

REFEREED CONFERENCE PAPER¹**AN INVESTIGATION INTO THE DETERMINANTS OF COMMITMENT TO ORGANIC FARMING IN IRELAND***Mary McCarthy, Seamus O' Reilly, Aoife O'Sullivan and Patrick Guerin*

A dramatic increase in the number of organic farmers in Ireland since the introduction of financial support under successive agri-environmental programmes prompted us to investigate farmer motivations to convert to organic farming and to continue as organic farmers. An adapted Theory of Planned Behaviour (TPB) framework proved useful to investigate farmer motivations and behaviour. The findings support the TPB hypothesis in that behavioural intention (commitment to organic farming) was related to attitude, the influence of important others and the level of perceived behaviour control. The addition of self-identity and moral obligation measures in the regression increased the predictive power of the model, signifying that these two variables are important predictors of commitment. The organic farmers were segmented based on their level of commitment to organic farming, three segments were identified: wary, finance wary; and very committed. The findings point to an evolution in the type of organic farmer from a small-scale farmer very focused on environmental and agro-ecological issues to a larger-scale more commercially orientated farmer. However, the majority of full-time Irish organic farmers displayed a strong moral obligation to the environment and their continued commitment to organic farming was influenced by growing consumer demand for high quality healthy food products. Part-time organic farmers were found to be rather wary as to the future potential of organic farming.

Key words: Organic farming; theory of planned behaviour; farmer's attitudes and motivations; Ireland.

Introduction

Organic farming is an alternative sustainable production system which places highest emphasis on ecological protection. Organic cultivation is dominated by an environmental ethos, giving particular importance to animal welfare considerations and discouraging the use of synthetic chemical inputs throughout the farming practice. For truly committed organic producers, it is more of a personal belief system and a way of life rather than a business investment (Kaltoft, 1999). A general respect for nature and its contribution to the overall wellbeing of society, as noted by Schoon and Grotenhuis (2000), is a fundamental driving force behind ecological farming.

International research has richly documented the various issues affecting organic production; such research ranging from personal motivating beliefs to external policy support (Allen and Bernhardt, 1995; Beus and Dunlap, 1990; Dubgaard and Sorensen, 1988; De Buck *et al.* 2001; Fairweather, 1999; Lampkin, 1994; McEachern and Willock, 2004; Michelson, 2001; Padel, 2001, Padel *et al.*, 1999; Schoon and Te Grotenhuis, 2000; Sullivan *et al.*, 1996; among others). Policy and government intervention schemes, like REPS SM6, have stimulated ongoing debate over the motivational factors associated with organic production. Conversion to organic farming has been described by Padel (2001) as "a complex system change" which challenges conventional farm practices and values. Thus, Irish organisations like the Western

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Development Commission (WDC) and the relevant organic certification bodies strongly urge farmers on the brink of conversion to be thoroughly committed to the process itself, rather than the potential financial gains associated with the REPS scheme (WDC, 2001; Teagasc 2003).

Comer *et al.* (1999) considers that the adoption of sustainable practices is dependent on a farmer's socio-economic characteristics and beliefs. Literature has put forward a profile of the organic farmer as being typically from an urban background, with a high level of education, less farming experience due to their younger age, more tolerance in approach, and possessing strong inclinations towards providing quality production (in terms of food produce, health, the wellbeing of animals and also for society as a whole), (Duram, 1999; Egri, 1998; Lampkin and Padel, 1994; Lockeretz, 1997; Michelsen, 2001; Schoon and Te Grotenhuis, 2000; Tovey, 1997, among others).

Organic farmers seem to demonstrate a strong sense of ethical commitment, a meaningful relationship with the land, and a greater sense of community, (Sullivan *et al.* 1996). Schoon and Te Grotenhuis (2000) consider that many motivating factors influence a farmer's production choice and it is not an isolated category of reasoning stimulating the outcome. However, production influences can be viewed in two general categories: personal and farm-related motives (Egri, 1999; Padel, 2001).

Personal motives are usually borne from health concerns for the family, consumers and livestock (Lockeretz and Madden, 1987; Bruckmeier *et al.*, 1994). Furthermore, general personal motivations include conservation, philosophical view of the environment, food quality, professional challenge, spousal influence, and rural or community development (Fairweather, 1999; Padel, 2001; Sullivan *et al.*, 1996). Farm-related motives encompass common husbandry aspects and financial incentives. Early studies found that economic benefit, for the most part, is not regarded as a strong motivating factor (Dubgaard and Sorensen, 1988). However, later studies have suggested that producers now perceive organic methods as an increasingly profitable and viable option. Thus, financial motives are emerging as a more dominant influence in organic production, (Offerman and Nieberg, 2000; Padel, 2001; Willcock *et al.*, 1999).

Conventional farmers differ somewhat in their attitudes towards production. Usually the main objective for conventional producers is to maximise profits, manage the land efficiently, view the farm as an investment that can be carried forward to the next generation, and quality, vis-à-vis control over the production process to ensure food taste and superior farm structure/appearance, (Egri, 1999; Fairweather, 1999; Padel, 2001; Schoon and Te Grotenhuis, 2000). Interestingly, Sullivan *et al.*, (1999) report higher stress levels in conventional farmers than in alternative producers as the former feel a greater concern for financial aspects, citing stress as a major drawback of farming.

Conservative attitudes are gradually evolving towards organic production as a result of improved financial support through agri-policy programmes and external market influences (Michelsen, *et al.* 2001; McEachern and Willock, 2004). Agri-environmental schemes offering support packages and premium prices have acted as a catalyst for organic conversion. The Rural Environment

Protection Scheme (REPS) under EU Regulation 2078/92, introduced in 1994, encouraged the development of organic production under the Supplementary Measure 6 (SM6). In fact the number of Irish organic farmers has grown quite rapidly since the introduction of REPS SM6 from only 195 in 1994 to 923 registered organic farmers (747 had attained full organic status with 176 in conversion) in 2002 (DAF, 2004). Furthermore, the acceptance on the part of the consumer for organic products as a safer healthier option has opened up market opportunities for agricultural producers. This has been coupled with an increasing desire to adopt a more holistic philosophical approach to farming. Despite potential barriers to entry – the perceived lack of information and support, consumer apprehension to pay premium prices for organic produce, uncertainty about the supply chain, etc. (Baecke and Rogiers, 2002) – the Irish organic market continues to strengthen and develop. Thus, in order to address future market trends, producers' attitudes, beliefs and motives need to be identified and understood.

Objectives and Research Framework

A dramatic increase in the number of organic farmers in Ireland from a very low base in the early 1990s prompted some commentators to categorise Ireland as a 'potential' country for organic farming development. Much of this growth coincided with the introduction of subsidies for organic farmers under successive agri-environmental programmes. This prompted us to investigate farmers' motivation to convert to organic farming and to continue as organic farmers. We were also interested in the usefulness of the Theory of Planned Behaviour (TPB) in investigating farmer motivations, and thus we adapted this framework to include moral obligation and self-identity.

The primary focus and the first objective of this study is to establish the degree to which the personal, farm and financial motives have influenced organic farmer commitment to this production method. Thus we sought to identify a change in farmer motivation to convert to organic farming in recent years. Furthermore the constraints for remaining in organic farming are considered. To achieve this objective the Theory of Planned Behaviour (TPB) was used to guide the research. This theory, an extension on the Theory of Reasoned Action (TRA), argues that the intention of an individual to perform a behaviour is determined by their attitude to the behaviour (A_j), the influence of the views of important others (e.g. friends and family) on that behaviour (SN) and the level of perceived behaviour control (PBC) that they have over the performance of the behaviour. Thus in the case of organic farming the intention is the level of commitment to remain in organic farming, while attitudes reflect their instantaneous views when asked about organic farming, the influence of important others, while perceived control is linked to a lack of perceived capability, support and information to produce organic products. The models associated with this research are specified as followed.

$$BI(\text{commitment to organic farming}) = w \cdot A_j + w \cdot SN \quad (\text{TRA}) \quad (1)$$

$$BI(\text{commitment to organic farming}) = w \cdot A_j + w \cdot SN + w \cdot PBC \quad (\text{TPB}) \quad (2)$$

Where w represents the relative weightings of the various variables as

derived from the multiple regression (Shepherd and Sparks, 1994).

According to Azjen and Fishbien (1980), the original proposers of the TRA, attitude toward a behaviour is determined by the sum of the product of salient beliefs by outcome evaluations. Salient beliefs (b_i) are the beliefs that the individual hold about a product or action and the outcome evaluations (e_i) reflect whether the outcome of such actions are viewed a positive or negative.

$$A_j (\text{attitude toward organic production}) = \sum b_i * e_i \quad (3)$$

Furthermore, subjective norm (SN) is determined by normative beliefs (NB) about the product or action (i.e. what the individual believes others in society think about organic farming) by the individual motivation to comply with those beliefs (Mc).

$$SN (\text{Subjective norms}) = NB * Mc \quad (4)$$

In the case of organic farming it is clear that, for many farmers, the decision to become an organic farmer may be influenced by a desire to maintain or improve the environment, thus a sense of moral obligation could also be a significant determinant of intention to remain in organic farming. Also, organic farming can be a lifestyle decision and the farmer may see himself/herself in a certain manner which is congruent with being an organic farmer, this also could influence intention to remaining in organic farming. Thus extensions to the TPB are considered. The extensions included are perceived moral obligation (MO) and self identity (SI).

$$BI (\text{commitment to organic farming}) = wA_j + wSN + wPBC + wMO + wSI \quad (5)$$

The second objective of this research was to establish if, due to the changing supports for organic production, a variety of segments of organic farmers exist based on their levels of commitment.

Methods

As the target of this research was organic farmers a list of organic producers was generated from the three approved certification bodies. A postal questionnaire was circulated to 923 registered organic farmers and 252 valid questionnaires were returned. Substantial piloting of the questionnaire was complete prior to distribution.

The design of the statements was guided by the work of previous research in particular that of Beedell and Rehman (2000). Measures for behavioural intention (BI), attitude (A_j), behaviour beliefs (b_i), outcome evaluation (e_i), subjective norm (SN), normative beliefs (Nb), motivation to comply (Mc), perceived behavioural control (PBC), moral obligation (MO), and self identity (SI) were developed. In most cases seven point agreement scales were employed. In all cases multiple items were used to measure each construct and factor analysis using principle components was employed to identify the underlying data structure. To test the internal consistency of the scale items,

Table 1. Statements and constructs used for further analysis

Statements	Statements
BI - commitment ideology (SD to SA)* I cannot foresee any reason why I would leave organic farming I am determined to remain in organic farming	Subjective norm (SD to SA) <i>People important to me think I should avoid...</i> the use of synthetically compounded fertiliser the use of pesticides regular crop rotation
Aj (EB to EG)** Avoiding the use of synthetically compounded	NBMc *** <u>Personal</u>
Avoiding the use of synthetically compounded	Partner Family <u>External</u> Other Farmers Farm advisory Farming associations
Avoiding the use of pesticides is ... Regular crop rotation is...	Control (SD to SA) <u>Personal</u> <i>To continue organic farming I lack...</i> Expertise partner support family support <u>External</u> <i>To continue organic farming I lack...</i> adequate finances adequate subsidies
Belief-evaluation (SD to SA) <u>Production</u> Healthy working environment for farm workers Healthy working environment for self Healthy working environment for family Protecting the soil Protecting from water pollution Protecting the land Improve the quality of food Produce safer food Wellbeing of animals Health of animals Prevent diseases in animals <u>Survival-perceived viability</u> Cannot survive with subsidies Dependent on subsidies Survival with high margins <u>Costs</u> Reduced overall costs Reduced day to day running costs Higher returns from production	Moral obligation (SD to SA): <i>I feel a moral obligation to...</i> avoid the use of synthetically compounded fertiliser avoid the use of synthetically compounded fertiliser avoid the use of pesticides engage in regular crop rotation Self- identity (SD to SA) <i>I see myself as a...</i> reforming farmer progressive farmer innovative farmer

*SD to SA denotes that the scale ranged from Strongly Disagree to Strongly Agree

**EB to EG denotes that the scale ranged from Extremely bad to Extremely Good

***importance to a potential influencer of conversion* motivation to comply with the view of the potential influencer and thus reliability of the identified factors, Cronbach alpha scores were calculated. These scores were all acceptable and ranged from 0.757 to 0.936. Table 1 presents a summary of the items included to represent each part of the

model while table two presents summary of the mean score for each of these components as well as their reliability scores.

Findings

Table 2. Mean scores for all components of the model

	N	Maximum	Mean (μ)	SD	Cronbach's alpha
Commitment to organic farming	244	7.00	5.72	1.56	0.878
Attitude	249	7.00	6.33	1.01	0.757
<i>Production</i> (be_i)	250	49.00	40.09	7.05	0.871
<i>Survival</i> (be_i)	246	49.00	29.37	14.37	0.796
<i>Cost</i> (be_i)	249	49.00	31.62	9.50	0.699
Subjective Norm	246	7.00	5.53	1.48	0.936
Personal (NbMc)	234	49.00	21.28	11.82	0.868
External (NbMc)	235	49.00	7.09	11.51	0.781
Self-Identity	245	7.00	5.17	1.20	0.768
Moral Obligation	246	7.00	6.29	1.00	0.830
Control personal	244	7.00	5.58	1.41	0.797
Control external	244	7.00	3.63	1.86	0.807

The model

Regression analysis was used to assess the degree of association between the components of the model. Table 3 presents the regression results.

Two separate multiple regressions were performed on the belief elements of the model. The first multiple regression examined the effect of the behaviour belief (Σbe_i) products on attitude (A_j). Two of the three behavioural belief products were significant predictors of attitude ($R^2=0.298$, $p \leq 0.01$).

Beta-values (β) show the relative importance of production ($\beta=0.495$, $p \leq 0.01$) survival ($\beta=-0.255$, $p \leq 0.01$) and costs ($\beta=-0.017$, $p=0.782$) on attitude with attitude towards organic farming being positively associated with behavior beliefs about production, negatively associated with behaviour beliefs about subsidies and not significantly associated with behavioural beliefs about costs.

The second multiple regression examined the effect of the normative belief product ($\Sigma NbMc$) on subjective norm. The beta-values indicate a positive and significant association between personal normative belief and subjective norm

Table 3. Predictors of attitude, subjective norms and self-identity towards organic farming

		Beta	T	Sig.	R	F-test
Attitude	b*ei				0.298	29.04
	Production	0.495	8.303	0.000		
	Survival	-0.255	-4.289	0.000		
	Cost	-0.017	-0.277	0.782		
SN	Nb*Mc				0.144	18.77
	Personal	0.380	6.014	0.000		
	External	-0.007	-0.110	0.912		

at the 99% confidence level. Thus compliance with family ($\beta=0.38$, $p\leq 0.01$) views influenced the perceived social pressure (subjective norm) for organic farmer. However, compliance with outsiders views was not a significant influence on the subjective norm for organic farmers.

Table 4. Hierarchical Regression analysis model summary: Dependent-commitment to organic farming

Model	Independent variables	R ²	F-test
1	Attitude and subjective norm	0.248	37.01
2	Attitude, subjective norm, control personal and control external	0.314	25.53
3	Attitude, subjective norm, control personal, control external, moral obligation and self identity	0.443	29.35

To determine the contribution of the investigated variables to the variance in commitment (intention to continue organic farming), as set by TRA and TPB, hierarchical regression analysis was conducted. Attitude and subjective norm were first regressed against commitment (Table 4). This resulted in a reasonably good multiple regression coefficient of $R^2=0.248$. Both attitude and subjective norm contributed significantly ($p\leq 0.01$). The effect of attitude ($\beta = 0.347$) was positive as was subjective norm ($\beta= 0.279$).

Adding perceived behavioural control to the model as specified in the TPB model increased the predictive power of the model from $R^2=0.248$ to $R^2=0.314$ (Table 4). Both the *external* and *personal* behavioural control variables were positively associated to commitment at the 95%. Inclusion of a measure of self-identity and moral obligation in the regression increased the predictive power of the model to $R^2=0.428$, signifying that these two variables are important predictors of commitment. In this final model all constructs are significant at the 90% level (Table 5). Consequently, commitment to organic

farming is positively associated with attitude, self identity and moral obligation at the 99% confidence level and with subjective norm and personal and external control at the 92% confidence level.

In conclusion commitment to organic production is influenced by attitudes,

Table 5. Predictors of commitment to organic farming-final model

	Beta	t	Sig.	R ²	F-test
Commitment				0.44	29.35
Attitude	0.233	4.272	0.000		
Subjective Norm	0.114	2.011	0.046		
Control Personal	0.112	1.971	0.050		
Control External	0.097	1.810	0.072		
Moral Obligation	0.165	2.872	0.004		
Self Identity	0.328	5.674	0.000		

which in turn is influenced by belief-evaluations on the production system and long-term survival prospects in organic production, subjective norm, which in turn is influenced friends and family views, perceived behavioural control, perceived moral obligation and self-identity. In all cases more strongly held views increased the level of commitment.

Commitment segments

In the next stage of the research we were interested in assessing if organic farmers grouped out based on their level of commitment to organic production. In this context the grouping variables used consider commitment in the general sense (i.e. intention to continue organic farming) and commitment in the context of perceived overall financial viability. A further two statements were used to measure commitment based on overall financial viability: “without organic farming subsidies I would leave organic farming” and “organic producer must receive a higher price than conventional producers to support organic farming viability”. The scores on these two statements were summated and the combined mean score was used for the segmentation analysis. The mean score for the population for overall financial viability was 5.02. This suggests that generally the sample population were concerned about the viability aspects of organic farming.

Cluster analysis using K-mean clustering on these two commitment measures was completed. A range of cluster solutions (2 to 5) were examined and a three cluster solution was identified as best reflecting the differences in the sample population. The three clusters were named based on the distinguishing features of the clusters. Table 6 present details on the segmentation variable mean scores for each segment and highlight the

Table 6. Commitment segments: A comparison of commitment levels using ANOVA analysis with Post hoc Bonferroni

Variable (μ)	Segment (μ)	Segment	Mean difference	Post hoc Bonferroni P-value
Commitment ideology (5.72)	<i>Finance wary</i> (6.34)	<i>Wary</i>	3.10	0.000
Commitment ideology (5.72)		<i>Very committed</i>	-0.36	0.007
Commitment ideology (5.72)	<i>Wary</i> (3.23)	<i>Finance wary</i>	-3.10	0.000
		<i>Very committed</i>	-3.46	0.000
	<i>Very committed</i> (6.69)	<i>Finance wary</i>	0.36	0.007
		<i>Wary</i>	3.46	0.000
Overall financial viability (5.02)	<i>Finance wary</i> (5.59)	<i>Wary</i>	.134	0.904
Overall financial viability (5.02)		<i>Very committed</i>	2.08	0.000
Overall financial viability (5.02)	<i>Wary</i> (5.45)	<i>Finance wary</i>	-.134	0.904
		<i>Very committed</i>	1.94	0.000
	<i>Very committed</i> (3.51)	<i>Finance wary</i>	-2.08	0.000
		<i>Wary</i>	-1.94	0.000

significant differences in scores across the segments. The first cluster, the Finance Wary segment, accounted for 51% of the sample and while displaying strong commitment to organic farming they were significantly more concerned about finances than the totally committed segment (Table 6). The second cluster, the wary segment, accounted for 23% of the sample.

Table 7. A profile of the identified organic farmer segments

Variable	Level (Total sample %)	F.W.* (%)	Wary (%)	V.C.* (%)	Chi-square	P-value
Farming history – farm prior to organic farming N=243	Yes	(83)	89	82	71	9.235 0.01
Farming history – farm prior to organic farming N=243	No	(17)	11	18	29	
Farmer status N= 241	Full-time	(45)	48	30	52	6.56 0.038
	Part-time	(55)	53	70	48	
Years converted N=243	2000	(10)	15	4	8	18.72 0.005
	1994-1999	(73)	72	80	60	
	1980-1993	(12)	8	13	19	
	Before 1980	(6)	3	4	13	
Farm size N=232	Less than 50	(39)	29	46	53	15.35 0.018
	50-100 acres	(32)	40	25	23	
	101-150 acres	(21)	24	15	20	
	> 150 acres	(8)	7	14	5	
Farm type N=243	Dairy with other	(9)	6	14	10	23.87 0.008
	Beef	(41)	49	32	32	
	Sheep	(17)	16	29	10	
	Horticulture	(8)	5	7	16	
	Mixed	(20)	18	16	27	
	Other	(5)	6	2	6	
Farmers age N=243	≤40	(28)	21	38	35	9.88 0.042
	41 – 55	(53)	55	48	54	
	56+	(19)	24	14	11	
Nationality N=244	Irish	(78)	88	91	47	47.70 0.000
	Other	(22)	12	9	53	

* F.W. denotes Finance wary; V.C. denotes very committed

This segment displayed the lowest level of commitment to organic farming and was significantly less committed to organic farming than the other two segments, however their finance concern was similar to the finance wary segment. The third cluster, the totally committed segment, accounted for 26% of the sample and displayed good commitment to organic farming and were not as concerned about the financial issues associated with organics. An

examination of the profile of these segments presented some interesting insights into why the commitment levels varied. The segments were compared based on farming history, farming status (full-time vs part-time), years converted, farm size, farm type, farmers age and farmer nationality (table7). Chi-square analysis was conducted to see if significant differences existed across the groups and in all cases the groups were significantly different from each other at the 95% confidence level. Table 8 highlights the differences in attitudes and motivations of the segments. Table 9 presents the reasons why farmers converted to organic farming and table 10 presents the reasons why they remain in organic farming.

Table 8. A comparison of the segments based on attitudes and perceptions- ANOVA analysis with Post hoc Bonferroni

Variable	Segment	Segment	Mean Difference	Post hoc Bonferroni P-value
Attitude	<i>Wary</i>	<i>Finance wary</i>	-0.71	0.000
	<i>Wary</i>	<i>Very committed</i>	-0.88	0.000
Subjective norm	<i>Wary</i>	<i>Finance wary</i>	-0.86	0.001
		<i>Very committed</i>	-0.76	0.013
Self Identity	<i>Wary</i>	<i>Finance wary</i>	-1.09	0.000
		<i>Very committed</i>	-1.23	0.000
Control personal	<i>Wary</i>	<i>Finance wary</i>	-0.68	0.008
Control personal		<i>Very committed</i>	-0.90	0.001
Control external	<i>Very committed</i>	<i>Finance wary</i>	0.82	0.012
Control external		<i>Wary</i>	1.44	0.000
Moral Obligation	<i>Wary</i>	<i>Finance wary</i>	-0.83	0.000
		<i>Very committed</i>	-1.01	0.000

Compared to the other two segments the *finance wary* segment were more likely to have farmed prior to commencing organic farming, have converted since 2000, have a medium sized farm (50-100 acres), be involved in beef farming and be middle aged (40-55). 62% indicated that subsidy support was one of the top three reasons for becoming involved, this compares to a sample population percent of 51. Similarly, 36% indicated that subsidy support was one of the top three reasons for remaining involved in organic farming, this compares to a sample population percent of 28. Interestingly, the perceptions of the finance wary were very similar to those of the totally committed from

the perspective of attitudes, subjective norms, perceived self-identity, perceived moral obligation but this segment had a similar view to the wary when considering *external* control.

Table 9. Reasons for becoming an organic farmer-segment analysis

Reasons for becoming an organic farmer (Total sample %)		<i>Finance wary</i> (%)	<i>Wary</i> (%)	<i>Very committed</i> (%)	Chi-square	P-value
Environmental benefits	(64)	65	50	78	10.02	0.007
Health Concerns	(41)	42	25	54	10.36	0.006
Improved food quality	(40)	38	27	56	10.54	0.005
Work with the bio-system	(7)	4	2	16	12.34	0.002
Improved animal welfare	(32)	34	23	37	2.87	0.238
Subsidy supports	(51)	62	71	11	55.07	0.000
Extra Margins	(16)	18	21	6	6.13	0.014
Is the future of farming	(28)	24	30	35	2.62	0.270
Growing Market	(14)	18	16	3	8.37	0.015
Consumer demand	(17)	20	18	11	2.34	0.310
Societal and public good	(11)	6	14	16	4.95	0.084

Compared to the other two segments the *wary* segment are more likely to be farming part-time, have converted to organic farming between 1994 and 1999, be involved in sheep or dairy with other production and be younger (≤ 40). Furthermore, farmers in this segment were more likely to convert to organic farming due to potential financial benefits. Seventy one percent indicated that subsidies was one of the top three reasons for becoming an organic farmer, this compares to 51% of the total sample while 21% indicated that extra margins was an important reason, this compares to the sample average of 16%. Compared to the other two segments, this segment was much less likely to cite environmental benefits, health concerns or improved food quality as one of their top three reasons for becoming an organic farmer. With regard to remaining in organic farming this segment was significantly more likely to mention subsidies (34%) and extra margins (30%) than the total commitment segment and while 50% mentioned environmental benefits this was significantly lower than for the *finance wary* (60%) and *total commitment* (83%) segments. When compared to the other two segments the *wary* segment had a more negative attitude, did not have as strong a self-identity, did not feel as strong a moral obligation, did not feel the same social pressure and had lower level of perceived *personal* control. Furthermore, compared to the *total commitment* segment this segment perceived lower levels of *external* control.

Finally, compared to the other two segments the *total commitment* segment is more likely to not have farmed prior to commencing organic farming, farm on a full-time basis, have commenced organic farming before 1994, have a

farm that is less than 50 acres and be involved in mixed farming or horticulture. Members of the committed segment were much more likely to be originally from a country other than Ireland (53%). The commitment of this segment was further illustrated when one examined the reasons for becoming an organic farmer. Financial motives were mentioned by a small percentage of this segment, in fact only 11% cited subsidies as a reason for becoming an organic farmer. This compares to 62% and 71% for the *finance wary* and *wary* segments respectively. Environmental benefits, health concerns and food quality concerns were more likely reasons for becoming an organic farmer for this segment than for the other segments, these were also the more likely reasons for remaining in organic farming. Their perspective on organic farming reflected their commitment and, as discussed above, they were generally more positive than the *wary*, and they were also more positive than the *finance wary* segment when considering external control

Table 10. Reasons for remaining as an organic farmer-segment analysis

Reasons for remaining as an organic farmer (Total sample %)	<i>Finance wary</i> (%)	<i>Wary</i> (%)	<i>Very committed</i> (%)	Chi-square	P-value
Environmental benefits (64)	60	54	83	12.95	0.002
Health Concerns (47)	50	29	56	10.07	0.007
Improved food quality (46)	46	32	59	8.449	0.015
Work with the bio-system (6)	5	9	8	1.34	0.512
Improved animal welfare (27)	27	29	25	0.154	0.926
Subsidy supports (28)	36	34	8	17.41	0.000
Extra Margins (21)	26	30	3	16.67	0.000
Is the future of farming (25)	26	20	30	1.74	0.420
Growing Market (15)	18	18	6	5.138	0.077
Consumer demand (21)	23	25	13	3.533	0.171
Societal and public good (17)	14	18	22	1.82	0.403

Conclusions and Discussion

In this research the framework provided by the theory of planned behaviour proved useful, however it is clear from the analysis that factors outside this framework also contributed significantly to commitment to organic farming. In fact commitment to organic farming was not only associated with attitude, subjective norm and control, but also with moral obligation and self identity.

The response rate to this postal survey was good at 27%. This translates to 27% of the total population of organic producers completing the survey. Clearly some biases may result from the postal process, in that respondents had to be motivated enough to complete a rather lengthy survey. However, the relative proportions of each farming type are similar to that of the DAF (2002)

report, providing some evidence for supporting the general conclusions drawn.

It is clear from the profile of respondents that organic farming has grown considerably during the 1990's and this in some part has to be attributed to the introduction of subsidies. It is interesting to see the negative contribution to attitude toward organic production made by the belief-evaluations about survival of organic farming (without subsidies). Those that are concerned about survival without subsidies have a more negative attitude towards organic production. However, this view is not surprising as just over half of the respondents indicated that subsidies was one of the top three reasons for becoming involved in organic production. It is interesting to note that the percent citing subsidies as a reason for remaining in organic production is considerably lower (28%, down by 13%). This suggests that the subsidies are a positive incentive for conversion but that factors such as growing consumer demand (up by 5%, from 17% to 21%), health concerns (up by 6%), improved food quality (up 6%) and extra margin (up 5%) become more important after converting to organic farming.

It is also clear that it is not only attitudes towards organic farming that influences continued commitment to organic production, but also perceived moral obligation to the environment, seeing organic production as a reflection of oneself (self identity) and the views of important others (subjective norms). Finally a feeling of control over the activities linked to organic production also impacted on commitment to organic production. Continued support by government is important to the confidence of some organic producers; however support in the further development of markets for organic produce may increase the perception of financial security and thus commitment. The strong feeling of moral obligation to maintain the environment amongst producers suggests that those who have converted post-REPS also have an affiliation to the organic ethos, however the degree to which this is felt impacts on commitment. While the mean score for self identity suggests that organic farmers saw themselves as slightly reforming, innovative and progressive, the degree to which they saw themselves in this manner was a significant determinant of commitment. It is likely that farmers who will convert in the future are those who are positive and proactive about their role in the agricultural sector.

Segmenting the sample based on commitment to organic production provides an interesting insight into the organic farming population. The very committed segment is more characteristic of the common description of organic farmers than the wary segment. Farmers in the very committed segment typically have smaller farms, are longer in operation and are committed to organic agriculture due to perceived environmental and health benefits and improved food quality and animal welfare. This segment also has a substantial percentage of non-Irish farmers. This is not surprising as traditionally the Irish organic sector was very much influenced by immigrants (mainly from other European countries) coming to Ireland to establish organic farms. These non-Irish farmers were committed to the organic ethos and way of life and viewed Ireland as a non-industrial, agricultural environment very suitable to the establishment of organic farming (Willer and Gillmor, 1992). It is interesting to find that the profile of the Irish organic farmer has changed

over time; this supports findings in other countries where farmers who have recently converted to organic farming display greater interest in marketing and financial viability than those who converted some time ago (Michelsen, 2001; Padel, 2001). Farmers in the wary segment tend to be part-time and younger; it would appear that financial gain was the main incentive for this group to convert to organic farming. In the main farmers in the finance wary and very committed segments have similar reasons for remaining in organic farming, with the exception of the former placing a greater importance on subsidies and margins and the latter more importance environmental benefits.

The comparison of the segments based on attitudes and perceptions highlighted similarities among the finance wary and the committed segments for all constructs with the exception of external control, with farmers in the very committed segment more positive about external control. Thus it is only the wary segment that represents a group of organic farmers, who are less committed to what could be considered an organic farming ethos. Therefore, it appears that a full-time committed cohort of organic farmers is emerging, while it is likely that a reduction in subsidies would prompt some farmers classified as less committed to exit, many would stay as they view market development as increasingly important to their viability. It is interesting to find that subsidies were an important incentive to prompt farmers to convert to organic farming and thus continued subsidies are important if the number of farmers involved in the sector is to increase. Given such subsidies it is likely that the number farmers will increase, but investment in market and product development is also very important, not only to attract farmers to organic farming but to keep them in this sector. Thus the role of supply chain actors (including state support agencies) in market development will become increasingly important to the development of the Irish organic sector.

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