect consumers'
81 decision to convert to organic farming showed that perceptions of organic farming,
82 household access to extension services, number of family laborers and household income
83 were significantly associated with decisions to adopt organic farming [10]. Another study in
84 Nepal suggests that farmers located in a distance from regional markets, older in age, better
85 trained, affiliated with institutions and having larger farms are more likely to adopt organic
86 production. The same study found that environmental awareness, bright market prospects,
87 observable economic benefit and health consciousness are the major factors influencing
88 farmers' decisions on the conversion to organic production [11].

89 De Cock hypothesized several determinants of the intention to convert to organic farming [1].
90 The determinants include attitude towards organic farming, the perceived attitude of the
91 social environment towards organic farming (or social pressure), the perceived feasibility of
92 organic farming standards; business and personal objectives between organic and
93 conventional farmers; and organic farming information seeking behavior. Each determinant
94 was presented as a set of statements in the questionnaire. The farmers' responses to these
95 statements were averaged and used as an indicator of attitudes for both conventional and
96 organic farmers. The study shows the relevance of these determinants through the
97 application of an ordinal regression model.

98

99 **3. METHODOLOGY**

100 **3.1 Study areas**

101 The Gaza Strip lies on the southern part of the eastern coast of the Mediterranean Sea with
102 a coastline of 40 km. Gaza borders Israel to the north and east (51 km long), and Egypt to
103 the South (11 km long) with an area of approximately 363 square km (The Applied Research
104 Institute Jerusalem [12]. The analyses for this study are based on data from a random
105 sample of 100 farmers in Western Rafah which is located in the western part of southern
106 Gaza. The economic environment of the study area relies strongly on agricultural production,
107 especially vegetables production.

108 **3.2 Sampling and data collection**

109 Data were collected from farmers through family survey using standardized questionnaire.
110 Initial list of 300 farmers who reside in western Rafah area was the basis to the randomly
111 selected 100 farmers. Additional 50 cases were selected as a replacement for the not
112 available or the not willing respondents. Two cases out of the 100 were excluded as they
113 gave extreme and inconsistent answers.

114 The questionnaire was designed to serve the broader context of the study. It covered a wide
115 range of issues including economic performance of farming activities and farmers'
116 perceptions and attitudes towards organic farming. Additionally, it covered demographic and
117 socioeconomic characteristics of farming families. A focus group discussion was conducted
118 to initially explore potential determinants of conversion decision. The focus group discussion
119 was conducted with a group of 12 vegetables farmers in the study area. The findings of the
120 focus group discussion guided the questionnaire structure.

121 **3.3 Explanatory variables and hypotheses**

122 Based on the literature review and the focus group discussion, the study hypothesized three
123 major explanatory variables that are believed to determine farmers' decision to convert to
124 organic farming. These are socioeconomic and demographic characteristics of farmers;
125 attitudes towards organic farming and its impact on health and environment; and the
126 perceived economic performance of organic farming.

127 **3.3.1 Socioeconomic and demographic characteristic:**

128 As suggested by previous studies farmers' wealth status, education, age, family size, farm
129 size, farm assets (assessed through size of owned greenhouses in this study) and
130 diversification of farm activities were found to have an influence on farmers' decision to
131 convert to organic farming. The study pre-hypothesized all these factors in the initial list of
132 determinants. However, descriptive comparative analyses of these factors between farmers
133 who are willing to convert and those who are not willing has resulted in the elimination of four
134 of these factors. The eliminated factors were not statistically significantly different between
135 the two groups [13]. Therefore, only three of them were considered for further logit model
136 analyses. The factors used are family income, education and farm size. The assumption is
137 that wealthier farmers with relatively higher education and bigger farms are more likely to
138 convert to organic farming. This implies that all these factors are expected have positive
139 relationship with the likelihood to convert to organic farming, and therefore, are hypothesized
140 to have positive sign in the logit model.

141 **3.3.2 Attitudes towards organic farming:**

142 The hypothesized determinant was presented to the interviewed farmers through three
143 statements in the questionnaire. On a Likkert scale from -2 to 2, (-2= strongly disagree and 2
144 = strongly agree) the farmers were asked how much they agreed with the different
145 statements about organic farming [1]. The statements are: Organic farming ensure healthy
146 work environment for farmers, Organic farming conserve soil and other natural resources,
147 Organic farming produce health-safe food.

148 Average answers were used to describe farmers' attitudes towards organic farming and its
149 impact on health, environment and food safety. The averages were calculated for both
150 groups of farmers who are willing and not willing to convert. Comparison between the two
151 groups is presented in the results. To define an attitude towards organic farming-index, the
152 answers were rescaled from 1 to 5 and a high score reflects a positive attitude [14] cited by
153 [1].

154 **3.3.3 Perceived economic performance of organic farming**

155 Farmers are presented with four statements to assess their expectation on the economic
156 performance of organic farming. The statements are Organic farming has lower production
157 costs; Organic farming has high product prices; Organic farming has high market demand;
158 Organic farming produces high yield. The same analyses approach as the above described
159 determinant was applied to assess farmers' perceived economic performance of organic
160 farming.

161 **3.4 Logit model**

162 Logistic regression model was applied to test the impact of the pre-hypothesized
163 determinants on farmers' decision to convert to organic farming. In this case, the dependent

variable which is the intention to convert to organic farming is described by a categorical variable, while the explanatory variables are continuous and categorical. Probability models such as logit and probit are the most frequently used regression models in socio-economic applications to investigate such situation of binary dependant variables [15, 16, 17, 18]. In this case, dependent variable is a dummy variable representing farmers' intention to convert to organic farming. The analysis has a straightforward statistical tests, with a high capacity to incorporate non-linear effects and wide range of diagnostic power [19]. The dummy conversion willingness variable was analysed against the pre-mentioned hypothesized explanatory factors.

The model can be expressed by the following form:

$$L_i = \ln \left(\frac{P_i}{1 - P_i} \right) = Z_i$$

Where L_i = log of odds ratio

P_i = the probability of converting to organic farming for the i^{th} farm.

$1 - P_i$ = the probability of not converting to organic farm for the i^{th} farm

$$P_i = \frac{1}{1 + e^{-Z_i}}$$

Where the value of Z_i is calculated with the following function

$$Z_i = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5$$

Where;

B_0 = The intercept

B_1, B_2, B_3, B_4, B_5 = The slope parameters of the model which measures the change in L_i for a unit change in the explanatory variables Hence, it tells how the log-odds in favour being converting as the value of the variable X_i changes by a unit.

X_1 = Farm size (in dunum =0.1 Hectare)

X_2 = Family monthly income (1NIS=0.29 US\$)

X_3 = Education (illiterate, elementary, middle, high, University)

X_4 = Farmers' attitudes towards organic farming (calculated average)

X_5 =Farmers expectations on economic performance of organic farming (calculated average)

The suggested model is testing the following null-hypotheses:

1. There is no relationship between the farmers' decision on converting to organic farming and any of the pre hypothesized variables listed above.

194 2. Farmers' decision on converting to organic farming is not affected by any of the
195 suggested factors.

196

197 4. RESULTS AND DISCUSSION

198

199 4.1 Sample description

200 The age and the gender compositions of a family determine the availability of labour for the
201 various activities undertaken by the family [20]. The average family size of the interviewed
202 sample is 7 while the average number of adults is 3. Usually, field work in the Gaza strip is
203 neither gender nor age restricted as women and children participate in the farming activities
204 as well [17]. Results revealed that 52% of the interviewed farmers rely on family labor as
205 major source for farm human resources while 24% hired labors on constant base and 23%
206 hire seasonal labor to perform farm activities. Shifting to organic farming requires more
207 labourers [10, 21]. Therefore, family size was hypothesized as potential determinant of
208 decision to convert to organic farming.

209 Results revealed that 24% of the interviewed farmers have low education as they did not
210 attend middle or high school, 20% completed middle school while around 39% completed
211 high school. Only 17% of interviewed farmers obtained university degrees. Education is a
212 major determinant in conversion to organic farming in particular [8].

213 All the interviewed farmers run vegetables production in their farms. However, not all of them
214 considered it as their major source of income. 49% of the interviewed farmers stated their
215 major career as plant production farmers while 16% of them considered livestock production
216 as the main occupation. The remaining 35% stated off farm activities as their major source of
217 income. This indicates the significance of vegetables production as major sources of income
218 for at least half of the interviewed farmers. Integration between plant production and animal
219 production represents good potential for conversion to organic farming as plant production
220 under organic farming depends on manure to fertilize crops and produce compost.
221 Diversified farm activities encourage farmers to take innovation risks. Therefore, it was
222 included as hypothesized determinant for farmers' decision to convert to organic farming.

223 Almost all of the interviewed farmers ranked themselves in income categories that have
224 income less than 2000 NIS a month. 52% of them had an income of 800 NIS or less per
225 month. Such figure reflects very low living standard or at least as farmers see themselves as
226 very poor and needy. Family income was proved to be a major determinant of farmers'
227 decisions to convert to organic agriculture [10]. Therefore it was considered as a potential
228 conversion determinant.

229 Farmers in the study area varied in their farm size. However, farm size in general is small as
230 87% of the interviewed farmers operate less than half hectare and 98% of them have less
231 than 1 hectare. The small size of the operated land reflects the need to intensify production
232 to generate sufficient income for farming families. This implies the need to apply intensive
233 agriculture techniques which rely, to wide extent, on the use of chemical fertilizers. Cost
234 structure of vegetables crops shows that 40% of the variable costs are spent on
235 agrochemicals including chemical fertilizers, pesticides and soil sterilizers. This indicates the
236 potential technical complications for shifting to organic farming in small farms. Farm size was
237 frequently identified as major factor that affect farmers decision to convert to organic farming
238 [8, 9]. Therefore, farm income was considered as a potential determinant of farmers'
239 decision to convert.

240 4.2 Comparative analyses

241 Farmers are classified based on their intention to shift to organic farming into two groups.
 242 The first group consists of 68 farmers who wish to convert to organic farming while the other
 243 group of 30 farmers is not willing to convert. The pre-hypnotized explanatory variables are
 244 presented for both groups to illustrate differences between them.

245 4.2.1 Socio-economic and demographic characteristics

246 Table 1 presents a comparison between farmer who are willing to covert and those who are
 247 not willing in term of five continuous variables. Results indicated that famers in the two
 248 groups are not different in terms of age, family size or farm assets. Based on this results
 249 farmer age, family size and farm assets will not be considers in the logit model. Both family
 250 income and farm size will be included. On the other hand, results indicated that farmers who
 251 are willing to convert have significantly higher family income and land sizes.

252 Education level of farmer and diversification of farming activities were presented in a
 253 categorical form. Farmers with only vegetables production activities were categorized as
 254 plant production farmers while farmers who integrate one type of livestock production in their
 255 farm were described as mixed farmers. Farmers with more than one livestock production
 256 type are categorized as diversified farmers. Results of comparative analyses indicated that
 257 diversification of farm activities was not significantly different between the two groups.
 258 Therefore, it was not considered for further analyses in the logit model.

259 **Table 1: Socioeconomic and demographic characteristics of vegetables farmers**
 260 **across farmers groups accepting and rejecting organic farming**

FARMERS GROUP	ACCEPTING GROUP	REJECTING GROUP
% of families	30	70
Family size	7 ^a (±0.57)	6.57 ^a (± 0.92)
Age of farmer	42 ^a (±2.25)	40 ^a (±3.07)
Land size (dunum = 0.1ha)	3.33 ^a (± 1.26)	1.37 ^b (±0.3)
Size of owned greenhouses (ha)	0.84 ^a (±0.4)	0.53 ^a (±0.2)
Monthly family income (NIS= 0.29 US\$)	673 ^a (± 135.6)	289 ^b (± 153.9)

261 *Figures in parentheses are 95% confidence interval of the mean*

262 *a,b Groups with similar letters have no significant difference at 95% and groups with different*
 263 *letters have significant difference according to Mann-Whitney test.*
 264

265 Education level of farmers who are willing to convert to organic farming is significantly higher
 266 as compared to the group of farmers who are not willing to convert. As shown in figure 1,
 267 100% of the illiterate farmers and 80% of farmers with elementary school education level are
 268 located in rejecting farmers group. In contrast, 80%, 92% and 83% of relatively higher
 269 education levels belong to the accepting farmers group. The differences were statistically
 270 significant between the two groups. Education therefore is considered for the logit model
 271 analyses.

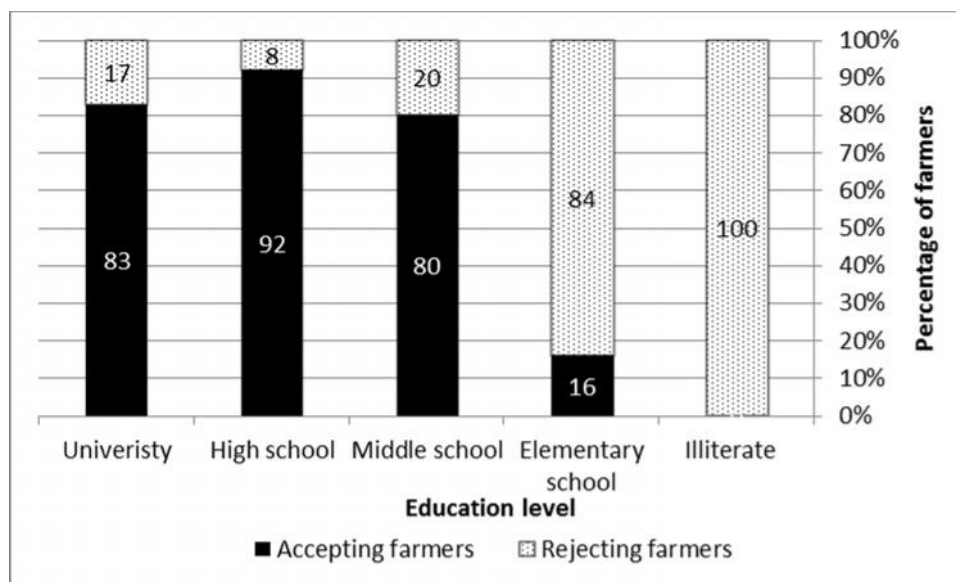


Figure 1: Education level among farmers groups.

4.2.2 Attitudes towards organic

Farmers are presented with three statements on the effect of organic farming on health and environment and asked to rate their level of agreement on them using the Likkert scale. Table 2 shows the average sample scores for each statement of both accepting and rejecting farmers groups. Also, it presents the calculated total average score that represent the overall attitude towards organic farming across the two groups of farmers. As shown in the results, the perceived attitude towards organic farming is significantly different between accepting and rejecting farmers groups. Rejecting farmers are still, to certain extent, believe in the positive impact of organic farming on conserving natural resources with an average score >3. Their total attitude score is 3.1 which reflect neutral attitude towards organic farming. Accepting farmers group however, has significantly better attitude towards organic farming. This was obvious in average scores on each statement as well as the total calculated score for both groups that differed significantly. The calculated total score is calculated for each respondent separately and thus are aggregated to calculate the total score presented in table 2.

Table 2: Average sample score for different statements reflecting perceived attitude towards organic farming across the farmers groups

FARMERS GROUP	ACCEPTING GROUP	REJECTING GROUP	P- VALUE
% of families	30	70	
Organic farming ensure healthy work environment for farmers	3.76 ^a (1.11)	2.97 ^b (0.72)	0.000
Organic farming conserve soil and other natural resources	4.16 ^a (0.78)	3.63 ^b (0.96)	0.000
Organic farming produce healthy safe food	4.41 ^a (0.63)	2.8 ^b (0.89)	0.005
Total score of perceived attitude towards organic farming	4.1 ^a (0.53)	3.1 ^b (0.62)	0.000

Standard deviations in parentheses.

^{a,b} Groups with similar letters have no significant difference at 95% and groups with different letters have significant difference.

4.2.3 Perceived economic performance of organic farming

Similar approach of presentation, rating and calculation was applied to assess farmers' attitude towards economic performance of organic farming. Results on farmers perceived economic performance is presented in table 3.

Both groups believed that organic farming will reduce their production costs as their average scores exceed 4. Still, the accepting group farmers have significantly higher score on this statement. Expectations on higher price for organic products were >3 for both groups with significant higher scores for accepting group. Rejecting farmers group has low average score of less than 2 on the statement 'Organic farming has high market demand'. The average score was significantly higher for the accepting farmers group. Both groups were similar in their low average score on production expectation. As shown in table 3, there was no significant difference between the two groups in their average score.

The calculated total average was significantly different between the accepting and the rejecting groups. Total score for the rejecting farmers was <3 which reflects their expectation of low economic performance of organic farming. The score was significantly higher for the accepting farmers which reflect relatively positive expectation on economic performance of organic farming.

Table 3: Average sample score for different statements reflecting the perceived economic performance of organic farming across the farmers groups

FARMERS GROUP	ACCEPTING GROUP	REJECTING GROUP	
% of families	30	70	
Organic farming has lower production costs	4.59 ^a (6.29)	4.03 ^b (1.06)	0.002
Organic farming has high product prices	3.78 ^a (1.25)	3.07 ^b (1.17)	0.01
Organic farming has high market demand	3.78 ^a (1.28)	1.43 ^b (0.68)	0.000
Organic farming produces high yield	1.57 ^a (0.63)	1.47 ^a (0.63)	0.441
Total score of perceived economic performance of organic farming	3.21 ^a (0.47)	2.6 ^b (0.37)	0.000

^{a,b} Standard deviations in parentheses.

^{a,b} Groups with similar letters have no significant difference at 95% and groups with different letters have significant difference.

4.3 Results and interpretation of logit model

As shown in table 4, the Omnibus test has a highly significant value which gives a strong statistical justification to reject the null hypothesis, i.e. farmers' decision on converting to organic farming is not affected by any of the suggested factors. The model is able to correctly predict 83.3% of rejecting cases and 97.1% of accepting cases. The overall correct predation of the model is 92.9%. Based on these statistical evidences, one can accept the hypothesized factors as efficient predictors of organic conversion decision [22].

327 **Table 4: Logit regression results of the farmers' decision on conversion to organic**
328 **farming.**

Variables	Coefficient	S.E.	Wald	Sig.	Exp (B)
Intercept	-33.755	10.05	11.3	0.001	0.000
Education of farmer (categorical)	1.59	0.57	7.73	0.005	4.910
Land size (dunum=0.1 hectare)	0.001	0.001	2.75	0.097	1.001
Monthly income (NIS=0.29 US\$)	0.001	0.001	1.23	0.258	1.001
Attitude towards organic farming	3.962	1.203	10.85	0.001	52.55
Perceived economic performance of organic farming	4.235	1.61	6.91	0.09	69.05

Omnibus test of model coefficients: $\chi^2 = 86.52$ sig = 0.000

Percentage of correct predictions = 92.9 %

NagelkerkeR2 = 0.666

329 All the independent variables have the expected direction of relationship with the dependent
330 variable, i.e. the odds ratio of farmers' conversion to organic farming. The model indicates
331 that attitudes towards organic farming and education level have substantial effects on
332 farmers' decision to convert to organic farming. This is shown by the coefficients and level of
333 significance for these two factors in the logit model. This leads to the interpretation that
334 farmers' education and awareness on health and environmental issues have greater impact
335 on their decision to convert to organic farming than wealth status, land size or expectation on
336 economic performance of organic agriculture. The low significance of the coefficients for
337 farmers' wealth status, land size and perceived economic performance indicate the minor
338 role of those three factors in farmers' decision to convert to organic farmers.
339

340 4. CONCLUSION

341
342 Agricultural practices in the Gaza strip are, to a wide extent, dependent on the intensive use
343 of agrochemicals. This has caused serious negative implications on environment and health
344 of producers and consumers of the agricultural products. Shifting to organic agriculture is
345 therefore recognized as a possible solution to the problem. Dissemination of organic farming
346 in the Gaza strip needs further knowledge on the determinants that affect farmers decision to
347 convert to organic agriculture. Based on literature review and focus group discussion, the
348 study introduced three potential factors that can influence farmers' decision to convert to
349 organic agriculture. The factors are farmers' socio-economic and demographic
350 characteristics, attitudes towards organic farming and the perceived economic performance
351 of organic farming. Comparative descriptive analyses were used to initially assess the
352 suitability of these factors as potential conversion determinants. Among seven hypothesized
353 socio-economic variables, only three were significantly different between farmers who accept
354 organic farming and those who reject it. Family wealth, farm size and education level were
355 significantly different between the two groups of farmers. Similarly, comparative analyses
356 showed that accepting farmers group has significantly better attitude towards organic
357 farming and its role in protecting the environment and health. Farmers' expectations on the
358 economic performance of organic farming were also different between the two farmers
359 groups. Accepting farmers group has significantly higher expectation on economics
360 performance of organic farming when compared to the rejecting farming group.

361

The estimated logit regression model shows that the attitude towards organic farming and farmers' education can be used as a strong predictors of the intention of conventional farmers to convert to organic farming methods. Other factors such as farm size, family income and farmers' perception of economics of organic farming were found to be of a less importance when determining conversion decision. The results suggest that farmers with higher education level and better attitudes towards organic farming are more likely to convert to organic farming.

Improving farmers' knowledge on organic farming and its positive impact on environment and public health are of equal or even higher importance than solving the economic challenges of organic farming. Thus policies for promoting organic farming should take into consideration noneconomic and non-technical factors to enable widespread adaption of organic farming.

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