Values, attitudes and intention to consume wild fish versus farmed fish in Nha Trang

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Abstract

The primary purpose of this study was to investigate the consumers' value and the difference in consumption, attitude and intention to consume wild fish versus farmed fish in Vietnam. Second, it aimed to investigate the relationship between values, attitudes and intention to consume wild versus farmed fish by applying value-attitude-behavior model. The measurement scales used here were adapted from previous studies found in the literature. The survey was conducted in Nha Trang, Vietnam, among convenience sample of 206 respondents. This study found that personal values are very important to the consumers. Environmental issues related to food/fish consumption found to be quite important while animal welfare issues were not important to them. They had significantly high attitude and intention as well as consumption of wild fish than that of farmed fish. The beliefs of quality and availability of wild fish was significantly more positive when compared with farmed fish. Structural equation modeling identified that environmental concern of the consumer and benevolence values were significantly related to positive attitudes towards wild fish consumption while universalism values had non significant, high positive impact, suggesting that more people are concerned about these issues, the more positive attitudes they have towards wild fish. However, their concern about fish welfare issues found to be negatively related with attitudes towards wild fish consumption. All these values were non significant in determining attitudes towards farmed fish consumption. The explained variance of the attitudes towards wild and farmed products from the values, however, found to be less. The study found that beliefs of quality and availability were significant predictors of attitudes towards both products than the welfare and sustainability issues. The findings indicated that from a marketing point-of-view, wild fish products can be appeal to environmental and welfare concern, personal values as well as attributes beliefs level of the consumer, while demand for the farmed fish products can be enhanced mostly by appealing to the attitudinal beliefs based on the attributes. The study provides useful information for fish farming and marketing companies as well as environmental policy makers. From a theoretical point of view, this study partially confirms the Value – Attitude – Behaviour relationship model (VAB).

Keywords: Values, attitudes, intention, fish farming, fish consumption, Vietnam

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1. Introduction

The greatest worldwide expansion of the aquaculture has occurred during the last three decades, driven by the risk of world's diminishing natural fisheries coupled with increased demand for fisheries products (Conte, 1996). Now it has recognized as a major food production industry in the world (Verbeke, et al, 2007a). Asia, the Indian subcontinent and Southeast Asia dominate aquaculture production and the Vietnam is the third largest aquaculture producing country with 1.7 million tonnes of production and 17.6 % growth rate in 2006 (FAO, 2008).

Consumers prefer fish and seafood for different reasons (Olsen, 2004). Preferences and attitudes seems to be of vital importance (Olsen, 1999, 2003) and the consumers with positive attitudes to eating fish, are expected more likely to consume fish (Olsen, 2003; Shepherd and Raats, 1996). Preferences or attitudes toward farmed versus wild fish can be explained of several reasons like perceived quality (Farmer et al., 2000; Verbeke et al., 2007a), sensory properties (Luten et al., 2002; Cahu et al., 2004) nutritional values (Haard, 1992; Cahu et al., 2004), health and safety (Verbeke et al., 2007a; Cahu et al. 2004), price (Luten et al., 2002), environmental and ethical concern of the consumer (Honkanen and Olsen, 2009; Verbeke et al., 2007b) and personal values.

Similar to the terrestrial animal farming, aquaculture also subjected to assess the impact on the environment and animal welfare issues (Honkanen and Olsen, 2009; Verbeke et al., 2007b). Since different interest groups hold differing values, debate regarding wild fish versus farmed fish consumption has been arise recently. There are evidences that higher per cent of the world population now claims to be environmentalist and younger, more educated, urban people are now tend to think about the environmental problems (Vaske and Donnelly, 1999). This trend has resulted with emergence of the ethical consumer, who feels responsibility toward society and perceives a direct link between consumption decision making and the social issues itself (Verbeke et al., 2007b). This consumer expresses their feelings by means of his or her purchase behavior (Pelsmacker

et al., 2005). Because these trends are likely to continue into the future, it is important for fish farming companies, marketers and environmental policy makers to understand how values influence attitudes and support or opposition for consumption of wild versus farmed fish. In the literature environmental concern and animal welfare concern has identified as ecological food choice motives (Honkanen et al, 2006; Lindeman and Vaananen, 2000) which guide the relevant consumer behavior. In addition to that personal values such as universalism (Dreezens et al, 2005, Honkanen and Verplanken, 2004) and benevolence (Lea and Worsley, 2005) have been used in literature to explain the ethical behavior of the consumer.

Among a wider range of theoretical models in explaining the consumer behavior, Value-Attitude-Behavior model is one of the popular models (Homer and Kahle, 1988). In the literature the model has widely used to investigate the role of personal values and value orientation in consumer behavior related to various issues. For instance, the influence of personal values on e-shopping behavior (Jayawardhena, 2004), mall shopping behavior (Shim and Eastlick, 1998) and value orientation in response to natural resource issues (Vaske and Donnelly, 1999) can be given. In addition to that, in food related studies such as choice of genetically modified food (Honkanen and Verplanken, 2004), behavioral intention towards the functional foods (Tudoran et al., 2009), natural food shopping (Homer and Kahle, 1988) and intention to consume organically grown food (Honkanen et al, 2006) has been predicted by using this model. In this study, VAB model applied to understand the relationship between underlying values, attitude and intention to consume wild versus farmed fish among the Vietnamese consumers.

1.1 Research questions and objectives

The difference in consumers' values and attitudes may open path for fish-farming companies, marketers to find their target group among the consumers, and positioning the products based on environmental and animal welfare issues (Honkanen and Olsen, 2009). Therefore the first objective of this study is to investigate consumers' value and the difference in consumption, attitude and intention to consume wild fish versus farmed fish

in Vietnam. The constructs are measured with the scales constructed by previous studies. The purpose of this study is to explore the relationship between values, attitudes and intention to consume wild fish versus farmed fish in Vietnam.

Although the relationship between food attitudes and food choice (Dreezens et al., 2005) and relations between ethical values, attitudes and food choice related to some food categories as organic food (Honkanen et al, 2006) has been studied before, according to the researcher's knowledge there is no attention has been given to the relationship between personal values, ethical and environmental values, attitudes and intention related to farmed fish versus wild fish in the developing world.

The precise research objectives of this thesis are as follows:

i. To investigate consumers values and the difference in consumption, attitude and intention to consume wild fish versus farmed fish in Vietnam

ii. To explore the relationship between values, attitudes and intention to consume wild fish versus farmed fish in Vietnam

Consumer concerns about both wild fish harvesting and the fish farming can embrace environmental and fish welfare issues (Honkanen and Olsen, 2009). In case of wild fish harvesting, the problems such as overexploitation of fish stocks (Hentrich and Salomon, 2006), damage to the habitat and seabed seem to be important to the environmentally conscious consumers. In fish farming, issues like pollution from untreated effluents pass in to surrounding waters and serious threats to wild fish populations by escapees also seem to be concern by consumers (Read and Fernandez, 2003; Kaiser, 1997; Cotter et al., 2000). The usage of large quantity of small wild fish that could be used as human food in farming predatory fish is also a potential problem from a moral point of view (Tinarwo, 2006) and also this deprive the food for larger fish and other sea lives. Some people may consider fish farming as positive because it satisfy their preferences with different qualities (Morris et al., 2005) and well control production (Verbeke et al., 2007b) with protecting the wild fish stocks from over-exploitation. There are also animal welfare issues related to both wild fish harvesting and the fish farming. The consumer concerns

about these welfare issues may be related to keep fish in captivity, pain, fear and stressful feeling to the fish at harvesting (Cooke and Sneddon, 2007; Tinarwo, 2006).

By considering such issues some consumers may hold positive attitude towards farmed/wild fish because they consider the ethical and environmental advantages of farmed/wild fish consumption. Others may evaluate farmed/wild fish negatively by considering the ethical and environmental disadvantages of particular fish type. In addition to that ambivalent attitude towards farmed/wild fish may be arised by considering both ethical and environmental advantages and the disadvantages simultaneously. Therefore, these two attitudes provide a broader perspective of the influences that values can have on attitudes than one attitude issue would have. Therefore by comparing the attitude towards the wild fish and farmed fish, the marketer can understand the psychological tendency that consumer expressed by evaluating those two products using their values.

1.2 Method

To investigate consumers' value and the difference in consumption, attitude and intention to consume wild versus farmed fish and to test the relationships among the constructs in conceptualized VAB model, the survey was conducted in the Nha Trang, Vietnam. The sample size was 206. The questionnaire was designed to assess the consumers personal values, domain specific values (environmental concern and welfare concern related to food and fish), attitudes towards the food ethics and production, attitudes towards the wild/farmed fish consumption, important attribute beliefs (that explain the attitudes), intention to consume wild/farmed fish and the actual fish consumption frequency. Items to measure the constructs were used or adopted from the previous studies found in the literature. In analyzing the data, first exploratory factor analysis, reliability test, and descriptive analysis were performed. Then the hypothesized relationships were tested by structural equation modeling (SEM). The SPSS 17.0 and Amos 18.0 were used to analyze the data.

1.3 Structure of the thesis

After this introduction chapter, in the Chapter 2 the theoretical and conceptual framework of the research has discussed. Chapter 2, briefly introduces the Value-Attitude-Behavior (VAB) model, and then discusses the aspects of the constructs within the framework. Data collection and method is discussed in the Chapter 3 focusing on the measures, techniques for testing reliability and mean difference, factor analysis, and structural equation modeling. Chapter 4 presents the results of data analysis and model establishments. Finally, Chapter 5 discusses issues related to the results, practical implications and suggestions for future researches.

2.0 Conceptual framework

Food choice behavior is considered as a complex phenomenon since it involves a complex interaction between the sensory properties of the food, factors specific to the individual, environmental, cultural and contextual influences (Honkanen and Frewer, 2009; Steptoe et al., 1995). With this all, the interest in sustainable food production and consumption has increased at all levels of the food chain including the consumer level. Further, consumers attach high perceived importance to welfare and sustainability related to fish they consume (Verbeke, 2007b). Therefore it is important to consider the impact of sustainability and ethical concerns of the consumer decision-making toward wild versus farmed fish consumption.

This research assumption builds on the value-attitude-behavior hierarchy (VAB) model, which is proved to be a useful framework for investigating consumer behavior towards different attitude objects, including food objects (Honkanen et al., 2006; Homer and Kahle, 1988; Vaske and Donnelly, 1999). As discussed in the first chapter, this model applied as conceptual framework to discuss the relationship between values, attitudes and intension to consume wild versus farmed fish consumption in Vietnam. In this section brief introduction of value, attitude, and intention/behavior hierarchy model is presented at the beginning and there after conceptual discussion has presented to clarify various concepts to build a conceptual model for this study.

2.1 Value attitude intention/behavior hierarchy model

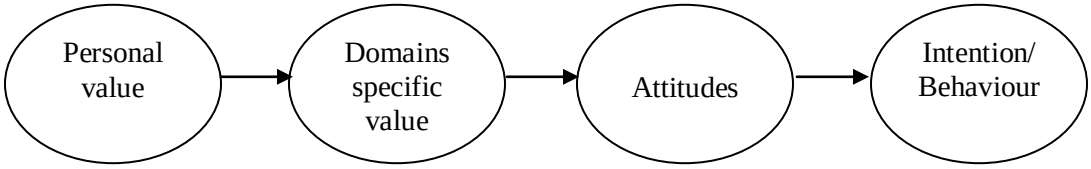
According to Homer and Kahle (1988) values are similar to attitudes and both are emerge continuously from the assimilation, accommodation, organization, and integration of environmental information in order to promote interchanges with the environment favorable to the preservation of optimal functioning. Values are the most abstract of the social cognitions and from these abstractions attitudes and behaviors are manufactured. Therefore values guide individual's behavior by flowing influence from abstract values to

midrange attitudes to specific behaviors. This sequence can be called as the value-attitude-behavior hierarchy. Similarly Vaske and Donnelly (1999) described this as the individual's view of the environment in which s/he lives can be organized in to a cognitive hierarchy consisting of values, value orientations, attitudes, behavioral intentions, and behaviors and each of these elements builds upon one another. In the literature VAB approach has proved to be a useful framework for investigating such wider range of consumer behavior as choice of leisure activities (Beatty et al., 1985), automobile purchase (Henry, 1976), mass media usage (Becker and Connor, 1981), products choice criteria (Pitts and Woodside, 1983), wild land preservation (Vaske and Donnelly, 1999), mall shopping behavior (Shim and Eastlick, 1998), e-shopping behavior (Jayawardhena, 2004), effect of green labels (Bjork, 1998) and so forth.

In addition to that it can be find enough evidence that use of VAB model to investigate consumer behavior towards different food/fish related attitudes studies; behavioral intention towards the functional foods (Tudoran et al., 2009), buying of organic foods (Grunert and Juhl, 1995) and the context of natural food shopping (Homer and Kahle, 1988). By applying this model researchers have found a significant relationship between values, attitudes, and behavior. For example, Homer and Kahle (1988) used LOV to study the causal relationship between values, attitudes, and behavior in the context of natural food shopping. They found support for the hypotheses that values influence attitudes towards nutrition and that attitude mediates the relationship between value and food shopping behavior. Honkanen et al. (2006) examined the value-attitude-behavior cognitive hierarchy in the context of organic food choice. They emphasized that the value orientation (domain specific values) predict the respondents attitude towards the organic food consumption. Further the attitude mediated the relationship between ethical values and intention to consume organic foods. According to the literature, Honkanen and Verplanken (2004) states that some studies shows attitudes only partially mediate the relationship between values and behavior or intentions. It is possible if subjects do not have well formed attitudes towards the attitude object.

In many food related studies, attitudes are found to be the most important predictor of intention to buy that food (Povey et al., 2001). According to the study done by Honkanen et al. (2006) with respect to ethical values and motives driving organic food choice, they found that the relation between attitude and intention was positive and quite strong. This indicates that consumers with positive attitudes towards consumption of organic food are more likely to form intentions to consume such food. Similar results were observed by Sparks and Shepherd (1992). But many studies have found only a weak relationship between values and behavior (e.g. Homer and Kahle, 1988).

In this study VAB hierarchy model is use to test the relationship among consumers' personal values, domain specific values, attitudes and intention to consume wild fish versus farmed fish in Vietnam. The general and simplified model (figure: 2.1) can be presented as follows.



(Source: Vaske and Donnelly, 1999)

Figure 2.1: Simplified Value-Attitude-Behavior hierarchy model (VAB)

In the following, I will discuss the main constructs and their relationships in order to clarify the conceptual model used in this study.

2.2 Food intention and consumption

Intention is most often defined as indications of how much effort people are planning to exert in order to perform the behavior (Ajzen, 1991). Olsen et al. (2008) state that when increase the person's intention, it influence him/her to make harder try and greater possibility to occur that behavior. According to Ajzen (1991), most immediate determinant of any behavior is the intention to perform that behavior. Further, the Theory of Reasoned Action used to explain volitional behavior that is under the control

of the individual. With volitional behaviors it is argued that intention to perform behavior is the most directs and the best predictor of that behavior. It is assumed that most socially relevant human behaviors are under the volitional control of the individual (Donnelly et al, 1999; Shepherd and Raats, 1996; Tudoran et al., 2009). Therefore analysis of the determinants of the intention to perform a behavior is identical to an analysis of the determinants of that behavior itself (Fishbein and Manfredo, 1992).

According to Ajzen (1991) intentions to perform behaviors can be predicted with high accuracy from attitudes toward the behavior, subjective norms, and perceived behavioral control. Intention is a psychological construct that distinct from attitude and it represents one's motivation to carry out a behavior (Eagly and Chaiken, 1993). Bagozzi and Yi (1988) interpreted as formation of intention is initiated with attitudes; which may be new attitude forms or an existing attitude is recall from memory. This shows that desire to perform the particular action will be a function of the strength of one's attitude. Further one has given much consideration to the act, means that intentions will be well formed and thus more likely to reflect attitudes. As a result, well formed intentions should mediate the effects of attitudes on behavior while ill formed intentions do not.

Several studies have suggested that there is a high positive relationship between intention and behavior (Armitage and Conner, 2001; Ouellette and Wood, 1998). For example, the correlation between intention to buy organic fruit and vegetables and the relevant behavior was 0.70 (Saba and Messina, 2003). Tuu et al. (2008) reported that the intention was highly associated with the frequency of consumption of the common food in Vietnam. Choo et al. (2004) also confirmed that intentions to buy new food product is a good predictor of actual purchase behaviour among innovative Indian consumers. Further, in accordance with the above findings Sapp and Harrod (1989) has found that there is significant impact on the intention to eat beef and the actual eating of beef from a study on social acceptability and intentions to eat beef (see McCarthy et al., 2003 for a review).

Intention to buy or consume is often used in the literature as a behavioral indicator when testing the hypothetical products, and also to estimate the potential demand for new products (Lilien and Kotler, 1983). It will omit the problem of restricted availability of a new product in assessing the buying behavior, and estimate whether it is worthwhile to launch such products. Further, when behaviors pose no serious problems of control, they can be predicted from intentions with considerable accuracy (Saba and Vassallo, 2002). On the other hand Vaske and Donnally (1999) states that even the behavioral intention and actual behavior are directly related there is not a perfect correlation between these two constructs. For example, Bogers et al. (2004) observed that the vegetable consumption can only be weakly predicted by intentions. They have given several explanations for this weak relationship between intention and behaviour such as habitual nature of dietary behaviours and misconceptions used in assessing food consumption. Further, in a meta-study, Sheeran (2002) has found that the overall correlation between intentions and behavior is 0.53 (Honkanen et al, 2006). Sheppard et al. (1988) has also found that the same average correlation between the intention and behavior by meta analyzing 87 estimated relationships in the literature.

These findings indicated that even the intention is not perfectly predict the behavior there is a high positive correlation between intention and behavior. Therefore in this study, in order to be consistent with previous researches in the literature, intention to consume used as a surrogate measure of the actual purchasing behavior. An important reason to emphasize intention instead of actual behavior is that I am not confident that many consumers are consistent in their judgment of actual consumption of farmed versus wild fish. However, a measure of consumption will also be performed – and validated as a construct.

2.3 Attitude and the attitude object

Attitudes has identified as one of the main determinants of explaining food consumption behavior (Shepherd and Raats, 1996) and strongest predictor of behavioral intention (Olsen, 2004; Honkanen and Verplankan, 2004). Most often it defined as a psychological

tendency that is expressed by evaluating a particular object (e.g. food product) with some degree of favour or disfavor (Eagly and Chaiken, 1993). It has widely accepted that the term attitude used to explain a very complicated entity since it composed of a heterogeneous series of thoughts and other responses relevant to expressing the meaning and feeling of different perception towards objects such as products, persons or ideas (Olsen, 1999). Fazio (1995) views attitudes as object evaluation associations and Olsen (1999) explained attitude objects as people's evaluation of sensory qualities (colour, taste), concrete objects (products, animals), abstract concepts (values), system of thoughts (ideologies) or actions (eating, buying, selling).This suggests that people hold attitudes to determine how to respond to their environment (Shavitt, 1989). Even though there are different definitions for attitudes that focus on different aspects, all these agree that attitude is an evaluative state that intervenes between certain classes of stimuli (objects or entity) and certain classes of evaluative responses (Olsen, 1999). There are thousands of attitudes and are considered as the final belief level in the cognitive belief hierarchy consisting global values, domain specific values and attitudes (Vinson et al., 1977). Attitudes are more specific than values and influenced by values (Honkanen and Verplanken, 2004), hence more directed towards specific object, situation, or behavior than the values (Honkanen et al., 2006).

According to recent conceptualizations in social psychology identified that attitudes has several dimensions. Mainly it consist with evaluative dimension and one or more non evaluative dimensions. Evaluative dimension of attitude mostly consists of valence and extremity. The valence express the positive or negative direction of the attitude (Thurstone, 1946) while extremity component deals with the evaluation of a given valence. For instance extremity distinguished very positive evaluations from moderate or slightly positive evaluations (Zanna and Rempel, 1988). The non-evaluative dimensions may be important moderators of attitude-behavior consistency (see Olsen, 1999 for a review).

Attitude objects within food related studies are often attributes (odour, texture), natural products (cod, lamb), brands (Nabisco Foods, Quaker Oatmeal), general product

categories (seafood, meat) (Olsen, 1999). Since attitudes are complicated, in order to measure effectively, attitude objects have to clearly specify and it is essential to identifying relevant properties are to be measured (Fabrigar et al., 2005). Some studies have found that attitude towards purchasing some products strongly influenced by the attitudes towards the production methods (Bredahl, 2001). Some time consumers may hold more general attitudes towards the nature and/or the technology with in particular social context. These attitudes influenced to the attitudes towards food production methods which in turn influenced to the resulted product (Bredahl, 2001). On the other hand consumers evaluate some specific food (e.g. fiber enriched fish products) from general attitude towards certain food category (functional food) (Tudoran et al., 2009).

Rozin (1990) has suggested that the formation of positive and negative attitudes toward food involves different psychological mechanisms and further it has mentioned that the negative attitudes toward food may result from negative sensory experience, from fear of harm to the body, and from negative symbolism associated to the thought of food or its origin (Letarte, et al., 1997). Some researches have found that the food product evaluation (e.g. potatoes) has influenced by attitude towards the product's region of origin through the product-specific regional image (human factor, natural environment, and climate) and product attribute perception (Ittersum et al., 2003). There is a contextual difference in food product evaluation by consumers. The contexts can be vary as the time of the day, specific meals, user's gender or mood, or a specific situation (e.g. Picnic, at party, lunch) (Nantachai et al., 1992; Lahteenmaki and Tuorila, 1998).

Finally, summarizing these all, it can be said that there are several facets of attitudes in a food context which influence the food consumption behavior. On the general level, attitude towards food ethics and production can be considered as a bridge between domain specific value and the more specific attitudes toward wild versus farmed fish. Therefore measure of attitude towards food ethics and production will also be performed for descriptive purpose, but not included in the proposed theoretical model. Since the last constructs (attitudes toward wild versus farmed fish) is considered to be the most important in explaining intention to buy and consume wild versus farmed fish, I will start

with a discussion of the construct, first as general food attitude, then as attitudes toward seafood and different products of seafood.

2.3.1 Dimensions of food attitude

Attitudes are suggested to be one of the main determinants of explaining food consumption behavior (Shepherd and Raats, 1996). Researchers have emphasis that if there is high affective and cognitive consistency of attitudes, then either component would lead to a similar general evaluation and that will result all subsequent behaviors in a similar manner (e.g. Millar and Tesser, 1989). Therefore usefulness of examining the dimensions of attitudes (information underlying attitudes or attitudinal bases) was understood (Aikman et al., 2006). Similarly, Olsen (2004) stated that in order to investigate antecedents of food attitudes, it is important to evaluate different beliefs associated with the food product. But later research have been suggested that some other additional information such as sensory appeal, natural content, price, weight control are also important to determine food attitudes. Therefore Aikman et al. (2006) investigated five dimensions that are important for determining food attitudes across a range of people in US. These dimensions includes positive affect (e.g., calm, comforted), negative affect (e.g., guilty, ashamed), abstract cognitive qualities (e.g., healthy, natural), general sensory qualities (e.g., taste, smell), and specific sensory qualities (e.g., salty, greasy). Taste, distaste (negative affect) and nutritional value has suggested as the most salient food attributes forming attitude toward food (see Olsen, 2004 for a review).

Attitudinal factors have been found to have significant effects on seafood consumption in a number of past studies. Attitude towards the flavor and texture of the products has identified as the main factor that responsible for consumers' acceptance or rejection of fish (Leek et al., 2000). Moreover, several studies suggested that quality and freshness in a more general sense as important for the evaluation of seafood and identified that the quality is mostly determined by the degree of freshness. Therefore consumers' evaluation of fresh seafood is important because it facilitate easy access to cues like appearance, texture and smell (see Olsen, 2004 for a review). Seafood appear to be less preferred

among Norwegian teenagers as a meal compared with chicken, meat products and modern dishes like pizza, taco and pasta products. It has identified that taste is the most important criteria in forming food /seafood attitude especially among young consumers (Olsen, 2004). Further, in explaining general attitudes and motivation for consuming seafood, it has been proved that taste is most important factor (Olsen, 2001). Verbeke and Vackier (2005) also reported that the taste can be considered as the most important driver in explaining fish consumption frequency.

To identify the seafood products that are most salient to consumers, Kinnucan et al. (1993) used "evoked set" methodology and consumers were asked about the seafood products they would consider when making a purchase decision. Even there are few exceptions, the key findings relating to attitudinal factors and the consumer thinks of fish as nutritious, convenient, costly, flavorful, healthy has little impact on preferences as measured by the evoked set. Taste and the healthy image of fish are considered as important characteristics (Verbeke and Vackier, 2005). When consider about elder consumers they rate nutrition and health as important aspects of food selection (Roininen et al., 1999). But Leek et al. (2000) state that despite there is trend towards healthier eating, the consumption of food which consider as healthy has decreased. On the other hand, even red meat may have unhealthy properties (Foxall and Haskins, 1986) it is more popular than fish. Further, according to Verbeke et al. (2007a) majority of the Belgium consumers reported no perceived differences between farmed versus wild fish. In their study consumers had considerable trust in aquaculture activities specially when considering safety issues; since the toxic contaminants can be easily controlled in farmed fish than in wild ones. On the other hand substances such as growth hormones believed to be present more in farmed fish. Therefore with respect to the healthiness of farmed fish, consumers face a perceived trade-off between growth hormones versus heavy metals. However, mean perception scores were slightly in favour of wild fish on the attributes and they perceived that wild fish is healthier and more nutritious than farmed fish.

A more extensive set of six attitudinal categories toward fish was identified by using nine perception variables from a study of seafood purchases by consumers in the northeastern

United States (Herrman et al, 1994). They were measured respondents' perceptions of such attributes as the flavor, fish odor, attractive appearance and packaging, and nutritional value of fish. These categories were labeled very favorable, favorable but expensive, nutrition and convenience focused, availability-nutrition-quality focused, indifferent, and do not like fish.

According to some studies it has been found that people may be hesitate to consuming fish due to some perceived difficulties in buying, preparing and cooking fish and further they have belief that it is expensive, or associate with unpleasant physical properties such as bones and the smell (see Leek et al., 2000 for a review). Similarly Verbeke and Vackier (2005) identified that the bones in fish and the price as main attitudinal barriers to frequent fish consumption. But some other studies have found that the price is not a barrier in seafood consumption (see Olsen, 2004 for a review). However attributes such as unpleasant smell and bones contributes only negatively in forming food attitude of the consumers (Olsen, 2004). Further, with respect to availability, consumers' opinions favour towards farmed fish, indicates of some awareness among consumers about the availability issues of farmed versus wild salmon (Verbeke et al., 2007a).

Kole et al., (2009) was found that information about product type, price, freshness and the advantages of fish farming could influence product evaluation by the consumers. When they do not know about the origin of the product, the farmed cod was better appreciated, but being perceived to be less tender more firm and less fatty. Further, when product labelled as wild, highly priced or recently caught was judged more favorably than the unlabelled product. However in a realistic situation they demonstrated that farmed fish was associated with less favourable product characteristics.

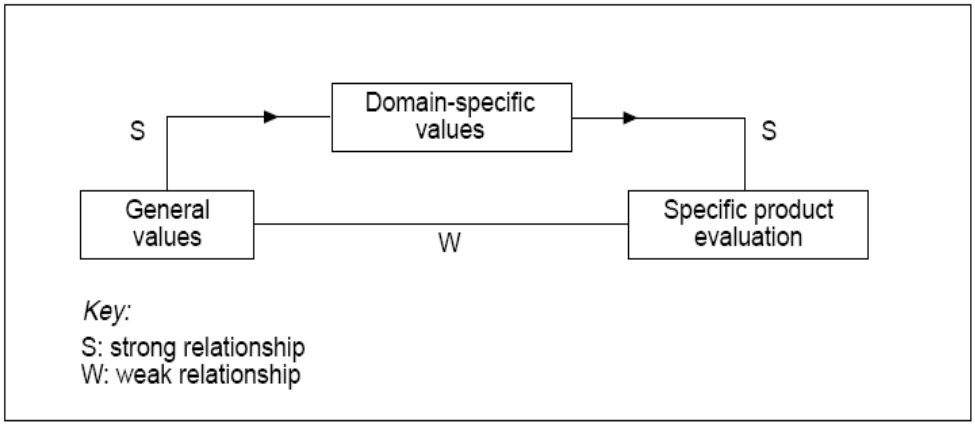
Luten et al. (2002) studied the evaluation of wild cod versus wild caught, farmed raised cod from Norway by Dutch consumers. They evaluate the qualities related to (sensory) attributes such as satisfying, liking, quality, freshness, taste, juiciness, firmness, naturalness, healthy, price, smell and colour of wild and farmed cod in the four consumer groups. The consumers seemed to appreciate farmed cod as good as wild cod and

occasionally slightly better on scales such as freshness, taste, juiciness and firmness. However, these results were not followed the results from expert evaluations in their study.

Based on the previous discussion, this study want to evaluate the following attributes toward farmed versus wild fish; taste, odor, appearance, texture, freshness, healthiness, naturalness, nutritious, price, availability, sustainability and ethics.

2.4 Domain specific value

The influence of global values on attitudes and behavior occurs indirectly via basic beliefs or domain specific values (Vaske and Donnelly, 1999). Domain specific values serve to strengthen and give meaning to fundamental or global values (figure: 2.2) since the personal values are widely shared by all members of the culture and fail to provide much of the variability in specific attitudes and behaviors. Honkanen et al. (2006) has states that, domain specific values are belief relevant to the activities such as economic, social, religious and they defined ethical food choice motives as a value construct at this level. Domain specific values has defined in the literature using terms such as value orientations (Vaske and Donnelly, 1999) or food related lifestyles (Brunso et al., 2004). Further, these values are more specific and more numerous than personal values, but more abstract than attitudes.



(Source: Raaij and Verhallen, 1993)

Figure 2.2: Intervening role of domain specific values

Values and attitudes with regard to the behavioral domain will provide a better explanation than general personal values for specific behavior. Raaij and Verhallen (1993) explained this by measuring the personal values as well as same values held with regard to behavioral domain such as breakfast. The attitudes towards breakfast products (margarine) were also assessed by them. The general personal value of ambition correlated highly with fast breakfast (domain specific values) which correlated with the spreadability of margarine. But there was not observed a direct relation between the personal value and specific product evaluation.

In this study I define both environmental and ethical concern associated with food in general and environmental and ethical issues associated with seafood (wild versus farmed) in particular under the domain specific value construct.

2.4.1 Environmental and ethical concern associated with food

The way consumers evaluate their food when making choices may be highly diverse and complex (Steptoe et al, 1995). Even the sensory aspects have been proven to be the most salient purchase criterion (Torjusen et al., 2001; Wandel and Bugge, 1997), consumer concern about extrinsic factors such as animal welfare and environmental impact associated with food production may also influence their food choices (Frewer et al., 2005; Pan-Huy and Fawaz, 2003). Doane (2001) has defined ethical consumption as the purchase of a product that concerns a certain ethical issues such as human rights, labor conditions, animal well-being, environment, etc. (see Pelsmacker et al., 2005 for a review). On the other hand Honkanen et al. (2006) state that ethical concern of the consumer in food choice can be defined as domain specific value. Therefore the consumer concern about ethical and environmental aspects related to food they consume when consumption decision making can also be consider as value construct at the domain specific level.

The development of a food choice questionnaire (FCQ) by Steptoe et al. (1995) has provided a way to assess nine distinct food choice motives including ethical concern.

Lindeman and Vaananen (2000) indicated that item of ethical concern of FCQ can be modified by including motives such as ecological welfare, political values, and religion. Animal welfare and environmental protection belongs to the scale of Ecological Welfare, but reliabilities for these two subscales are large enough to consider as separate motives in food related studies. Although ethical motives are considered as less important in food choice in general, it is possible to observe some situations and some subgroups of people concern ethical values more important than the other food choice motives (Lindeman and Vaananen, 2000). It is depend on consumers' ability to identify meaningful relation between the products, ethical issues or other concern and values in their everyday lives (Torjusen et al., 2001).

Researchers found that consumers express interest in buying foods produced from environmentally sound manner, because of concern for the external environment. Wandel and Bugge (1997) indicate that 44 % of consumers are interested in foods produced in an ecologically friendly way, while 38 % of consumers willing to pay 10 % more for such foods. In their study, 35 % of consumers have given priority on environmental quality properties than other qualities of foods. Schifferstein and Ophuis (1998) also state that concern for the environment is one of the main reasons for purchasing organic foods. Lea and Worsley (2005) found that most of the women in their sample were more positive for organic foods since they believe that organic foods better for environment than conventional food.

Ethical consideration in animal production process is a condition of the acceptability of the products, but also of the animal production sector as a whole (Marie, 2006). Bennett et al. (2002) found that 76 % of student in their sample were concerned about farm animals may be mistreated, while 34 % avoided products where production methods is unethical (e.g. battery cage eggs). Further, Verbeke and Viaene (1999) reported that Belgium meat consumer concerns about pork and poultry focus on issues like animal welfare and animal friendly production methods. Hence, the ability of the industries to respond to these consumer concerns can be expected to determine its acceptability in the near future. This public concern is reflected by the fact that the welfare of livestock in

farming systems is protected by a number of different legislation. For example, UK's Farm Animal Welfare Council (FAWC) has developed five Freedoms, which require the animals: 1) are free from thirst, hunger, and malnutrition, 2) appropriate comfort and shelter 3) prevention, or rapid diagnosis and treatment of, injury, disease, or infestation, 4) freedom from fear, and 5) the freedom to display most normal patterns of behavior (Bornett et al., 2003). Further, Swiss consumers viewed welfare of farm animals as a public good and expect government to pay attention on that issues (Pan-Huy and Fawaz, 2003).

In the research of Bech-Larsen and Grunert (1998), consumers in Great Britain and Denmark has asked to imagine that they had to choose between ordinary and organic pork and then asked to explain why the product attributes mentioned were important to them. Reasons were mention by respondents such as animal welfare, budgetary restraints, health, and enjoyment. Further the concerns for animal welfare seem to be more important to British consumers. (see Brunso et al., 2002 for a review). In such a situation food choice decision will depend on the prominent value of the individuals' value system. For example, feelings of guilt reduce the palatability of a food, and in order to prevent guilt, consumers may avoid certain type of food (e.g. veal) or food resulted from specific production systems (e.g. battery cages eggs) (Schroder and McEachern, 2004; Dreezens, 2005).

Some studies have shown that demand for ethically labeled products was not increased as anticipated (e.g. Pelsmaker et al., 2005). In some cases consumers' concern for animal welfare issues, may not reflected in their behaviour (Binnekamp and Ingenbleek, 2006). Further, Mceachern and Schroder (2002) shown that there is a gap between consumers' concern about farm animal welfare and sacrifice of personal consumption benefits for animal welfare. Grunert and Juhl (1995) also found similar result for positive environmental attitude and behaviour with respect to the sample of Danish school teachers. Many studies have suggested this discrepancy is resulted due to consumer evaluate product attributes such as price, quality, appearance, convenience and brand familiarity in making choice decisions (e.g. Mceachern and Schroder, 2002; Carrigan and

Attalla, 2001). On the other hand some studies have shown that attitudes alone are poor predictor of purchasing behavior and some other reasons affecting this such as lack of availability of ethically labeled food products and lack of knowledge and information (e.g. Shaw and Clarke, 1999; Mceachern and Schroder, 2002). Further, Vindigni et al. (2002) have state that despite the ethics in consumer values and attitudes, there are different barriers to the diffusion of the ecologically oriented food consumption style since consumers' reluctance to pay higher costs in terms of money, time, and effort for subjectively perceived quality of the ethical food.

In this study I define and measure the animal welfare concern and environmental concern as separate constructs related to both foods in general and seafood in particular. But in order to simplify the model I intended to use only the fish object in the model. The animal welfare concern and environmental concern related to food in general is an important domain specific value construct that lead consumer to consider about these issues related to fish they consume. However a measure of the animal welfare concern and environmental concern related to food in general will also be performed and validated as the constructs since I am not confident that many consumers could be identified the relevance of these two constructs related to the seafood consumption.

2.4.2 Environmental and ethical issues associated with seafood

Although public importance of ethical consideration is increasing, little research has been found in the literature to reveal its association with fish consumer behavior. Therefore information regarding consumer perceptions of environmental and animal welfare concern related to the seafood production and the influence of these perceptions on potential impact on consumer choice of products resulting from the application of such production method is less. Thus a review of existing literature regarding consumers' concern about environmental and animal welfare in seafood production is appropriate at this point. Even consumers feel that their knowledge about fish is little, many consumers have strong beliefs relating to the effects of production method on fish product

characteristics. Therefore impact of extrinsic information about fish on consumer product perception was relatively strong (see Kole et al., 2009 for a review).

In aquaculture sector, good management and environmental attention is essential for both product quality and economic sustainability through consumer acceptability. Further, there are numerous environmental issues related to both wild fish harvesting and the production of farmed fish (see Honkanen and Olsen, 2009 for a review) and several researchers have found that these environmental issues are more important than fish welfare issues for the consumers in fish consumption (e.g. Vanhonacker et al., 2006; Honkanen and Olsen, 2009). Frewer et al. (2005) also reported the similar results by studying on farmed salmon and they found that the consumers are much more concerned about general environmental and sustainability problems related to fishing in general rather than animal welfare issues. Therefore it provide evident that the difference between consumers perceived importance of these environmental concern and fish welfare concern related to domain of fish.

Fish farming companies may find it profitable to invest in more environmentally friendly practices due to increasing demand for more environmentally friendly food products. Some studies have shown that consumers are increasingly concerned about sustainability issues in relation to seafood production by reflecting willingness to pay a higher price for more environmentally friendly seafood products (Tveteras, 2002). Wessells et al. (1999) indicated that consumers who believed that Atlantic cod is severely over fished and are more likely to choose certified and ecolabbled cod over the uncertified cod. On the other hand fish farming is sometimes promoted as a means to protect the wild fisheries and some consumers hold positive attitude towards fish farming as a better production method because it may help to save the wild fish stocks from overexploitation while others think about the genetic contamination of wild fish stock by escapees (see Honkanen and Olsen, 2009 for a review).

When considering the fish welfare issues, researchers has indicated that majority of the respondents in some European countries like Spain, has disagreed with the statements

regarding suffering or violation of animal rights in fish farming. This indicates that fish farming does not seem to arouse animal welfare concerns among the consumers (Honkanen and Olsen, 2009). Further, the literature has shown that refusing to eat wild fish has been related to the sustainability and ethical concerns of a sample of Flemish women. But the decision not to eat farmed fish is associated with a lower expected intrinsic quality rather than considering importance attached to sustainability and ethical issues (Verbeke et al., 2007b). Consumers concern about fish farming and wild fish capture can embrace animal welfare issues related to the right to keep fish in captivity and painful feelings to animals in the process. Some researchers have found that aquaculture production systems are expected to inevitably having challenges regarding acceptable ethical standards (see Verbeke et al., 2007b for a review). From a focus group discussion Verbeke et al. (2007a) found that the consumers have no apparent awareness of farmed fish production system and most consumers not even think about the farmed or wild origin of the fish they buy. But some consumers perceived that wild fish were associated with better fish well being (living free and happiness) and being more resistant against everything (e.g. chemical and microbial contamination).

Verbeke et al. (2007b) found that even consumers attach high perceived importance to Welfare and sustainability related to fish, this perceived importance is not correlated with the fish consumption frequency or general attitude toward eating fish. This result can be further explained by the finding of Berg (2002). He has shown that even 51 % of the consumers think that farmed fish do not live under acceptable conditions, only 9 % of consumers reported that they thought about the wellbeing of farmed fish when buying (see Honkanen and Olsen, 2009). There are some indications that consumers may evaluate farmed fish more negatively than wild caught fish and this significantly influence on choice (Jaffry et al., 2004). However I will focus the consumers' environmental concern and fish welfare concern associated with seafood as separate domain specific value constructs in this study. As the common part of the VAB models related to wild and farmed fish consumption, these two domain specific value constructs will be used.

2.5 Personal values

Personal values are single, stable beliefs that use by individuals to evaluate attitudes and behavior (Rokeach, 1973). They transcend objects, situations, and issues (Schwartz, 1992). For example, if a person holds honesty as a value, the individual would expect to be honest when interacting with friends. Rokeach (1973) defined value is enduring belief that a specific mode of conduct or end state of existence is personally or socially preferable to an opposite or converse mode of conduct or end state of existence along a continuum of relative importance. Personal values are guide the selection or evaluation of behavior, and are ordered by relative importance (Schwartz and Bilsky, 1990). According to Dreezens et al. (2005), once a value is internalized, it becomes a criterion for guiding action and for developing and maintaining attitudes toward relevant objects and situations.

Personal values are closely related to the self since they are centrally located within a person's belief system and therefore difficult to change and are limited in number (Vaske and Donnelly, 1999). For example, Schwartz discussed 10 fundamental values (Schwartz, 1992). Global/personal values are the most central belief category and are not directed towards any specific object or idea (Honkanen et al., 2006). In addition to that the personal values provide standards relating to modes of conduct, goals and evaluations. According to Vaske and Donnelly (1999), global or personal values are unlikely to account for much of the variability in specific attitudes and behaviors because they widely shared by all members of a culture. Therefore it is difficult to find direct relations between these values and specific attitudes.

A value system is represents a learned organization of rules and it helps individual to making choices and resolving conflicts (Rokeach, 1968). Dreezens et al. (2005) explained this by considering an event that people construct an attitude about new technologies like genetic modification. In that case individual will be guided by the values that they find important and if the attitude object fits with a person's values, s/he will make positive attitude toward the object. Personal values are more abstract level of the belief hierarchy

that can be applicable in marketing. According to the study done by Dreezens et al. (2005) shown that some personal values (e.g. universalism, power) are more important in the food choice. Generally, belief is more stable when it located more deeply in the belief hierarchy. Advantage of this nature could be obtained to the marketer if activated, related and facilitated to the satisfaction of certain personal values of consumers through food choice.

A system of personal values that relatively stable among cultures was developed by Schwartz (1992) and many studies have used this Schwartz Value Survey to measure values. It covers 56 values, which refer to ten motivational value types that can be found in every culture. The ten motivational domains of values are self direction, stimulation, hedonism, achievement, power, security, conformity, tradition, benevolence and universalism (Schwartz, 1992). Values that are found most important and guide attitudes and behavior is depend on the individual and cultural differences. Several studies in the literature shows that Universalism and Benevolence values in the Schwartz Value Survey are considered to be relevant to the food attitudes and behavior that arising issues related to environmental protection and animal welfare (e.g. Honkanen and Verplanken, 2004; Lea and Worsley, 2005).

Therefore the higher order value type of self transcendence which consists of universalism and benevolence domains (Schwartz, 1992) considered in this study. Universalism includes values such as equality, protecting the environment and unity with nature (Schwartz, 1992) which focuses on the understanding, appreciation, tolerance, and protection of the welfare of all people and nature while Benevolence values are motivated by the goal of the welfare of those people with whom one is in close contact, and includes values such as helpful, honest and forgiving. By measuring these personal values I expect to find out their relative importance to the consumers as well as the effect of those on environmental and fish welfare concern, attitudes and intention to consume wild versus farmed fish among the Vietnamese consumers.

2.6 The conceptual model and hypotheses

The research assumptions of this study have build on the value attitude behaviour (VAB) hierarchy model. VAB model is one of the most comprehensive theoretical approaches used to understand the consumer behaviour in the literature (e.g. Homer and Kahle, 1988; Honkanen et al., 2006; Vaske and Donnelly, 1999). The key elements of this model are the general values and value orientations (Vaske and Donnelly, 1999; Lea and Worsley, 2005). The principle of the VAB model is that individuals' values flow from general/personal values through value orientations (domain specific values), to influence the individuals' general and domain-specific attitudes which in turn influence to intentions and/or behaviors.

The purpose of the theoretical discussion presented above is to clarify various concepts and to build a conceptual model for this study. It will investigate the values and the difference in consumption, attitudes and intention towards wild versus farmed fish consumption among the respondents in Vietnam. Based on theoretical review, VAB model will be used as the fundamental framework of this study; where, the model will explore the relationship between personal values (self transcendence), environmental concern and fish welfare concern (domain specific values), attitude towards wild/farmed fish and intention to consume wild/farmed fish among the Vietnamese consumers. Based on the preceding discussion, the following hypotheses can be proposed. The conceptual model with overview of the most central hypotheses is presented in figure 2.3.

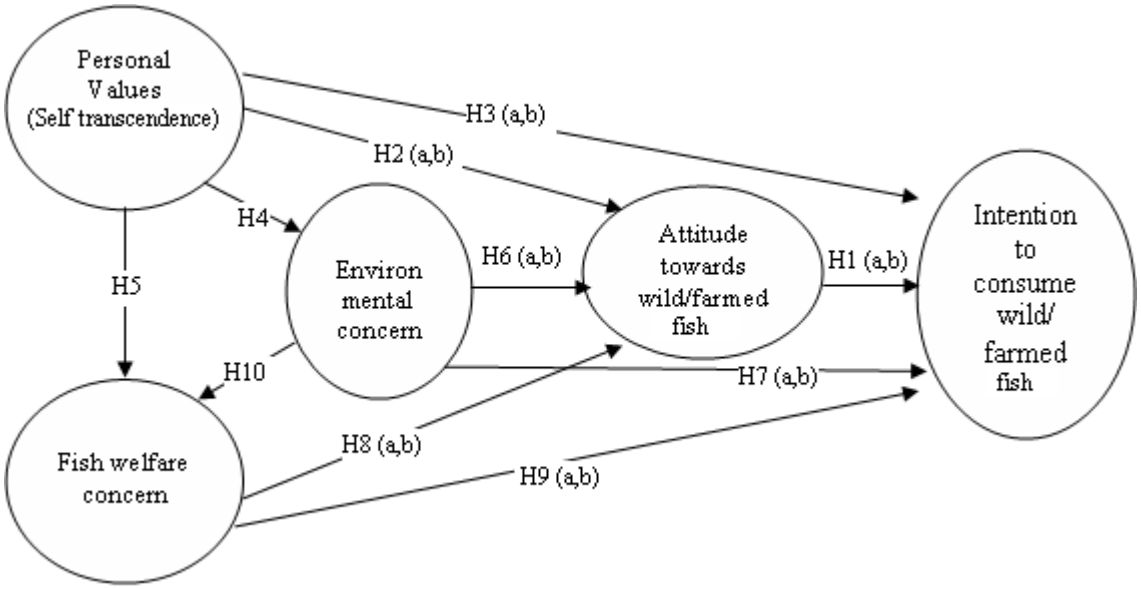


Figure 2.3: The empirical model used for test the relationships

2.6.1 Attitude and intention to consume wild versus farmed fish

Hypothesis 1 concerned the influence of the attitude toward the wild/farmed fish on the consumers' intention to consume wild/farmed fish. Although not specifically describe about wild or farmed origin of the fish, many studies may provide strongest arguments for the hypothesized positive relationship between attitude and intention to consume fish (e.g. Olsen, 2004; Povey et al., 2001; Verbeke and Vackier, 2005). Therefore, on the basis of previous research, attitudes towards wild/farmed fish are expected to influence on intention to consume wild/farmed fish, i.e. the more positive the consumer's attitudes to eating wild/farmed fish, s/he would be more likely to consume the particular fish.

H1a: Attitude toward wild/farmed fish has a significantly positive impact on intention to consume wild/farmed fish.

Further, Bagozzi and Yi (1988) interpreted that the formation of intention is initiated with attitudes and the desire to perform the particular action will be a function of the strength of one's attitude. Honkanen and Olsen (2009) found that consumers' attitude towards wild fish consumption is more strong than the attitude towards farmed fish consumption

in Spain. Farmed fish is also a new industry in Vietnam compared to wild fish. Therefore it is also expected that attitudes towards wild fish consumption have more positive impact on the intention to consume wild fish than that of farmed fish.

H1b: Attitudes towards wild fish consumption have a higher significant positive impact on the intention to consume wild fish than that of farmed fish.

When attitudes are defined as beliefs, the taste-preferences towards seafood are the most important determinant of seafood consumption behaviour (Olsen, 2003). Quality of the seafood and perception of flavour are an important factor influencing the decision to consume or purchase (Kinnucan et al., 1993). Kole et al. (2009) found that when product labelled as wild, judged more favorably in the product attributes than the unlabelled product. Verbeke et al. (2007b) found that the consumers' rejection or acceptance of farmed fish not depend on their perceived importance attached to sustainability and ethical issues. But consumers who refuse eating wild fish showed a significantly higher perceived importance of sustainability and ethical issues. Therefore the following hypothesis can be proposed.

H1c: Consumers beliefs related to quality, availability, price, ethics and sustainability related to wild fish is more positive than that of farmed fish

2.6.2 The influence of personal values

This part has concerned with the influence of personal values on consumers' attitudes and intention to consume wild/farmed fish consumption. In addition to that it has also considered the influence of personal values on environmental concern and fish welfare concern. The self transcendence personal values have been discussed in this study.

The study of Vermeir and Verbeke (2008) shown that consumers, who hold universalism values are, consider the consequences that their behavior has for the environment. These consumers do not want opinions of others to guide sustainable consumer behavior and

they will buy sustainable products for internal personal reasons. Similarly high benevolence consumers or the kind-hearted consumers consider as well the social norms as their own beliefs to motivate sustainable behavioral intention. Even the self transcendence values lead people to think about both environment and animal welfare, when formation of attitude towards fish, consumers' finds much importance of the Environmental issues than fish welfare (Honkanen and Olsen, 2009). Consumer concerns about wild fish harvesting can embrace problems such as overexploitation of fish stocks (Hentrich and Salomon, 2006), damage to the habitat and seabed, may form favorable attitude towards farmed fish (Honkanen and Olsen, 2009). In fish farming, pollution from untreated effluents, escapees (Read and Fernandez, 2003; Kaiser, 1997; Cotter et al., 2000), production of fish feed from human food (Tinarwo, 2006) are potential problem and that may leads to formation of favorable attitude towards wild fish. However, Jaffry et al. (2004) and Kole et al. (2003) has provided some evidence that consumers evaluate farmed fish more negatively than wild fish (see Honkanen and Olsen, 2009), may be concerning the environmental disadvantages of fish farming over wild fish harvesting. Based on above discussion the following hypothesis can be proposed.

H2a: Personal values (self transcendence) have a significant positive impact on attitude toward wild/farmed fish consumption.

H2b: Personal values have a higher significant positive impact on attitude toward wild fish consumption than that of farmed fish.

H3a: Personal values (self transcendence) have a significant positive impact on intention to consume wild/farmed fish.

H3b: Personal values have a higher significant positive impact on intention to consume wild fish than that of farmed fish.

Vaske and Donnelly (1999) mentioned that the influence of personal values on attitudes and behavior occurs indirectly via domain specific values and those domain specific

values helps to strengthen and give meaning to personal values. Study of Raaij and Verhallen (1993) provide strong argument for this relationship. Therefore significant positive relationship between personal value and domain specific value is expected.

H4: Personal values have a significant positive impact on Environmental concern. That is, consumers with stronger emphasis on self transcendence values are more likely to have a stronger emphasis on Environmental concern.

H5: Personal values have a significant positive impact on Fish welfare concern. That is, consumers with stronger emphasis on self transcendence values are more likely to have a stronger emphasis on Fish welfare concern.

2.6.3. The influence of domain specific values

This part has concerned about the influence of domain specific values on consumers' attitudes and intention to consume wild/farmed fish. The Environmental concern related to fish and Fish welfare concern are the domain specific values include in the conceptual model.

Environmental concern

Frewer et al. (2005) found that the Environmental concern is more important for the consumers in selection of fish products than fish welfare issues. There are environmental issues related to both traditional wild fish harvesting and the growing production of farmed fish. Over exploitation and damage to the sea bed by fishing gears are important issues related to wild fish harvesting while pollution, genetic contamination of wild stock, spread of disease are issues associated with farmed fish (Honkanen and Olsen, 2009). Therefore it is expected that the consumers' Environmental concern has a significant impact on attitude and intention to consume wild/farmed fish.

Even there are environmental issues associated with both wild fish harvesting and production of farmed fish, some people may consider fish farming as positive because it

may help to save the wild fish stock from over exploitation (Honkanen and Olsen, 2009). However, recalling the finding of Jaffry et al. (2004) indicating that consumers evaluate farmed fish more negatively than wild fish, may leads to think that possible genetic contamination of wild fish by escapees and other environmental problems caused by fish farming as more worrying issue for some consumers. Therefore based on the theory and prior researches, the following hypotheses can be proposed.

H6a: Environmental concern has a significant positive impact on attitude toward wild/farmed fish consumption. That is, consumers who place stronger emphasis on Environmental concern are more likely to have a positive attitude toward wild/farmed fish consumption.

H6b: Environmental concern has a higher significant positive impact on attitude toward wild fish consumption than that of farmed fish.

H7a: Environmental concern has a significant positive impact on intention to consume wild/farmed fish.

H7b: Environmental concern has a higher significant positive impact on intention to consume wild fish than that of farmed fish.

Fish welfare concern

Concerning fish welfare, the impact of values on attitude can be more questionable because both values and attitudes focus on fish. However, the study of Verbeke et al. (2007b) can be provide strong argument for the hypothesized relationships that describe the impact of fish welfare concern on attitudes and intention to consume wild/farmed fish in this study. They found that the choice not to eat wild fish is mainly caused by the sustainability and ethical considerations, given a significantly higher importance attached to these issues by consumers who refuse to eat wild fish. The consumers who refuse to eat farmed fish interested to know about the fish origin is driven by their preference for wild fish and desired avoidance of farmed fish, which is not driven by the ethical

considerations. Sustainability and ethics are less associated with farmed fish according to the consumers' perceptions of their study. Based on these findings the following hypotheses can be proposed.

H8a: Fish welfare concern has a significant negative impact on attitude toward wild/farmed fish consumption.

H8b: Fish welfare concern has a higher significant negative impact on attitude toward wild fish consumption than that of farmed fish.

H9a: Fish welfare concern has a significant negative impact on intention to consume wild/farmed fish.

H9b: Fish welfare concern has a higher significant negative impact on intention to consume wild fish than that of farmed fish.

The ecological component of the sustainability involves care for the natural environment, including plant and animal production factors and the living environment in general (Vermeir and Verbeke, 2008). Therefore fish as a part of natural environment, consumer who concern about environmental sustainability issues may also concern about fish welfare. Therefore the following hypothesis can be proposed.

H10: Environmental concern has a significant positive impact on Fish welfare concern. That is, consumers who place stronger emphasis on Environmental concern are more likely to have stronger emphasis on Fish welfare concern.

The methodology applied to achieve the objectives will be discussed in the next chapter.

3. Methodology

The process of data collection, questionnaires and analysis methods are discussed in this chapter of the thesis. It has mainly focuses on the designing items to measure the constructs in the questionnaire. Factor analysis, testing for the reliability of constructs, descriptive analysis and structural equation modeling are the main methods discussed in this section.

3.1 Survey design and measurement

Sampling methods can be classified into two broad categories as probability and convenience sampling. Random, stratified, cluster, and multistage sampling designs are sub categories comes under probability sampling. Convenience sampling is a non-probability method, ease of access make this method to use in the research activities (Yu and Cooper, 1983). In this study also the convenience sampling method was used as survey design considering the easy of access to the respondents.

The consumer survey was carried out in Nha Trang, Vietnam in March 2010. First, the English version of the questionnaire was developed. A Vietnamese version was derived by direct translation from the English version. The Vietnamese version was then back-translated into English by a different translator to identify potential problems with the original translation. A Vietnamese version of the final questionnaire was then pre tested using convenience sample of approximately 10 employees of the Nha Trang University. Data were collected by personally delivering the questionnaire to the respondents at their residence or work place and then collected it later at agreed upon time. A convenience sample of 250 respondents was selected and 206 of usable questionnaires could be obtain from the survey.

The measurement items belongs to each constructs used in this study were adopted from previous researches in the literature. Seven point Likert scale, semantic differential scale

and multiple rating list scale (Malhotra, 2006, Honkanen and Olsen, 2009) was used to measure the items under the constructs. The Likert scale ask the respondents to indicate how much they disagree or agree with each of a series of statements about the objects (Malhotra, 2006). The Semantic Differential scale measures people's response to stimulus words attached with bipolar adjectives that have semantic meaning (Malhotra, 2006). The other multiple rating scales are mostly framed from "not important" to "very important". This study presents the questions as they were presented for the respondents (see Appendix 1). By doing this, it can easily be evaluated and used for replication and/or improvement in future research.

3.1.1 Personal value

Personal values were measured with Schwartz Value Survey (Schwartz, 1992), translated into Vietnamese. In this study items were measured by a seven-point scale ranging from 1: Not important to 7: Very important. Universalism dimension consisted of ten items: "Unity with nature", "Inner harmony", "Equality", "Social justice", "Meaning in life", "A world of beauty", "Broad minded", "Protecting the environment", "A world at peace" and "Wisdom". The Benevolence dimension consisted of seven items: "Forgiving", "Loyal", "Honest", "Helpful", "Mature Love", "True Friendship" and "Responsible". Each value is presented with brief explanations of their meanings in parentheses next to the items. The respondents were asked to indicate the level of importance they attach to each personal value measure in the instrument (see Appendix 1.1).

3.1.2 Domain specific values

Several researchers have defined ethical consumption as the purchase of a product that concerns such ethical issues as animal well-being, environmental concern, etc. (see Pelsmacker et al., 2005 for a review). The consumer concern about environmental and animal welfare aspects of the food production and food in general when consumption decision making can be consider as value construct at the domain specific level. Honkanen et al. (2006) also have state that the ethical concern of the consumer in food

choice can be defined under this level. Lindeman and Vaananen (2000) developed a scale to measure ethical food choice motives including ecological motives. Consumers' environmental concern and animal welfare concern are subscales under Ecological motives, but their reliabilities were large enough to consider as separate scales according to their study (Lindeman and Vaananen, 2000). This study used the above sub scales to measure the consumers' Environmental concern and Animal welfare concern related to food in general and related to fish in particular (see Appendix 1.2).

Scale to measure the consumers' *concern about food ethics and production* methods consisted with six items and it has been measured as an attitude. The items were adopted from the scales used by Kyriakopoulos and van Dijk (1998) and v. Alvensleben (1996). This construct was measured by asking respondents with questions such as "I have no ethical and environmental concern about eating food", "I don't like to see any of the unethical food products", "There are a lot of foods I wouldn't buy because of my environmental and ethical concern", "When I think about the way food processors and industries are polluting I get very angry", "I would be willing to stop buying products from companies guilty of polluting the environment" and "Animals suffer too much stress on farms". Respondents were asked to indicate their response on a likert scale ranging from 1 = Strongly disagree, 4 = Neither agree nor disagree and 7 = Strongly agree (see Appendix 1.2.1).

Scale to measure the *Environmental concern for food* consisted with three items adopted from Lindeman and Vaananen (2000), and was measured with a multiple rating list scale ranging from 1 = Not important to 7 = Very important. This construct was measured by asking "It is important to me that the food I eat on a typical day . . ." "Has been produced in an environmentally friendly way", "Has been produced in a way which has not shaken the balance of nature" and "Is produced without negative consequences for the environment and nature" (see Appendix 1.2.2).

Scale to measure the *Animal Welfare concern* for food consisted with three items such as "It is important to me that the food I eat on a typical day . . ." "Has been produced in a

way that animals have not experienced pain", "Has been produced in a way that animals' rights have been respected", "Has been produced in an animal friendly way". This construct also measured with a scale ranging from 1 = Not important to 7 = Very important (see Appendix 1.2.3). This scale also adopted from the scale developed by Lindeman and Vaananen (2000).

Scale to measure the *Environmental concern for fish* consisted with four items, and was measured with a scale ranging from 1 = Not important to 7 = Very important. This construct was measured by using assertions such as "It is important to me that the fish I eat on a typical day . . ." "Has been produced in a way which has not polluted the sea or the other environments", "Has been produced in an environmentally-friendly way", "Is not threatened by over-fishing and loss species on the border of extinction" and "Is produced without negative consequences for the environment and nature" (see Appendix 1.2.4). Similar measures were used by Honkanen and Olsen (2009).

Scale to measure the *Fish Welfare* concern consisted with three items, adopted from Honkanen and Olsen (2009) and Lindeman and Vaananen (2000). The construct was measured with a scale ranging from 1 = Not important to 7 = Very important. The respondents were presented the assertions such as "It is important to me that the fish I eat on a typical day . . ." "Has been caught and produced with respect for their rights and wellbeing", "Has been caught and produced without suffering" and "Has been caught and produced in a friendly way" to measure this construct (see Appendix 1.2.5).

3.1.3 General attitude and attribute beliefs

Attitude toward a behavior is defined as a person's overall evaluation of performing the behavior in question (Ajzen, 2002). Attitude toward wild/farmed fish consumption was firstly assessed as global evaluation without any specificity in times or context when the consumption occurs. In this study, five items were used to assess participant's attitudes toward wild fish and the same five items measured attitudes toward farmed fish. The semantic differential scales are the most commonly used in measuring attitudes (Ajzen,

2002; Ajzen and Madden, 1986). As analogous to previous studies, the participants were asked to rate "how you feel when you eat wild fish as a meal" on five 7- point semantic differential scales with bipolar adjectives varying from 1 (bad/ unsatisfied/ unpleasant/ dull/ negative) to 7 (good/ satisfied/ pleasant/ exiting/ positive) (Olsen, 2003, Tuu et. al., 2008, Verbeke and Vackier, 2005).

In measuring the attitude towards farmed fish the similar procedure were followed, but the respondents were presented with "it is possible that the species of farmed fish you are familiar with is different for the one of wild fish". Then mentioned that "We are interested to know your general opinion about farmed versus wild". Thus, try to think about the same kind of fish you have evaluated in the previous questions (wild) – and think it was farmed" (see Appendix 1.3).

In case of fish consumption, four *salient beliefs* are important in forming attitude as: taste, distaste (negative affect), nutrition and quality/freshness (Olsen, 2004). Kole et al. (2009) found that information about product type, price, freshness and the advantages of fish farming could influence product evaluation by the consumers. Luten et al. (2002) evaluate the wild versus farmed fish in qualities related to (sensory) attributes such as quality, freshness, taste, juiciness, firmness, naturalness, healthy, price, smell and colour in their study. This study assessed different beliefs about wild and farmed fish such as, taste, texture, appearance, healthiness, nutritious, perceived price, availability, freshness, naturalness, smell and some ethical beliefs (see Appendix 1.3.1). Respondents were asked how you would evaluate wild fish as a meal along the following different attributes and each item was coded in semantic differential formats with 7-points scale from "very bad" to "very good", and a neutral score at middle of 4. Similarly, respondents were asked how you would evaluate farmed fish as a meal using similar attributes along the 7-points semantic differential scale.

3.1.4 Intention to consume

Intention is said as a measure of the likelihood that a person will engage in a given behavior (Fishbein and Ajzen, 1975, Ajzen, 1991). In this study intention to consume wild fish was evaluated with four items such as "plan", "expect" "want" and "desire" and these items are commonly used for intention measurement in the literature (e.g. Ajzen, 2002; Armitage and Conner, 2001; Verbeke and Vackier, 2005; Tuu et. al., 2008). The same four items was used to evaluate the intention to consume farmed fish among the respondents. The statements referred to the subjective probability that the individual would engage in the specified behaviour (Fishbein and Ajzen, 1975), therefore measures indicate how likely the respondent to eat wild/farmed fish as a meal during the three coming days. The items were measured using a 7-point rating-scale anchored from 1: Very unlikely to 7: Very likely and at the midpoint 4: Neutral estimation (Appendix 1.4).

3.1.5 Fish consumption frequency

Fish consumption behavior was measured as self-reported frequency of consumption during the last year. The measure of this construct is parallel with some previous studies (e.g. Honkanen and Olsen, 2009). The scale was ranging from never (1) to 5 times a week or more (9). The respondents were asked how many times in average during the last year you have consumed fish in general, wild fish and farmed fish as a meal (see Appendix 1.5).

3.2 Analytical methods and procedures

The objectives of this study are to investigate the consumers' value and the difference in consumption, attitudes and intention to consume wild fish versus farmed fish in Vietnam and further understanding of the relationships among values, attitudes and intention to consume wild versus and farmed fish. The main analytical methods used are descriptive and causal analysis to achieve these objectives. The analytical methods used are described in the following sections of this thesis.

3.2.1. Exploratory factor analysis and test of reliability

Factor analysis is used to find latent variables or factors among observed variables and it used to reduce multiple variables to a lesser number of underlying factors that are being measured by the variables (Churchill, Jr., 1979). Principal component analysis (PCA) is the most common form of factor analysis and it was applied with orthogonal rotation (varimax) in this study for the purposes of overall inspection of the convergent validity of proposed constructs considering the factor loadings of items (Hair et al, 1995). A factor loading is the correlation between a variable and a factor that has been extracted from the data. High factor loadings of items indicate a good convergent validity of the measures in describing the same constructs (Hair et al, 1995).

Bartlett's Test of Sphericity and Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) are used to determine the factorability of the data. The KMO measures the sampling adequacy which should be greater than 0.5 for a satisfactory factor analysis to proceed. Bartlett test of sphericity suggest the probability is less than 0.05 (Pallant, 2005).

Internal consistency is important to consider when items are used to form a scale. It means the all items with in the construct should measure the same things, therefore the reliability of the constructs also tested (Hair et al, 1995). A useful coefficient for assessing internal consistency of measures (reliability) is Cronbach's alpha. Cronbach's alpha reliability coefficient of 0.7 or higher is considered as acceptable (Pallant, 2005), which indicate the higher correlations among measures and higher reliability of measurements.

The factor analysis and reliability test are examine the suitability of measures that used to describe the concept. However the Cronbach's alpha can indicate the uni-dimensionality of multiple-indicators rather than measuring the reliability of the constructs (Hair et al, 1995). Therefore confirmatory factor analysis and discriminant analysis through SEM

was performed as described later in this chapter as more precise way to test the reliability and validity of the measures (Anderson and Gerbing, 1988).

3.2.2. Descriptive analysis and mean difference tests

This study purposes to understand not only causal relationships among constructs but also to investigate consumers values, general patterns of the fish consumption behavior, intention and attitudes toward eating wild versus farmed fish among Vietnamese consumers. In the present study the environmental concern and animal welfare concern related to food in general, attitudes toward food ethics and production method, attribute beliefs and fish consumption behavior were not included into causal model tests. But a full description of these measures is also performed to understand overall responses, general distribution and other aspect of the scales. Descriptive statistics were carried out using SPSS (Version 17.0). Mean differences were tested by using one sample t-test.

3.2.3. Confirmatory factor analysis

Structural equation modeling (SEM) is mainly used technique for test the causal relationships of a model. It was practiced in this study to test the validity of constructs through the measurement model and for investigating the casual relations among constructs within VAB model through structural model estimated (Anderson and Gerbing, 1988). Construct validity is defined broadly as extent to which an operationalization measures the concept it is supposed to measure (Cook and Campbell, 1979). The validity of a construct is examined in aspects of convergence and discriminates. Convergent validity is examined by observing the individual standardized factor loading. Composite reliability and variance-extracted measure for each construct were calculated via a standardized factor loading and measurement error (εj)[1] for the each indicator. An inspection of construct reliability and variance extracted practiced to reveal the reliability of the constructs. An acceptable value for composite reliability is above 0.6

[1] Measurement error can be calculated as 1- (standardized loading) [2] (Hair at el, 1995).

and also the variance-extracted measure for a latent construct should exceed 0.5 (Bagozzi and Yi, 1988). These two indexes can be calculated by using following equations.

$$\text{Composite reliability} = \frac{(\Sigma \text{ std.loading})^2}{(\Sigma \text{ std.loading})^2 + \Sigma \varepsilon j} \quad (3.1)$$

$$\text{Variance extracted} = \frac{\Sigma \text{ std.loading}^2}{\Sigma \text{ std.loading}^2 + \Sigma \varepsilon j} \quad (3.2)$$

Discriminant validity of constructs were evaluated though inter-correlations among sub constructs and it concern about how the constructs distinct from one another. Inter-correlations are significantly high if the constructs are not different from each other. One approach to practice the discriminant analysis is suggested by Bagozzi et al. (1991). For that, pairs of constructs within each subset of measures are examined in a series of two-factor and one-factor confirmatory factor model. Indexes such as the chi-square, Root Mean Square Error of Approximation (RMSEA) of two-factor and one-factor model are practiced to compare the model fit. In this study, to assess the discriminant validity of the subset of measures, adopted a procedure recommended by Fornell and Larcker (1981). It explains that if the average variance extracted from two constructs is higher than the square of correlation between them, the discriminant validity exists.

3.2.4. Structural equation modeling

Structural Equation Modeling (SEM) is one of the most powerful methods of multivariate data analysis and has been proved that SEM functionality is better comparatively with other multivariate techniques (Saghaei and Ghasemi, 2009). SEM is a statistical tool for test and estimates the causal relationships using a combination of data and causal assumptions. In the literature this method also has been applied by researchers to investigate the casual relations among constructs within VAB model (e.g. Honkanen and Verplanken, 2004). After confirming discriminant and convergent validity by

measurement models, structural models (as presented in figure 2.3) were estimated to test the causal relations.

Extend to which the specified model accounted for the data would assess by the researchers with one or more overall goodness-of-fit indices, after estimating a measurement model (Anderson and Gerbing, 1988). The SEM program provides the probability value associated with the chi-square ($\chi 2$), the Goodness of Fit Index (GFI), and the Root mean square residual (RMR) (Joreskog and Sorbom, 1984). Chi-square and Root Mean Square Error of Approximation (RMSEA) are overall fit indices that can be used to test the fitness of model (Saghaei and Ghasemi, 2009) and are relatively insensitive to sample size. Acceptable model fit is indicate by GFI, Normed Fit Index (NFI) and Comparative Fit Index (CFI) value grater than 0.90 and RMSEA and RMR values below 0.08 (Byrne, 2001). This study used the value of Chi-square, RMSEA, NFI, GFI and CFI as criterion to examine the Goodness of Fit of the models. Significance of coefficient estimated in structural models was evaluated through test of p-value (at 5%). The proportion of variance of the dependent variable about its mean that explained by predictor variables (R2) is also calculated.

3.3 Sample

Nha Trang is a coastal city and capital of Khanh Hoa province, on the South Central Coast of Vietnam. The recruiting procedures used in this study do not yield a statistically representative sample of Nha Trang or Vietnam; therefore generalization of the finding to the overall population remains speculative. Filter was used to select the educated respondents and participants who have the main responsibility for buying and preparing foods and seafood in their households. This is the reason why the proportion of less educated people and men was lower in the sample. The educated people were focused since it is assumed that they have some awareness on the concept of sustainability and ethical concerns. If respondents do not familiar with the concept of sustainability and ethical concern related to food/fish, it would be quite difficult for lay people to answer the questions.

Table 3.1: Socio-demographic characteristics of the sample (% of respondents, n = 206)

Gender	Male	18.0	Family size	1-3 persons	19.4
	Female	82.0		4-5 persons	53.9
				≥ 5 persons	26.7
Education	≤ high school	12.6	Family income	< 3 millions	33.5
	> high school	87.4	(VND)/month	3-5 millions	40.8
				> 5 millions	25.7
Age	18-30 years	36.4	Marital status	Single	35.0
	31-45 years	52.9		Married	65.0
	> 45 years	10.7			
	Mean	32.7			

Almost all the respondents (89.3 %) in the sample were less than or at the middle age (45 years). The majority of the respondents in the sample were women (82.0 %). 65.0 % from the respondent were married and the average household size was 4.71 persons. The mean family income of the sample was 4.37 million VND per month (1USD = 19,000VND). 87.4 % of the respondents have education level more than high school. The table 3.1 depicted the socio demographic information (age, gender, marital status, family size, education, and income) of the sample. The next chapter of the thesis will present the results of the data analysis.

4. Results

This part of the thesis presents the results of the data analysis. The result of the exploratory factor analysis is presented at the beginning. Then the results of the descriptive analysis have presented to achieve the first objective of the study. Finally, the results of the structural equation modeling used to test the causal relations of the theoretical model via AMOS 18 to achieve the second objective has presented. A two stage analysis with first estimation of the measurement model and then the structural model was practiced here.

4.1. Exploratory factor analysis and reliability test

The exploratory factor analysis (principle component analysis with varimax rotation and Kaiser normalization) was initially performed on the respondents' responses for the items explaining their personal and domain specific values, and then for the items that describe the farmed versus wild fish consumption (attitude, attributes beliefs and intention for wild and farmed fish separately).

4.1.1 Factor analysis of the values

An exploratory factor analysis for items that explain consumers personal and domain specific values initiated with 36 items. Before conducting the factor analysis, Bartlett tests for presence of nonzero correlations and test of Measure of Sampling Adequacy (MSA) were practiced to check the appropriateness of the data (Hair et al, 1995). The MSA index was 0.85 and the Bartlett test of sphericity was significant at 0.001, indicated an overall suitability of data for exploratory factor analysis to perform.

Principle component analysis for these items yielded eight factors which explain 68.9 % of cumulative variance of the data. Last two factors were excluded from further analysis due to cross loading on the other factors and less factor loadings. All the items belongs to the fifth factor were cross loaded on the other factors except Inner harmony, was

excluded to make simplicity of the model (see Appendix 2). Therefore five factors were selected for further analysis and these factors could explain 55.36% of the variance in the original data (see table 4.1).

Table 4.1: Personal and domain specific values, with Factor loadings, Eigenvalue, variance explained, reliability indicators (Cronbach's Alpha)

Items	**L**	**E**	**V**	**α**
Personal values				
Benevolence		4.69	13.03	0.87
Forgiving	0.77			
Helpful	0.80			
Honest	0.79			
Loyal	0.73			
True Friendship	0.73			
Responsible	0.67			
Forgiving	0.77			
Universalism		2.07	5.74	0.76
Unity with nature	0.77			
Protecting the environment	0.83			
Domain specific values				
Environmental concern for food/fish		5.19	14.4	0.94
Environmentally friendly food	0.78			
Not shaken the balance nature food	0.83			
Without negative envt consequences food	0.79			
Not polluted the sea/other envt	0.78			
Environmentally-friendly way	0.78			
Not threatened by over-fishing	0.80			
Without negative consequences envt.	0.81			
Food/fish welfare		5.29	14.70	0.96
Animals not experienced pain food	0.85			
Animals' rights respected food	0.85			
Animal friendly way food	0.85			
Respect for fish rights and wellbeing	0.88			
Produced without suffering	0.91			
Caught/produced in a friendly way	0.86			
Attitude towards food ethics & production		2.70	7.49	0.76
Don't like to see unethical food	0.61			
Lot of foods I wouldn't buy environmental..	0.65			
Way food processors polluting, I get very angry	0.78			
I'm don't buy product from guilty of polluting	0.73			
Animals suffer too much stress on farms	0.64			
Total variance explained			55.36	

Extraction Method: Principal Component Analysis, Rotation Method: Varimax with Kaiser Normalization,
Note: *F = Factor Loadings, E = Eigenvalue V = Variance Explained (%), α = Cronbach's Alpha*

The exploratory factor analysis yielded two factors of self transcendence values permitting include them as separate constructs of *Universalism* and *Benevolence* in the model (see table 4.1). Further, it was extracted the items related to Environmental concern for food and Environmental concern for fish in to a single factor named *Environmental concern for food/fish*. Similarly, factor of *Food/fish welfare* was resulted from the items related to Food welfare and Fish welfare. However, to be consistent with the conceptual discussion presented in chapter 2, the VAB model for wild and farmed fish have to be presented with domain specific values of Environmental concern for fish and Fish welfare concern as common constructs for both models. Therefore the construct to measure the Environmental concern for fish was adopted from the factor *of environmental concern for food/fish* to form a separate construct. Similarly construct to measure the Fish welfare concern was adopted from the factor of *Food/fish welfare*. These selected items also have high reliability value to be considered as separate constructs (Cronbach's Alpha of 0.94 for both Environmental concern for fish and Fish welfare). The rest part of the factor of *environmental concern for food/fish* and factor of *Food/fish welfare* adopted as constructs to measure the Environmental concern for food (Cronbach's Alpha = 0.88) and Food welfare (Cronbach's Alpha = 0.93) respectively to discuss in the descriptive part. The factor of *Attitude towards food ethics and production* has also described in the descriptive part of this study.

4.1.2 Factor analysis of the items explain the farmed versus wild fish consumption

The second and third exploratory factor analyses were conducted for the items related to farmed versus wild fish consumption separately. These items are related to consumers' attitude, attribute beliefs and intention to consume wild and farmed fish. The MSA index Bartlett test of sphericity was indicated the suitability of data for exploratory factor analysis to perform (MSA index = 0.89; Bartlett test of sphericity was significant at 0.001 for both). The results of the factor analysis with factor loadings, Eigenvalues, variance explained and reliability indicators for items related to wild versus farmed fish consumption has presented in the table 4.2.

Table 4.2: Attitude, attribute beliefs and intention for wild and farmed fish consumption, with Factor loadings, Eigenvalues, variance explained and reliability indicators (Cronbach's Alpha)

Items	**Wild**				**Farmed**			
	L	**E**	**V**	**α**	**L**	**E**	**V**	**α**
Attitudes		5.13	24.41	0.93		4.20	20.02	0.93
Bad/Good	0.83				0.83			
Unsatisfied/Satisfied	0.87				0.83			
Unpleasant/pleasant	0.87				0.82			
Dull/Exiting	0.85				0.82			
Negative/Positive	0.75				0.80			
Quality & availability		3.79	18.04	0.81		5.36	25.52	0.84
Not nutritious/ nutritious	0.72				0.82			
Less/more available	0.72				0.74			
Not/very fresh	0.71				0.63			
Unnatural/Natural	0.73				0.79			
Welfare & sustainability		1.91	9.07	0.68		1.65	7.88	0.62
Unethical/ethical	0.80				0.78			
Bad/good for environment	0.80				0.79			
Intention		3.35	15.95	0.91		3.59	17.08	0.95
I plan to eat	0.81				0.87			
I expect to eat	0.87				0.90			
I want to eat	0.91				0.91			
I desire to eat	0.86				0.89			
Total variance explained			67 %				70 %	

Extraction Method: Principal Component Analysis, Rotation Method: Varimax with Kaiser Normalization,
Note: *L= Factors Loadings; E= Eigenvalue; V= % of variance explained; α = Cronbach's Alpha*

Principal components analysis started with 21 items that covering consumer attitudes, attributes beliefs and intention to consume wild and farmed fish. Items related to wild fish consumption was resulted five factors explaining 73 % of cumulative variance and items related to farmed fish consumption was resulted four factors explaining 70 % of cumulative variance (see table 4.2). Since this study considered the wild versus farmed

fish, the same items were adopted from the results of above factor analysis. Therefore the fifth factor resulted from factor analysis of the items related to wild fish consumption, "Expensive/ Cheap" was excluded. And also items of "texture", "appearance" and "healthiness" were excluded from the first factor of items explaining farmed fish consumption (see appendix 3 and 4). Although the taste and health aspects are most important predictors of food/seafood consumption (Olsen, 2003), it was excluded from the further analysis due to cross loading and less factor loadings in both factor analyses (see appendix 3 and 4).

4.2 Descriptive analysis

This section will present the descriptive results of the constructs discussed in the theory. The first objective of this study was to investigate consumers' value and the difference in consumption, attitudes and intention to consume wild fish versus farmed fish in Vietnam. Therefore presenting the following results of descriptive part was to fulfill this objective. For that, the per cent distributions and average values of consumption, attitude towards wild and farmed fish, attribute beliefs and intention to consume has presented. The mean values of consumers' responses for the personal values, environmental concern and ethical opinions also presented to understand their values.

Further, it was aimed to discuss the domain specific values of Environmental concern for food, Food welfare as parallel to the Environmental concern for fish and Fish welfare which concerned as separate constructs in the theoretical discussion. In addition to that, Attitude towards food ethics and production that act as a bridge between the domain specific values and specific attitude toward wild and farmed fish consumption has also focused here.

4.2.1 Consumers personal values, environmental concern and ethical opinions

Table 4.3 has summarized the mean values of consumers' personal values, environmental concern and welfare concern for food and fish. All the self-transcendence personal values

are seems to be very important for the consumers. However the mean values indicated that the Benevolence have been considered much important than the Universalism values. The average mean value of the Benevolence were 5.9 on a 7-point multiple rating scale and the average mean value of the Universalism were 5.5 on a same scale. It means that enhance of the welfare of those people with whom one is in frequent personal contact was quite important to the consumers than welfare of all people and nature (Grunert and Juhl, 1995).

The consumers were reported that the food they consume in a typical day has been produced an environmentally friendly way, without shaken the balance of nature and with out causing negative impact to the nature was quite important to them (the average mean value was 5.2 on a 7-point multiple rating scale). They also reported that the welfare issues related to the food they consume was slightly important to them (the average mean value was 4.8), but not much important as the environmental issues. The one sample t-test indicated that the importance of environmental issues related to food is significantly higher than that of welfare issues at 95 % confidence interval.

The results of respondents' environmental and welfare concern for food were accordance with these issues related to the fish. The fish they eat has been produced in a way which not threatened by extinction or over fishing seems to be more important to the consumers than other environmental issues such as pollution and produced in an environmentally friendly way. The consumers have considered that the environmental concern for fish is slightly more important to them (average mean value was 5.3) than those related to food in general. But when it comes to welfare issues, they have found somewhat less importance in fish welfare issues (average mean value was 4.1) than food welfare issues. However they could differentiate between environmental or sustainability issues and welfare issues related to both food and fish, in which the environmental issues have been considered as more important. It is important to note that all these constructs (table 4.3) has been measured in a same scale (7-point multiple rating scale)

Table 4.3: Consumers' personal values, environmental concern and welfare concern for food and fish (mean values)

Variables	**Mean(SD)**
Personal values	
Benevolence	
Forgiving	5.7(1.1)
Helpful	5.8(1.1)
Honest	5.8(1.2)
Loyal	5.9(1.1)
True Friendship	6.1(1.1)
Responsible	6.2(1.1)
Universalism	
Unity with nature	5.5(1.4)
Protecting the environment	5.6(1.3)
Domain specific values	
Environmental concern for food	
Produced in an environmentally friendly way	5.2(1.4)
Produced without shaken the balance of nature	5.1(1.3)
Produced without negative impact to the nature	5.2(1.4)
Food Welfare	
Produced with animals have not experienced pain	4.8(1.4)
Produced with animals' rights have been respected	4.7(1.4)
Has been produced in an animal friendly way	4.8(1.5)
Environmental concern for fish	
Not threatened by extinction	5.5(1.4)
No negative consequences environment	5.4(1.3)
Not polluted the sea/other environment	5.2(1.5)
Environmentally-friendly way	5.2(1.3)
Fish welfare	
Produced without suffering	4.1(1.4)
Produced in a environmentally friendly way	4.2(1.4)
Respect for fish rights and wellbeing	4.0(1.4)

The consumers' attitude towards food ethics and production were measured with six items and one item (I have no ethical and environmental concern about eating food) excluded since it had less factor loading and has loaded under different factor. All these items have been measured in a 7-point likert scale. In average, the respondents were neutral or slightly agreed in their responses to "I don't like to see any of the unethical food products", "Lot of foods I wouldn't buy because of my environmental and ethical concern" and "animal suffer too much on farms" may indicate their less awareness about these problems. But they get angry when think about the way food processors are polluting the environment and willing to stop buying products from companies guilty of

polluting the environment, may explain the consumers' higher reaction on the negative information regarding the environmental problems associated with the food products. However, these results indicated that the consumers considered food production method in forming attitudes towards foods (see table 4.4).

Table 4.4: Consumers' Attitude towards food ethics and production (mean values)

Variables	Mean(SD)
Attitude towards food ethics and production	
I don't like to see any of the unethical food products	4.6(1.8)
Lot of foods I don't buy, due to my environmental and ethical concern	4.3(1.5)
When I think about the way food processors and industries are polluting I get very angry	5.0(1.6)
I would be willing to stop buying products from companies guilty of polluting the environment	5.4(1.7)
Animals suffer too much stress on farms	4.5(1.6)

4.2.2 Attitude toward the consumption of wild/farmed fish

Respondents' attitude towards the wild/farmed fish consumption was measured as a global evaluation by asking their feeling of bad/good, unsatisfied/satisfied, unpleasant/pleasant, dull/exiting, negative/positive when eat particular fish type along a 7-point semantic differential scale. Since the results are very close in all the items, study selected to report the frequencies of item Unsatisfied/satisfied which reported the highest factor loadings. Table 4.5 presents the per cent of consumers' responses to the attitude toward the consumption of both fish types.

The results shows that majority of respondents (82.5 %) in this study were satisfied when eating wild fish while 50.5 % were satisfied when eating farmed fish. In average, the respondents were slightly or quite satisfied (5.4) towards wild fish while they were neutral (4.4) toward the farmed fish. The results of one-sample t-test suggested that the mean difference between attitudes towards wild and farmed fish consumption was statistically significant at 95 % confidence interval. However, about 22.3 % of

respondents were expressed very satisfied attitude towards the wild fish consumption and only 6.3 % of respondents were very satisfied towards farmed fish consumption.

Table 4.5: Attitudes toward wild/farmed fish consumption (% of the sample)

Items	1	2	3	4	5	6	7	Avg.
Un/satisfied (wild)	1.9	1.0	6.3	8.3	28.2	32.0	22.3	5.4 a[1]
Un/satisfied (farmed)	2.4	2.9	20.4	23.8	30.1	14.1	6.3	4.4 b

[1]*Average scores with different letters are significantly different (one-sample t-test, p <0.01)*

This study considered the attribute beliefs about the wild and farmed fish products as major determinants of attitude toward the fish consumption. Attribute beliefs toward both fish products were assessed by number of items. The exploratory factor analysis extracted 2 factors of attribute beliefs such as *quality and availability* and *welfare and sustainability*. Descriptive analysis was conducted to understand the general distribution of these beliefs related to wild and farmed fish among the respondents in the sample.

Majority of the respondents (71 %) evaluated wild fish from slightly fresh to very fresh and about 60 % of consumers evaluated farmed fish similarly (see table 4.6). In average the respondents were evaluated wild fish as slightly or quite fresh (5.3) than farmed fish. (5.0). The mean difference between wild and farmed fish in term of freshness of the product was significant at 95 % confidence interval (p=0.002).

Table 4.6: Attribute beliefs (freshness) related to wild and farmed fish (% of the sample)

Items	1	2	3	4	5	6	7	Avg.
Not/very fresh (wild)	0.0	2.9	6.8	18.4	20.9	23.8	26.2	5.3a[1]
Not/very fresh (farmed)	0.5	4.4	11.2	23.3	18.4	21.8	20.4	5.0b

[1]*Average scores with different letters are significantly different (one-sample t-test, p <0.01)*

Nearly half of the respondents evaluated wild fish as very nutritious and only about 20 % of consumers evaluated farmed as very nutritious (see table 4.7). In average the respondents were evaluated wild fish is quite nutritious (6.1) than farmed fish (5.2). When consider the average difference of consumer responses, they were evaluated wild fish is significantly high nutritious than farmed fish (p=0.000).

Table 4.7: Attribute beliefs (nutritious) related to wild and farmed fish (% of the sample)

Items	1	2	3	4	5	6	7	Avg.
Not/nutritious (wild)	0.0	0.5	2.4	9.2	11.7	27.2	49.0	6.1a[1]
Not/nutritious (farmed)	0.5	1.0	7.8	20.4	25.2	25.2	19.9	5.2b

[1]*Average scores with different letters are significantly different (one-sample t-test, p <0.001)*

Majority of the respondents (81%) evaluated wild fish as slightly natural to very natural and only 49 % of consumers evaluated farmed fish in similar manner (see table 4.8). In average the respondents were evaluated wild fish as slightly or quite natural (5.6) than farmed fish (4.6). The results of one-sample t-test suggested that the mean difference between wild and farmed fish in term of naturalness of the product is statistically significant at 95 % confidence interval (p=0.000).

Table 4.8: Attribute beliefs (natural) related to wild and farmed fish (% of the sample)

Items	1	2	3	4	5	6	7	Avg.
Un/natural (wild)	0.0	0.5	3.9	14.1	25.2	28.2	27.2	5.6a[1]
Un/natural (farmed)	4.4	7.8	14.1	24.3	17.5	16.0	16.0	4.6b

[1]*Average scores with different letters are significantly different (one-sample t-test, p <0.001)*

Majority of the respondents (80%) reported that availability of wild fish was not a limiting factor to them (see table 4.9). About 60 % of the respondents were perceived that farmed fish is slightly available or very available to them. In average, they were evaluated wild fish has significantly higher availability than farmed fish (p=0.000).

Table 4.9: Attribute beliefs (availability) related to wild and farmed fish (% of sample)

Items	1	2	3	4	5	6	7	Avg.
Less/more available	1.0	2.9	2.9	18.4	18.0	30.6	26.2	5.5a[1]
Less/more available	0.5	1.5	6.8	32.0	19.9	26.7	12.6	5.0b

[1]*Average scores with different letters are significantly different (one-sample t-test, p <0.001)*

In average, the respondents were believed that there is no difference between wild and farmed fish in term of Unethical/ethical attributes (average value was 4.8 for both products) (see table 4.10). However 18 % of the respondents were evaluated farmed fish as unethical and this was only about 10 % related to the wild fish.

Table 4.10: Beliefs about the fish welfare related to wild and farmed fish (% of sample)

Items	1	2	3	4	5	6	7	Avg.
Unethical/ethical (wild)	2.9	1.9	5.8	33.0	26.2	18.4	11.7	4.8a[1]
Unethical/ethical (farmed)	1.9	1.0	15.0	28.6	21.8	16.5	15.0	4.8a

[1]*Average scores with different letters are significantly different (one-sample t-test, p <0.01)*

55 % of the respondents were evaluated wild fish as slightly good to very good for environment and this was about 48 % related to the farmed fish (see table 4.11). How ever, in average, the respondents were believed that there is no difference between wild and farmed fish in sustainability point of view (average value was 4.5 for both products).

Table 4.11: Beliefs about the environmental issues related to wild and farmed fish

Items	1	2	3	4	5	6	7	Avg.
Bad/good to envt. (Wild)	3.4	5.3	9.7	26.7	32.0	14.6	8.3	4.5a[1]
Bad/good to envt.(Farmed)	2.9	6.3	10.2	32.0	19.9	18.0	10.7	4.5a

[1]*Average scores with different letters are significantly different (one-sample t-test, p <0.01)*

These findings about the attributes beliefs related to wild and farmed fish supported the H1c of this study; consumers beliefs about quality, availability, price, ethics and sustainability related to wild fish is more positive than that of farmed fish. The item of price not extracted from the factor analysis, however in average, the consumers' belief about the price of the both product was neutral or slightly cheap (wild fish = 4.3; farmed fish = 4.6).

4.2.3 Intention to consume wild/farmed fish

Intention to consume fish were measured with 4 items by asking respondents plan/expect/ want and desire to eat wild/farmed fish during the 3 coming days on a 7-point rating-scale anchored from 1: Very unlikely to 7: Very likely. However, the study does not need to report frequencies for all items, because the results are almost similar.

The results shows that relatively higher per cent of the respondents were very likely expect to eat wild fish (24.3 %) during 3 coming days, while less per cent very likely expect to eat farmed fish (5.3 %) (see table 4.12). The highest per cent of the respondents

were neutral in expressing their intention to consume wild or farmed fish. It may explain that even the consumption is high, fish as a general food in Vietnam, the consumers may not have strong intention towards the consumption. When consider the average of the consumer responses to the question, they were slightly likely to consume wild fish and slightly unlikely to consume farmed fish during 3 coming days. The results from the one-sample t-test suggest that the intention to consume wild fish is significantly higher than farmed fish.

Table 4.12: Intention to consume wild/farmed fish (% of the sample)

During the 3 coming days	Very unlikely		Neutral estimation			Very likely		Avg.
	1	**2**	**3**	**4**	**5**	**6**	**7**	
I expect to eat (wild)	1.0	1.5	5.3	29.6	18.0	20.4	24.3	5.2a[1]
I expect to eat (farmed)	9.7	10.7	13.1	32.0	18.4	10.7	5.3	3.9b

[1]*Average scores with different letters are significantly different (one-sample t-test, p <0.01)*

4.2.4 The fish consumption frequency

The respondents' fish consumption behavior was assessed by the self-reported frequency of past behavior. They were asked to report the number of times on average during the last year they consumed fish in general, wild fish and farmed fish as a meal. The per cent of respondents along 9-point scale of consumption frequencies are shown in the table 4.13.

Table 4.13: Fish consumption frequencies (% of the sample)

	Less or never	1-2 times a year	2-5 times per 6 month	1-3 times months	Once a week	Twice a week	3 times Per Week	4 times Per week	5 times Per week	Avg.
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	
Fish in general	0.0	1.5	1.5	2.4	6.3	10.2	20.9	22.8	34.5	7.5a[1]
Wild fish	1.0	4.9	6.3	6.8	8.3	16.0	23.3	18.4	15.0	6.4b
Farmed fish	12.6	11.2	15.0	18.0	17.0	12.6	7.3	4.4	1.9	4.2c

[1]*Average scores with different letters are significantly different (one-sample t-test, p <0.01)*

The majority of the respondents in the sample (78.2 %) consumed fish (in general) three times per week or more. There were no consumers who do not consume fish as a meal and relatively a high per cent (34.5 %) of consumers eat fish five times or more per week. The consumers' consumption frequency of wild fish is higher when compared with farmed fish (see table 4.5). Relatively higher per cent of respondents (12.6 %) reported that they never consume farmed fish. The result of the t-test suggested that the average consumption of wild fish was significantly higher than the consumption of farmed fish.

4.3 Test of the conceptual model

The objective of this section is to explore the relationships among the values, attitudes and intention to consume wild fish versus farmed fish. Causal models for wild and farmed fish as presented in figure 2.2 were estimated by SEM. A two-step model validation procedure was followed as suggested by Anderson and Gerbing (1988). For that, first examined the purifiers of the measurement models and then tests the proposed theoretical structures.

4.3.1. Confirmatory factor analysis of VAB model

The theoretical model shown in figure 2.2 consisted with five constructs. But factor analysis yielded two dimensions of personal values (universalism and benevolence) instead of concerning it as a single construct of self transcendence values. As mentioned early in this chapter, in order to focus on environmental concern related to fish, the relevant 4 items were selected from the factor of *Environmental concern for food/fish*. Similarly, 3 items explain the fish welfare was selected from the factor of *Food/fish welfare*. The items related to environmental concern for food and food welfare was omitted from the confirmatory factor analysis because consumers response to these items more close and parallel to the environmental concern for fish and fish welfare (Cronbach's Alpha of the factor of *Environmental concern for food/fish* was 0.94 and Cronbach's Alpha of the factor of *Food/fish welfare* was 0.96). Therefore, with the two dimensions of personal values, the model consisted with six constructs. A confirmatory factor analysis for these six constructs initiated with 24 items for each model (4 items to measure intention to consume wild/farmed fish, 5 items to measure attitudes towards wild/farmed

fish, 3 items to measure fish welfare, 4 items to measure environmental concern related to fish, 6 items to measure the Benevolence values and 2 items to measure Universalism values).

The initial confirmatory factor analysis of the measurement model included the factors with items that identified from the exploratory factor analysis did not produced a very good empirical results for either wild or farmed fish model (for wild fish: GFI=0.83, RMSEA=0.072; for farmed fish: GFI=0.85, RMSEA=0.062). Therefore, decided to remove the items with large residuals and less factor loadings from the analysis. This process resulted in two item of the attitude constructs ("Bad/Good and Negative/Positive"), one item of intention ("I plan to eat") and three items from personal values (Forgiving, True Friendship and Responsible) related to both models were dropped from further analysis (Anderson and Gerbing, 1988). Thus, the final measurement model for two fish types consists of eighteen items related to the six constructs used. The Goodness-of-Fit Measures of the measurement model are presented at the bottom of table 4.14. The RMSEA was 0.058 for wild fish model and 0.056 for farmed fish model which lesser than 0.08 indicating acceptable model fit. The other fit indexes (GFI, CFI and NFI) are equal or far above the advocated fit level of 0.90 for both models (Hair et al., 1995).

Once identified the measurement models that fit with the data, separate confirmatory factor analysis were conducted to test the construct reliability. Three different measures of internal consistency or reliability computed from the confirmatory factor analysis are presented in table 4.14. Convergent validity was determined by studying the individual item loadings on the constructs. Therefore the item reliability or factor loadings calculated and all these values were higher than 0.60 except the item of "Loyal" (0.5) of Benevolence values. T-values associated with factor loadings were all significant ($p<0.001$), ranging from 9.12 to 17.84 for wild fish model and from 10.11 to 18.95 for farmed fish model, which satisfies the criteria for convergent validity of the six constructs (Bagozzi et al., 1991).

Table 4.14: The measurement model results of models for wild and farmed fish

Items	**Wild**				**Farmed**			
	L	t.value	CR	VE	L	t.value	CR	VE
Benevolence values			0.68	0.40			0.62	0.35
Loyal	0.50	10.50			0.50	10.49		
Helpful	0.66	12.45			0.67	12.51		
Honest	0.61	11.89			0.61	11.81		
Universalism values			0.56	0.40			0.56	0.39
Unity with nature	0.52	9.13			0.54	9.16		
Prot. Environment	0.72	10.33			0.70	10.10		
Environmental concern			0.87	0.63			0.87	0.63
No negative consequences	0.86	17.24			0.85	17.20		
Not threatened by extinction	0.77	15.73			0.76	15.65		
Envt. friendly way	0.78	15.90			0.78	16.00		
Not polluted sea/other envt.	0.76	15.58			0.76	15.62		
Fish welfare			0.89	0.73			0.89	0.73
Produced in a friendly way	0.80	16.32			0.80	16.32		
Produced without suffering	0.86	17.40			0.86	17.39		
Respect for fish rights	0.89	17.84			0.89	17.84		
Attitudes			0.82	0.61			0.81	0.58
Unsatisfied/Satisfied	0.85	16.75			0.78	15.37		
Unpleasant/pleasant	0.77	15.55			0.77	15.33		
Dull/Exiting	0.71	14.61			0.69	14.11		
Intention to consume			0.81	0.59			0.87	0.70
Expect to eat	0.69	14.18			0.79	16.03		
Want to eat	0.89	17.29			0.96	18.95		
Desire to eat	0.71	14.47			0.74	15.36		

Wild fish: $\chi 2=201.97$, df=120, p=0.000; RMSEA=0.058; GFI=0.90; CFI=0.97; NFI=0.93
Farmed fish: $\chi 2=196.1$, df=120, p=0.000; RMSEA=0.056; GFI=0.90; CFI=0.97; NFI=0.93
***Note:** L= Loadings; CR= Composite reliability; VE=Variance extracted*

Other two reliability measures are the composite reliability and variance extracted and these two criteria were used to examine the construct reliability (Fornell and Larcker, 1981). Composite reliability and variance-extracted scores were calculated according to equations of 3.1 and 3.2. Composite reliability should be greater than or equal to 0.60 and variance extracted should be greater than or equal to 0.50 (Bagozzi and Yi, 1988; Hair et al, 1995). In this study, composite reliability scores of all constructs exceed the recommended level of 0.6 for both models except Universalism value (0.56). The variance-extracted also exceed the recommended level of 0.5 for all constructs of both models except the Universalism and Benevolence values (wild fish model: 0.40 for both values; farmed fish model: 0.39 and 0.35 for Universalism and Benevolence respectively)

(see table 4.14). However, the study choose to keep the Universalism and Benevolence values in the models since it has shown to have an influence on food choice in earlier studies as mentioned in the second chapter. Also the Universalism and Benevolence values were measured as in Schwartz Value Survey (1992), which have proved to be a valid measure in many studies (Grunert and Juhl, 1995).

Table 4.15: Correlations of the constructs used in the VAB model for wild and farmed fish

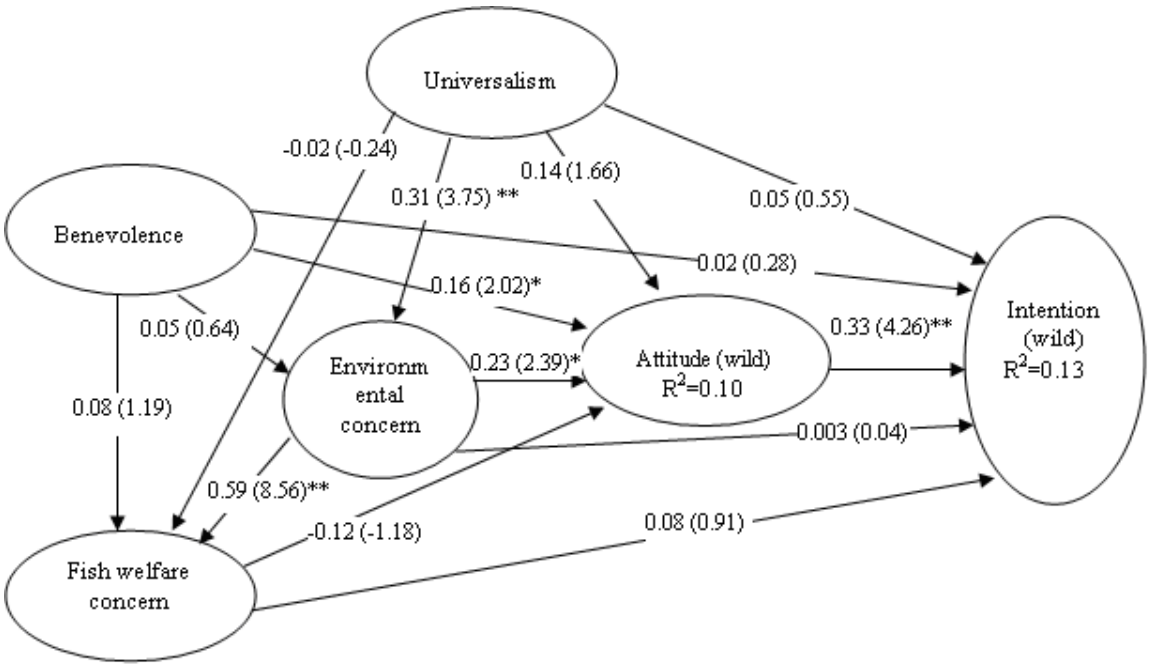
Wild / Farmed	1	2	3	4	5	6
1.Universalism	1	0.36**	0.28**	0.18**	0.21**	0.14*
2.Benevolence	0.36**	1	0.14	0.13	0.20**	0.08
3.Envir.Concern	0.28**	0.14	1	0.56**	0.22**	0.14*
4.Fish welfare	0.18**	0.13	0.56**	1	0.08	0.13
5.Attitude	-0.02	0.05	0.12	0.09	1	0.35**
6.Intention	-0.04	-0.08	0.11	0.05	0.45**	1

*** Correlation is significant at the 0.01 level (2-tailed), *. Correlation is significant at the 0.05 level (2-tailed), **Note:** Correlations presented above the diagonal of the matrix for constructs of wild fish model; below the diagonal for constructs of farmed fish model*

The correlations among the measures used in the two models in this study are listed in table 4.15. The measures of Universalism and Benevolence values, environmental concern for fish, fish welfare concern, attitude towards wild/farmed fish, intention to consume wild/farmed fish were examined to establish discriminant validity. Discriminant validity exists if the average variance extracted from two constructs is higher than the square of the correlation between that particular two constructs (Fornell and Larcker, 1981). For both models, the square of the correlations between the constructs were all less than 0.32 (see table 4.15 for correlations between the constructs). The average variance extracted for two constructs was above 0.40 and 0.37 for wild and farmed fish models respectively, and is in all instances higher than the square of the correlations between the corresponding pairs of constructs. This confirms that the constructs used in both models can be treated as separate constructs in the structural models proposed in this study (fig. 2.1).

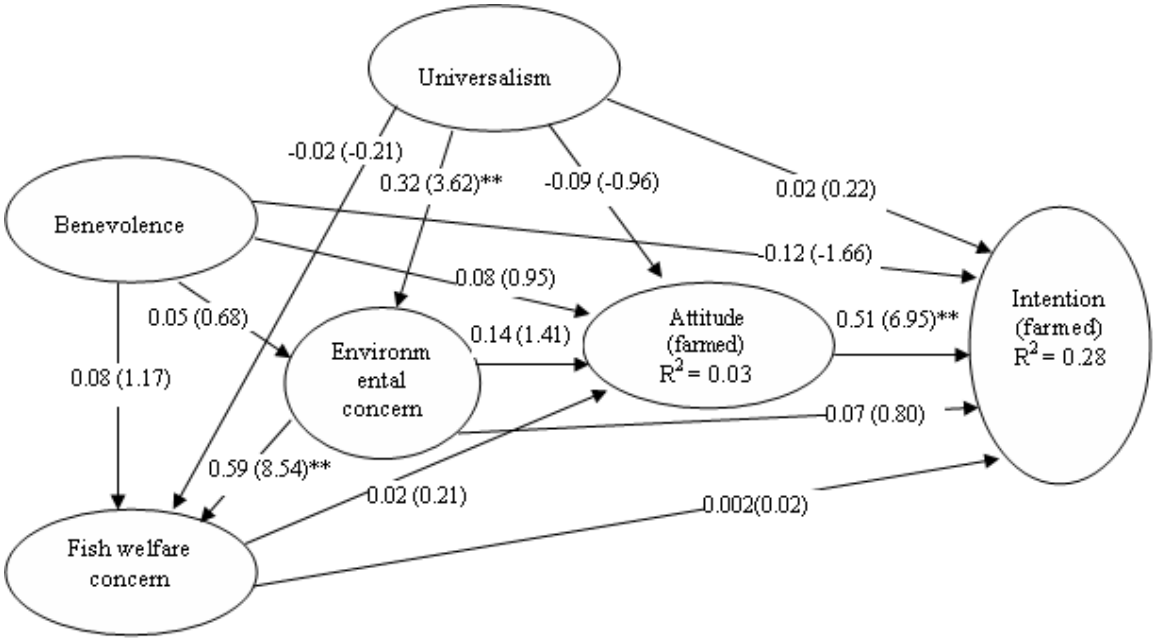
4.3.2. Structural model evaluation

Table 4.16 presents the results of testing the proposed theoretical models using structural equation analysis. The chi-square of the wild fish model was 231.7 with 121 degrees of freedom ($p<0.0001$). The chi-square value of the farmed fish model was 225.8 with 121 degrees of freedom ($p<0.0001$). The RMSEA values were 0.067 for wild fish and 0.065 for farmed fish, which are within the recommended level of 0.08 (Browne and Cudeck, 1992). GFI value was slightly below the recommended level of 0.90 for wild and farmed fish models, which was 0.89 for both models. CFI was 0.96 for both wild and farmed fish models, those clearly exceed the recommended level of 0.90 (Bollen, 1989). Therefore the structural models for both wild fish and farmed fish were Good-Fit with the data from several fit indices.



***: significant at 1 %; *: significant at 5 %*

Figure 4.1a: Standardized regression coefficient of proposed model for wild fish, t-value in the parentheses



***: significant at 1 %; *: significant at 5 %*

Figure 4.1b: Standardized regression coefficient of proposed model for farmed fish, t-value in the parentheses

Table 4.16: Goodness-of-fit test for the proposed structured models for wild and farmed fish

Goodness-fit indices	Proposed Model (Wild fish; Fig. 4.1a)	Proposed Model (Farmed fish Fig.4.1b)
Chi-square	231.74	225.84
Degrees of freedom	121	121
Probability (P)	0.000	0.000
RMSEA	0.067	0.065
Goodness of fit index (GFI)	0.89	0.89
Comparative fit index (CFI)	0.96	0.96
Normed fit index (NFI)	0.92	0.92

It was also examined residuals of observer variables and they were all significant at 1 % except the residual associated with universalism value of "protecting the environment" in wild fish model. In the farmed fish model the residuals of observer variables were all significant at 5 % level. Variances are all less than 2.0 for both models. The results of standardized regression coefficient from the estimation of the proposed models have presented in figure 4.1a and 4.1b, the t-values associated with the coefficient has presented in the parenthesis.

4.3.3 Hypotheses testing

In terms of the hypotheses developed, five of the ten hypotheses were partially or fully confirmed; table 4.17 provides a summary of the results. As hypothesized (H1a), attitudes toward wild and farmed fish consumption were significant and positively related to the intention to consume wild and farmed fish. The attitudes toward wild fish consumption had a path coefficient of 0.33 ($t = 4.26$; $p<0.001$), and the attitudes toward farmed fish consumption had a path coefficient of 0.51 ($t = 6.95$; $p<0.001$), revealing a direct and significant positive relationship between attitude and intention. Therefore H1a was accepted. However, attitudes towards farmed fish consumption had a higher significant impact on the intention to consume farmed fish than that of wild fish, therefore the H1b was not accepted.

The H2 was proposed concerning the positive impact of self transcendence values have on attitude towards wild/farmed fish consumption. The factor analysis of this study extracted two dimensions of self transcendence value as Universalism and Benevolence. Therefore considering the easy of interpretation, table 4.17 reported H2 (a/b) related to both dimensions of personal values separately as H2a/b (Uni) and H2a/b (Ben). The results of H2a (Uni) revealed the path coefficient of 0.14 ($t = 1.66$; $p=0.096$) between Universalism values and attitude towards wild fish consumption and the path coefficient of -0.09 ($t = -0.96$; $p= 0.383$) between Universalism values and attitude towards farmed fish consumption. Further, H2a (Ben) revealed the path coefficient of 0.16 ($t = 2.02$; $p= 0.043$) between Benevolence values and attitude towards wild fish consumption and the path coefficient of 0.08 ($t = 0.95$; $p= 0.340$) between Benevolence values and attitude towards farmed fish consumption. Even the relationship between Benevolence values and attitude towards wild fish consumption was significantly positive as expected, it was not significant (but positive) in the model explaining farmed fish consumption. Then, the results support H2a (Ben) only for the model explaining wild fish consumption. Based on above results H2b (Ben) also confirmed. Further the relationship between Universalism values and attitude towards wild fish consumption was positive (close to significant), while it was negative in explaining farmed fish consumption. These results lead not to accept the H2a (Uni), and H2b (Uni) also not confirmed from the results of this study.

In general, the results of this study indicated that self transcendence values have positive impact on attitude towards wild fish consumption than that of farmed fish consumption. It explain that the respondents who concern about welfare of those people with whom one is in frequent personal contact (Benevolence) and those who concern about protection of welfare of all people and nature (Universalism), think about the environmental disadvantages of farmed fish and evaluate wild fish is better for environment.

Table 4.17: Results of the structural model for wild/farmed fish and hypotheses tests

Regression path	β & t- value (wild)	β & t- value (farmed)	Hypothesis	Confirmed (Yes/No)
Attitude → intention	0.33 (4.26)**	0.51 (6.95)**	H1a H1b	Yes No
Universalism → Attitude	0.14 (1.66)	-0.09 (-0.96)	H2a (Uni) H2b (Uni)	No
Benevolence → Attitude	0.16 (2.02)*	0.08 (0.95)	H2a (Ben) H2b (Ben)	Yes (for wild) Yes
Universalism → Intention Benevolence → Intention	0.05 (0.55) 0.02 (0.28)	0.02 (0.22) -0.12 (-1.66)	H3a H3b	No No
Universalism → Envt. Concern Benevolence → Envt. Concern	0.31 (3.75)** 0.05 (0.64)	0.32 (3.62)** 0.05 (0.68)	H4a H4b	Yes No
Universalism →Fish welfare Benevolence → Fish welfare	-0.02 (-0.24) 0.08 (1.19)	-0.02 (-0.21) 0.08 (1.17)	H5	No No
Envt. Concern→ Attitude	0.23 (2.39)*	0.14 (1.41)	H6a H6b	Yes (for wild) Yes
Envt. Concern→ Intention	0.003 (0.04)	0.07 (0.80)	H7a H7b	No No
Fish welfare→ Attitude	-0.12 (-1.18)	0.02 (0.21)	H8a H8b	No No
Fish welfare→ Intention	0.08 (0.91)	0.002(0.02)	H9a H9b	No No
Envt. Concern→ Fish welfare	0.59 (8.56)**	0.59 (8.54)**	H10	Yes

***: significant at 1 %; *: significant at 5 %; For wild: R2 (Intention) = 0.13; R2 (Attitude) = 0.10*
For farmed: R2 (Intention) = 0.28; R2 (Attitude) = 0.03

H3 was concerned with the effect of self transcendence values on intention to consume wild/farmed fish. The Universalism values had a path coefficient of 0.05 (t = 0.55; p=0.581), and Benevolence values had a path coefficient of 0.02 (t=0.28; p=0.789) in determining the intention to consume wild fish, revealing a small positive relationship between these values and intention to consume wild fish. The Universalism values had a path coefficient of 0.02 (t = 0.22; p = 0.829), and Benevolence values had a path coefficient of -0.12 (t = -1.66; p=0.096) in their direct relationship with intention to

consume farmed fish. Even there was a positive relationship between intention to consume wild fish and self transcendence values as expected, the effect was small and non significant. Further the results shows that the relationship between Benevolence values and intention to consume farmed fish was negative and higher (non significant), while it is small positive in case of Universalism values. These results leads not to accept the H3a which explaining the significant positive relationship between self transcendence values and intention to consume wild and farmed fish. Even the respondents with these self transcendence values seem to form slightly positive intention towards the wild fish consumption than that of farmed fish, findings not confirm the H3b since the non significant nature of these relationships.

H4 was specified as personal values (self transcendence) have a significant positive impact on Environmental concern of the respondents. Results show that the Universalism values in both models had a significant positive impact on Environmental concern (for wild fish: $\beta 1 = 0.31$, $t = 3.75$, $p<0.0001$; for farmed fish: $\beta 1 = 0.32$, $t = 3.62$, $p<0.0001$) Benevolence values also positively related with environmental concern as expected, but not significant ($\beta 2 = 0.05$, $t = 0.6$ in both models). Therefore for easy of the interpretation the result of the table 4.17 reported the H4 as H4a and H4b. Then the results support only for the H4a, may explain the respondents with stronger emphasis on Universalism values are more likely to have a stronger emphasis on Environmental concern. But the Benevolence values shows a small positive impact on the environmental concern of the consumer, may explain their inability to relate these personal values to the environmental concern in fish. Therefore the H4b was not accepted.

H5 was concerned with the effect of self transcendence values on Fish welfare concern of the consumers. Benevolence values had a positive impact on Fish welfare concern as expected in both models, but the effect was not significant and very small ($\beta=0.08$, $t=1.19$, $p=0.233$ for wild fish; $\beta=0.08$, $t=1.17$, $p=0.240$ for farmed fish). However, the Universalism values has a small negative impact on Fish welfare in both models ($\beta= -0.02$, $t= -0.24$, $p=0.811$ for wild fish; $\beta= -0.02$, $t= -0.21$, $p=0.835$ for farmed fish). This explains that the kind hearted consumers could find slightly positive relationship between

their personal values and fish welfare while the consumers with universalism values did not find such a relationship. Therefore the H5 was not supported by the results of this study.

H6a concern the significant positive impact of Environmental concern on attitude toward wild/farmed fish consumption. The results of H6a revealed the significant positive impact with path coefficient of 0.23 (t =2.39**;** p=0.017) between Environmental concern and attitude towards wild fish consumption and the path coefficient of 0.14 (t = 1.41; p= 0.157) between Environmental concern and attitude towards farmed fish consumption. These results partially support the H6a. The Environmental concern of the consumer leads to make positive attitude about both wild and farmed fish. This may explain their concern about negative environmental impact of farmed fish when forming attitude towards wild fish and negative environmental impact of wild fish when forming attitude towards farmed fish. However it was observed a significant positive impact of Environmental concern on attitude towards wild fish consumption, may explain the consumers higher concern about the bad environmental effects of fish farming than that of wild fish harvesting. These findings also support to the H6b of the study.

Even it was observed a positive path coefficient of 0.003 (t=0.04; p=0.972) between Environmental concern and intention to consume wild fish and positive path coefficient of 0.07 (t= 0.80; p=0.424) between Environmental concern and intention to consume farmed fish, the H7a not accepted since these relationships were very small. It also indicates the consumers' similar view about the impact of Environmental issues in forming an intention to consume wild/farmed fish. H7b also not accepted based on the above findings. However the relationship between the Environmental concern and intention was not strong as the relationship between Environmental concern and attitudes. This is accepted because the value influence the subsequent behavioral intention is not much available (Vaske and Donnelly, 1999).

H8a concern the significant negative impact of Fish welfare concern on attitude toward wild/farmed fish consumption. The results of H8a revealed the path coefficient of -0.12

(t = -1.18; p= 0.241) between Fish welfare concern and attitude towards wild fish consumption and the path coefficient of 0.020 (t = 0.21; p= 0.836) between Fish welfare and attitude towards farmed fish consumption. These results do not support the H8a. But the relation between Fish welfare concern and attitude toward wild fish consumption was negative as expected, may explain the respondents concern about the wild fish welfare issues. Further, the positive relation between Fish welfare concern and attitude toward farmed fish consumption may confirm this by explaining the respondents' positive attitudes towards farmed fish consumption with their welfare concern tend to form negative attitude towards the wild fish consumption. However, the H8b also not accepted since there was no significant effect.

Concerning the significant negative impact on intention to consume wild/farmed fish by the Fish welfare concern of the consumer the H9a has formed, and it also not supported by the results of this study (β=0.08,t=.91,p=.363 for wild fish; β=.002, t=0.02, p=0.985 for farmed fish). However the results show that Fish welfare concern has more positive impact on intention to consume wild fish than that of farmed fish. This results not compatible with the finding in the H8a concerning the attitudes, may explain the consumers difficulties in understanding the relation between welfare issues and intention to consume. On the other hand the less availability of the farmed fish or other reasons that influence on attitude intention relation may affect this incompatibility. But the relation between Fish welfare concern and intention was very low. Finally, the H9b not supported by the results.

The positive and significant path estimate of 0.59 in both models (t=8.56, p<0.001) between Environmental concern and the Fish welfare concern indicates that the consumers who place stronger emphasis on Environmental concern are more likely to have stronger emphasis on Fish welfare concern. These findings support the H10 of the study.

The explained variance for attitudes was R2 = 0.10 and R2 = 0.13 for intention in the wild fish model. But in the farmed fish model the explained variance for the attitudes was

R2 = 0.03 and R2 = 0.28 for intention. This may explain that in both models, the attitudes towards fish consumption has influenced by factors other than the selected ethical values. But in wild fish model, the values could explain 10 % of variance in attitudes towards wild fish consumption while in farmed fish model it explains only 3 % of the variance in attitudes towards the farmed fish consumption. The explained variance of intention to consume wild fish was 13 % and it was 28 % in explaining intention to consume farmed fish. This may explain that the variables other than attitudes also come into consideration here, but the effect of those other variables is high in wild fish model in explaining intention to consume the product.

4.4 Validating the attitude measure

It was observed that the squared multiple correlations of the attitudes in the structural model for farmed fish is very low (R2 = 3 %). It means that the explained variance of the attitude towards consuming farmed fish was only 3 %, which is possible when taken in to account that the model included only ethical and environmental values as predictors. Many other potential factors can influence the attitude towards consumption of wild and farmed fish such as health concern, sensory attributes, availability and price etc. (Kole et al., 2009; Luten et al., 2002). Therefore this study wants to work with an attribute belief models which are usually used to explain attitudes (Olsen, 2004). By doing this, I expected to test the impact of other attributes on attitudes towards wild and farmed fish consumption when compared to the impact of ethical and environmental values.

At the beginning of this chapter, from the exploratory factor analysis, it was observed that the attitudes towards wild and farmed fish consumption can be explained by two latent constructs of attribute beliefs such as quality and availability (naturalness, availability, freshness, and nutritious) and welfare and sustainability (Bad/good for environment, Unethical/Ethical). But the important attributes such as taste, texture and healthiness could not be included for further analysis due to cross loadings. Therefore in the attribute belief model, I intended to adopt items of Bad/good, Dull/exiting and Negative/positive as attitude items to be consistent with attribute used in the model.

4.4.1 Confirmatory factor analysis of attribute's belief model

Initial measurement model of attribute beliefs consisting nine items selected through principle component analysis did not produce good empirical results. Therefore, decided to remove some items that have large residuals. This process led to drop two items from the factor of *quality and availability* (Not fresh/fresh, Unnatural/natural) related to both models.

Table 4.18: Standardized CFA coefficient and reliability of belief constructs (for wild and farmed fish)

Factors/items	**Wild fish**				**Farmed fish**			
	L	**t-value**	**CR**	**VE**	L	**t-value**	**CR**	**VE**
Attitudes			0.69	0.43			0.75	0.51
Bad-Good	0.64	13.51			0.63	13.70		
Dull-Exiting	0.70	14.82			0.72	14.58		
Negative-Positive	0.63	13.34			0.78	14.71		
Quality and Availability			0.50	0.31			0.65	0.50
Not/nutritious	0.65	13.46			0.67	14.07		
Less/Available	0.45	10.78			0.72	14.29		
Welfare & sustainability			0.41	0.30			0.34	0.21
Unethical-ethical	0.54	7.36			0.47	6.68		
Bad/good for envt.	0.48	6.89			0.45	6.40		

For wild fish: $\chi 2 = 29.12$, df = 15, p = 0.016; RMSEA = 0.068; CFI = 0.98; NFI = 0.95; GFI = 0.96, For farmed fish: $\chi 2 = 17.11$, df =11, p = 0.010; RMSEA = 0.052; CFI = 0.99; NFI = 0.97; GFI = 0.97;
Note: *L= Loadings; CR= Composite reliability; VE=Variance extracted*

The final confirmatory model consisted with 2 items for construct of "quality and availability", 2 items for construct of "welfare and sustainability" and three items for the construct of attitude resulted a good fit for the data (For wild fish: $\chi 2$=29.12, df=15, p=0.016; RMSEA=0.068; CFI=.98; NFI=0.95; GFI= 0.96; For farmed fish: $\chi 2$=17.11, df=11, p=0.010; RMSEA=0.052; CFI=0.99; NFI=0.97; GFI= 0.97).

Table 4.18 shows the different measures of reliability computed from the confirmatory factor analysis. Item reliability (factor loadings) and t-values associated with factor loadings were observed ($p<0.01$). However these results do not fully satisfy the criteria for convergent validity in both models (Bagozzi et al., 1991). To examine the construct reliability other two reliability measures of composite reliability and variance extracted

also estimated (Fornell and Larcker, 1981). Even these reliability measures are also not satisfies the recommended levels, it was chose to keep these constructs in the model since the attributes beliefs related to quality/availability and ethics has been shown to have an influence on selection of wild/farmed fish products in earlier studies conducted in other countries (e.g. Verbeke et al., 2007b). And also it has found higher impact of quality and availability attributes on selection of fish in Vietnam (Thom, 2007).

Table 4.19: Correlation of belief constructs in wild and farmed fish (*)

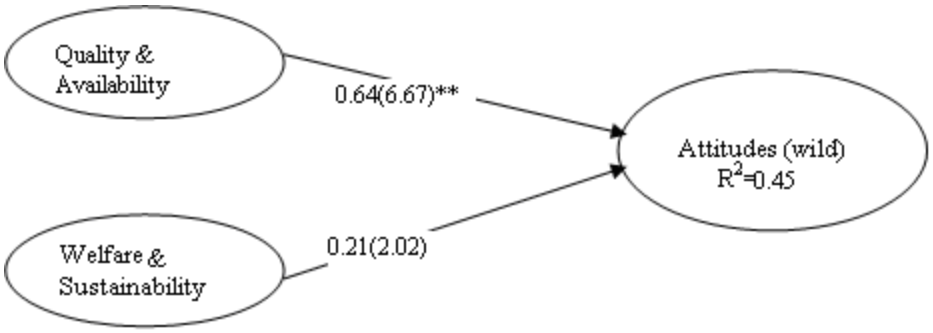
Wild / Farmed	Attitude	Quality & Availability	Welfare & sustainability
Attitude	1	0.63	0.35
Quality & Availability	0.59	1	0.34
Welfare & sustainability	0.39	0.43	1

** all significant at 1% level*

The correlations among constructs used in both models were calculated (see table 4.19). The correlation coefficients are all significant ($p<0.01$). The discriminant analysis was performed by examining the average variance extracted scores of two constructs and the square of the correlation between the same constructs (Fornell and Larcker, 1981). This process result that average variance extracted for pairs of constructs are all greater than square of the correlation between them. Therefore the discriminant validity of the constructs used in the model is confirmed.

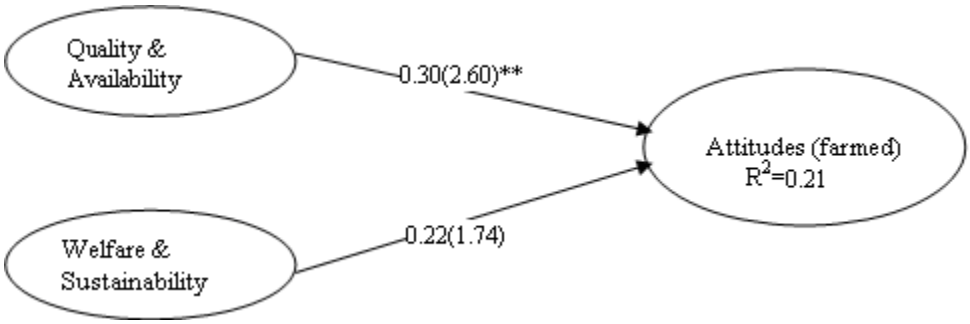
4.4.2. Structural model of attribute beliefs

Structural model for two underlying predictors of attitudes towards wild and farmed fish was estimated (see figure 4.2a and 4.2b). The Goodness of Fit of the structural models was statistically significant. The results of the attribute belief models for wild and farmed fish have presented in table 4.20. The squired multiple correlations (R^2) values for attitudes also presented in the bottom of the table 4.21.



***: significant at 1%*

Figure 4.2a: Standardized regression coefficient of attributes beliefs model for wild fish, t-value in parentheses



***: significant at 1%*

Figure 4.2b: Standardized regression coefficient of attributes belief model for farmed fish, t-value in parentheses

Table 4.20: Goodness-of-fit test for the attributes belief models for wild and farmed fish

Goodness-fit indices	Wild fish; Fig. 4.2a	Farmed fish Fig.4.2b
Chi-square	23.67	17.11
Degrees of freedom	12	11
Probability (P)	0.023	0.010
RMSEA	0.069	0.052
Comparative fit index (CFI)	0.98	0.99
Goodness of fit index (GFI)	0.97	0.98

The results in figure 4.2a and 4.2b show that the attribute beliefs related to Quality and Availability has significant positive impact on attitude toward both wild and farmed fish consumption among the respondents. The regression coefficient of this relation for wild fish was 0.64 (t-value=6.67; $p<0.01$) and for farmed fish 0.30 (t-value=2.60; $p<0.01$). But

beliefs about the Welfare and sustainability do not have significant impact on attitudes towards the wild or farmed fish consumption (see table 4.21).

Table 4.21: Results of the attribute belief model for wild and farmed fish

Regression path	β & t- value (wild)	β & t- value (farmed)
Quality and Availability → Attitude	0.64(6.67)**	0.30(2.60)**
Welfare & sustainability → Attitude	0.21(2.02)	0.22(1.74)

*For wild: R^2 (Attitude) = 0.45; For farmed: R2 (Attitude) = 0.21; **significant at 1 %*

However, the variable of *quality and availability*, together with a somewhat less important *welfare and sustainability* variable, explained 45 % of the variance in attitudes towards wild fish consumption and 21 % in attitudes towards farmed fish consumption. With the knowledge of other important attributes beliefs explaining attitudes towards wild and farmed fish consumption, such as taste, healthiness, freshness and price (Kole et al., 2009) and several demographic variables, the predictive power of these two models are satisfactory. This model is also about belief-attitude consistency, which says that beliefs form attitudes. By considering this with the results of the proposed theoretical model, it can be confirm that welfare and sustainability is not much important for the consumers, while quality and availability aspects are more important in explaining attitudes towards wild and farmed fish consumption. Therefore the measure of attitudes in this study seems to be satisfactory.

5. Discussion

The objectives of this study were to investigate consumers' values and the difference in consumption, attitude and intention to consume wild fish versus farmed fish as well as to explore the relationship between values, attitudes and intention to consume wild fish versus farmed fish in Vietnam. As the conceptual framework to achieve these objectives, the study used Value-Attitudes-Intention/Behavior model (VAB) (Homer and Kahle, 1988). Thus, the proposed model consisted with the constructs of Personal values, Environmental concern for fish and Fish welfare concern as common part of both wild and farmed fish related VAB models. The attitudes towards wild and farmed fish and intention to consume wild and farmed fish were the other constructs in the model which explained the wild versus farmed fish consumption of the consumers. The items used to measure the constructs were either adopted or taken from previous studies. The survey was carried out in Nha Trang, Vietnam and convenience sample of 206 respondents was used. Several analysis methods were used in this study, such as exploratory factor analysis, description analysis, confirmatory factor analysis, and SEM. It was found a high relationship between these value dimensions and attitude towards wild fish consumption as expected, while Benevolence and Environmental concern shows significant positive relationship. However, it was not found such a high relationship between self-transcendence values, Environmental concern and Fish welfare concern of the consumers with attitude towards farmed fish consumption. Further, the study could find a significant relation between attitudes towards wild/farmed fish and intention to consume wild/farmed fish. The following section will explain and discuss these findings.

5.1 Intention and consumption of wild versus farmed fish in Nha Trang

In this study, the intention to consume wild fish and intention to consume farmed fish was measured by four items. The result of reliability test was confirmed (Cronbach's alpha = 0.91 and 0.95 for wild and farmed fish respectively) and selected three items used to estimate the construct of intention in the CFA and SEM. This study found that consumers had significantly high intention to consume wild fish during coming 3 days

than their intention to consume farmed fish. The explained variance of intention to consume wild fish was 13 % and for farmed fish 28 %. It is likely that variable other than attitudes also come into consideration here, like norms, perceived behavioral control and barriers such as price, availability and knowledge (Olsen, 2004). And the effect of these other variables was high on intention to consume wild fish than that of farmed fish. Further, the study found that majority of the consumers consumed fish (in general) three times per week or more. And also the consumers' consumption frequency of wild fish was significantly higher when compared with farmed fish. This result confirms the findings of Honkanen and Olsen (2009) and Verbeke et al. (2007b). The results of this study also indicated that the fish consumption frequency in Vietnam is higher than many European countries (e.g. Spain, Belgium) (Honkanen and Olsen, 2009; Verbeke et al., 2007b). As documented by other studies there is a high positive relationship between intention and behavior (Armitage and Conner, 2001), and this has proven to the fish consumption in Vietnam (Tuu et al., 2008). The findings of this study also seem to be accordance with the above findings and consumers are consistent in their judgment of actual consumption of farmed versus wild fish.

5.2 Consumers' attitudes towards wild and farmed fish consumption

The construct of attitude was described by five items, and the reliability of the items were confirmed (Cronbach's alpha=0.93 for wild and farmed fish). The average mean of the attitude score was significantly high for wild fish (5.4 on a scale from 1 to 7) than that of farmed fish (4.4 on same scale), indicating very positive attitudes toward wild fish among these consumers than attitudes toward farmed fish. The study used three items to estimate the construct of attitude in CFA and SEM. It was found that the attitude towards wild fish and farmed fish of the consumers is significant predictor of the intention to consume particular fish type among the Vietnamese consumers. This finding was accordance with the previous finding in the literature that explained the significant relationship between attitudes and intention to consume fish (Olsen, 2001, 2004; Verbeke and Vackier, 2005; Tuu et al, 2008). However the study found that the attitude towards farmed fish has higher significant positive impact on the intention to consume farmed fish than that of

wild fish. This may be due to intention to consume wild fish is less driven by the attitudes towards wild fish than other factors such as norm and perceived behavioral control. On the other hand intention to consume farmed fish is more driven by the attitudes towards farmed fish than that of wild fish.

The study used 12 items to measure the attributes beliefs that explain the attitudes towards the wild and farmed fish. Exploratory factor analysis extracted two sub constructs as Quality and Availability and Welfare and Sustainability. Although the taste is the most important attribute item in forming attitudes, the results of factor analysis indicated that it's not suitable to describe the construct in this study because very high correlation with general attitude. The mean value of the attribute beliefs related to quality and availability (freshness, nutritious, naturalness, and availability) was significantly higher for the wild fish than that of farmed fish. It means that consumer believe that wild fish is more fresh, nutritious, natural, and available than the farmed fish. These findings are accordance with the finding of the Kole et al. (2009). When consider the sub constructs of Welfare and Sustainability higher per cent of respondents believed that wild fish is slightly good to very good for environment. On the other hand higher per cent of the respondents were believed that farmed fish more unethical than wild fish. However the mean values of the items measure the Welfare and Sustainability indicate that there is no difference between wild and farmed fish in term of these issues.

The explained variance of the attitude towards consuming wild fish is higher (10%) than that of farmed fish (3%). This less per cent of explained variance was resulted due to the model included only ethical and environmental values as predictors of attitudes toward wild and farmed fish consumption. The personal values are also unlikely to account for much of the variability in specific attitudes and behaviors, because they widely shared by all members of the culture (Honkanen et al., 2006; Vaske and Donnelly, 1999). Literature provides evidence that, factors such as health concern, sensory attributes, availability and price etc. act as predictors of attitudes towards wild and farmed fish consumption (Kole et al., 2009; Luten et al., 2002). This study also found that factors such as quality and availability are most important in explaining attitudes than welfare and sustainability

issues. Further it was found that the explained variance of the attitudes were increased up to 45 % and 21 % for wild fish and farmed fish respectively when consider the welfare and sustainability issues together with quality and availability aspects.

5.3 The importance and influence of domain specific values

Environmental concern for food/fish and Food/fish welfare concern are the domain specific value constructs that considered in this study. The construct of Environmental concern for fish was adopted from Environmental concern for food/fish and described by four items. The fish welfare concern was adopted from Food/fish welfare concern and described by three items (all these items measured with a multiple rating list scale ranging from 1 = Not important to 7 = Very important). The constructs of Environmental concern for food and Food welfare concern were adopted for the descriptive study. The reliability of the items were confirmed (Cronbach's alpha for all constructs well above the acceptable level of 0.7). The study used four and three items respectively to estimate Environmental concern for fish and Fish welfare concern in CFA and SEM. Further the consumers' attitude towards food ethics and production also discussed under this level. These items were measured on a 7-point likert scale. Since it acts as a bridge between domain specific values and the specific attitudes towards wild/farmed fish, I start the discussion of domain specific values from attitude towards food ethics and production.

5.3.1 Consumers' attitude towards food ethics and production

In this study five items were selected to describe the consumers' attitude towards food ethics and production. The respondents seems to be ambivalent in their responses to "I don't like to see any of the unethical food products", "Lot of foods I wouldn't buy because of my environmental and ethical concern" and "animal suffer too much on farms" (average mean value of these three items was 4.5), indicate their lack of knowledge or awareness about the ethical problems. But they get angry when think about the way food processors are polluting the environment and willing to stop buying products from companies guilty of polluting the environment (average mean value of the

two items was 5.2 on the same scale). This confirms the finding of negative information related to the food production method influence consumer attitude more than the influence of positive information, and may leads to boycott the products produced through unethical production methods (Herr et al., 1991). The results of this study indicated that consumers' attitudes towards the production methods are also important and this may influence to formation of attitudes towards specific product (wild versus farmed fish in this study) (Bredahl, 2001).

5.3.2 Environmental concern for food and food welfare

The consumers have perceived that the Environmental issues related to food are important to them than the food welfare issues. The average mean value of the Environmental concern for food was high (5.2) than Food welfare (4.8), indicating the significantly high importance of the Environmental concern related to food for the consumers. These constructs were used in the study to understand the general pattern of the Environmental and welfare concern of the consumers related to food they consume. These findings related to Vietnamese consumers are contradict with the finding of the Frewer et al. (2005), who reported that food welfare issues more important than environmental issues in food sector to the Dutch consumers.

5.3.3 Environmental concern for fish and fish welfare concern

The average mean value of the Environmental concern for fish (5.3) was significantly higher than the average mean value of Fish welfare concern (4.1), indicate the consumers importance of the Environmental concern related to fish than that of fish welfare concern. This finding is accordance with the finding of Honkanen and Olsen (2009) for the consumers in Valencia, Spain.

Environmental concern for wild fish had strong and significant positive impact on attitude toward wild fish consumption (0.23), indicating the important role of environmental concern in forming attitudes towards the consumption of wild fish among

Vietnamese. On the other hand environmental concerns for farmed fish also indicated a higher positive impact (0.14) on attitude toward farmed fish consumption, but this was not significant. This means that consumers think about the environmental disadvantages of fish farming than those related to wild fish harvesting when forming positive attitudes towards wild/farmed fish. This finding can be explained from the finding of consumers concern about issues like pollution from untreated effluents and problem of escapees in fish farming (Read and Fernandez, 2003; Kaiser, 1997; Cotter et al., 2000). And also consumer think about the environmental disadvantages like overexploitation of fish stocks (Hentrich and Salomon, 2006) when forming positive attitudes towards farmed fish. But they have perceived the significantly high negative environmental impact of fish farming, which leads to form higher positive attitude towards wild fish consumption.

The study did not found relationship between Environmental concern and intention to consume wild fish. However, positive relationship found between environmental concern and intention to consume farmed fish, but the effect was negligible. The previous studies also have reported that value influence the subsequent behavioral intention is weak (Vaske and Donnelly, 1999).

As expected, Fish welfare concern had a higher negative impact on attitude toward wild fish consumption, but the effect was not significant. This explain that consumer worry about the pain, fear and stressful feeling to the fish at wild fish harvesting (Cooke and Sneddon, 2007; Tinarwo, 2006). Further, the small positive relationship between Fish welfare concern and attitude toward farmed fish indicate that consumer do not feel the farmed fish as an animal. Fish welfare concern also had negligible impact on intention to consume wild or farmed fish.

It was found a significant positive relationship between Environmental concern and the Fish welfare concern. It explains that the consumers, who found much importance in Environmental concern, are more likely to have stronger emphasis on Fish welfare concern. This is because the consumers perceived that animal/fish as a part of the natural

environment, therefore those who concern about environmental sustainability issues may also concern about fish welfare (Vermeir and Verbeke, 2008).

5.4 The importance and influence of personal values

In this study, the Universalism values of the consumer were measured by nine items. Exploratory factor analysis indicated that two items were suitable for further analysis. The result of reliability test was confirmed (Cronbach's alpha=0.76) and these two items used to estimate the construct of Universalism values in the CFA and SEM. The average mean of the construct (5.5 on a scale from 1 to 7), indicating Universalism values were quite important to the consumers. However it was found that the Universalism values have a non significant, but higher positive impact on attitude toward wild fish consumption and very small negative impact on attitude towards farmed fish consumption. The more positive impact were to form attitude towards wild fish consumption, may explain the consumers consideration of the negative ethical and environmental impacts of the fish farming than that of wild fish harvesting. The relationship between the Universalism values and the intention to consume wild and farmed fish were also positive, but very small. However, the small relationship between the universalism values and attitudes towards the behavior confirm the findings of Raaij and Verhallen (1993). They found that the general personal values will not provide a better explanation for specific behavior as domain specific values.

The Benevolence values of the consumer were measured with eight items and first factor analysis explored six items (Cronbach's alpha=0.87) and only three items used to estimate the construct in the CFA and SEM. The average mean of the Benevolence values (6.0 on a scale from 1 to 7), indicated that these values were very important to the consumers. Further it was found that the Benevolence values have a significant positive relationship with the attitudes towards the wild fish consumption as expected and very small positive relationship with the attitudes towards the farmed fish consumption. This explains that the strong Benevolence consumers are more concerned about the ethical and environmental disadvantages of the fish farming than that of wild fish harvesting. This

may be due to the high benevolence consumers consider the social norms from others as their own beliefs to motivate sustainable behavior (Vermeir and Verbeke, 2008). The non significant but high negative relationship between Benevolence values and intention to consume farmed fish further explain these consumer perceptions about the environmental and ethical disadvantages of fish farming.

As expected, there was a significant positive relationship between consumers' Universalism values and the Environmental concern. It explains that consumers with stronger emphasis on Universalism values are more likely to have a stronger emphasis on Environmental concern. This finding is accordance with the finding of Vaske and Donnelly (1999). They mentioned that influence of personal values on attitudes and behavior occurs indirectly via domain specific values and those domain specific values helps to strengthen and give meaning to personal values. How ever, the relationship between the Benevolence values and the Environmental concern was negligible, may be due to these consumers could not found direct relationship between their Benevolence values and the Environmental concern.

Further small positive relationship was observed between Benevolence values and Fish welfare concern, explaining the Fish welfare issues were somewhat important to the kind hearted consumers. However the Universalism values had negligible impact on the consumers Fish welfare concern.

5.5 The Value-attitude-intention/behavior model

The findings of this research have shown that personal values (Universalism, Benevolence) associated with the domain specific value (Environmental concern, Fish welfare concern) and those personal and domain specific values were highly associated to attitude toward wild fish consumption (Benevolence and Environmental concern has significant positive impact). The resulting attitude (attitude towards wild fish), in turn, had a direct influence on intention to consume wild fish. This research shows that all the personal values and domain specific values only have an indirect effect on intention to

consume wild fish through attitude and domain specific values. Concerning farmed fish, even significant relationship between attitude and intention was found, it was not observed such a relationship between values and attitude. This suggests that attitude towards wild fish had a mediating role in the values-attitude-intention/behaviour model. This causal flow of values-attitude-intention/behaviour in wild fish consumption accordance with researches found in the literature that argue the influence flows from abstract value to mid-range attitudes and to specific behaviours, and that values have only an indirect effect on consumer intention/behaviour through domain-specific attitudes (Homer and Kahle, 1988; Jayawardhena, 2004; Shim and Eastlick, 1998). These findings partially confirm that value-attitude-behaviour (VAB) hierarchy model related to wild fish consumption among Vietnamese. It should be noted that the "partially" confirmed the VAB model because this study used intention instead of actual behaviour. Further the model has been confirmed for only one product (wild fish) but not for the other (farmed), and this also can be remarked as "partially" confirmed.

This study also shows the mediating role of the domain specific values in explaining the relationship between personal values and specific attitudes. For example, Universalism values had a significant positive relationship with Environmental concern of the consumer. Environmental concern had a significant positive relationship with attitudes towards wild fish consumption. Further, the Universalism values had a non significant relationship with the attitudes towards wild fish consumption. With reference to the figure 2.2 depicted in theoretical discussion of this study, the influence of personal values on attitudes and behavior occurs indirectly via domain specific values (Vinson et al., 1977; Raaij and Verhallen, 1993; Vaske and Donnelly, 1999; Honkanen et al., 2006). In this study the Environmental concern as a domain specific values serve to strengthen and give meaning to Universalism values (global values). As discussed earlier in this study, since the personal values are widely shared by all members of the culture, it fails to provide much of the variability in specific attitudes and behaviors. Thus, this study also proves the mediating role of the domain specific values.

5.6 Practical implications

This study has shown that the environment and welfare concern of the consumer together with related personal values are less likely to form attitudes and intentions to consume wild and farmed fish. However, the influence of these values on wild fish consumption seems to be higher than farmed fish consumption. Therefore these consumers act as a natural target for marketers of wild fish products.

The results suggest that marketers of wild fish products can be appeal to two levels in the belief hierarchy in their communications. The first level is the environmental and welfare concern as well as the personal values of the consumers. The second is the attitude level which based on attributes beliefs towards the wild fish products. However, marketers in the area of farmed fish, the demand for their farmed fish products may be enhanced mostly by appealing to the attitudinal beliefs based on the attributes (quality, availability) of farmed fish products rather than appealing to the consumers' ethical beliefs or values. And also the study found that fish welfare concern has negative impact on attitudes towards wild fish consumption. This may be important finding for the farmed fish marketers, which not affected by ethical reasoning. Further, the consumers beliefs towards the farmed fish in terms of freshness, nutritious, naturalness and the availability is not much favorable, may be due to lack of knowledge regarding the fish farming and quality issues. The farmed fish marketers may need some effort to increase the consumers' knowledge about their products and production method. Since the consumers are found to have concern about the method of food production, favorable or unfavorable attitudes may influence by attitude towards production methods as well.

Personal values, which measured in this study, were more important to the consumers. But these personal values did not found much impact on farmed or wild fish consumption. However, if personal values can be activated and related to wild/farmed fish consumption decisions, the marketers may able to get advantages (Honkanen et al, 2006). Because there may be consumers who are environmentally interested, but not found any relationship between their personal values and environmental concern related

to fish consumption. Further, it was accepted that the personal values located in the deeper of the belief hierarchy and hence are more stable (Dreezens et al., 2005), if activated can be enhance the likelihood of choosing particular fish products. However some about this issue seems to be not much important compared to other antecedents of fish consumption behavior in less developing countries compared to countries like Germany, UK and Denmark.

5.7 Limitations and future research

This study provides an insight into relationships among values, attitudes and intention to consume wild versus farmed fish in Vietnam. Several limitations of this study should be considered when interpreting the results and developing future research to extend and expand its scope.

One of the primary limitations of the study associated with the lack of secondary data from similar studies in Asian countries. As a consequence the major source of this type of secondary information was gathered from studies conducted in the European countries.

Another limitation pertains to the sample size and sampling method. Primary data had to collect from a convenience sample of consumers in Nha Trang, Vietnam. Sample is relatively small and they are not statistically representative to the total population in Nha Trang or Vietnam. Therefore the results could not be generalized to Vietnam, and have to be interpreted within the characteristics of the samples used. In order to get real understanding about the wild versus farmed fish consumption behavior, attitudes, intention, and their causal relation with values, future studies should consider a more representative sample of consumers in Vietnam.

It is also important to note that the findings from this study did not result from direct questioning, e.g., the study did not directly probe about reasons for welfare concern (health reason or real ethical view) related to food/fish consumption. This brings the disadvantage of not proving any causality, only association. Future studies can prevent

this by focus group discussion or interviewing the respondents. Then the marketer can gain the real picture about the consumers.

The future studies should apply the value-attitude-behavior framework in a comparative examination of different types of wild and farmed fish products, which not practiced in this study. It is because the consumers' view may be different according to the type of seafood products (e.g. wild versus farmed shrimp).

In the future, consumers need to be more and better informed about farmed fish and wild fish. It will help to get better responses about the expected issues and prevent the difficulties arise due to their lack of knowledge.

Finally, it should be noted that this study used VAI-model for patrimonial reasons, and that self reported behaviour of consumption of wild versus farmed is questionable. For future research, it could be studied with "actual behaviour", but it will incur high cost.

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Appendix 1 Measurement of constructs

Appendix 1.1 Personal values

We would like you to describe your personal values; what is important in your life. We have selected several questions covering different aspect of your life. We would like you to assess questions carefully and tick off the value that best describes what is not important and important for you personally. For example, if you feel not important, tick off the box ☒ under 1. If you feel very important, tick off the box under 7, or somewhere in between if you have another perception. Some items are quite similar, but it is entirely up to you to what extent you choose to give the same assessment or not. What we do want, however, is that you mark only one box on each line you feel you can answer. (Mark one box ☒ per line)

	Not important						Very important
	1	2	3	4	5	6	7
Unity with nature (fitting into nature)	☐	☐	☐	☐	☐	☐	☐
Protecting the environment (preserving nature)	☐	☐	☐	☐	☐	☐	☐
Equality (equal opportunity for all)	☐	☐	☐	☐	☐	☐	☐
Social justice (correcting injustice, care for the weak)	☐	☐	☐	☐	☐	☐	☐
Meaning in life (a purpose in life)	☐	☐	☐	☐	☐	☐	☐
A world of beauty (beauty of nature and the arts)	☐	☐	☐	☐	☐	☐	☐
Broad minded (tolerant of different ideas and beliefs)	☐	☐	☐	☐	☐	☐	☐
Inner harmony (peace with myself)	☐	☐	☐	☐	☐	☐	☐
A world at peace (free of war and conflict)	☐	☐	☐	☐	☐	☐	☐
Forgiving (willing to pardon others)	☐	☐	☐	☐	☐	☐	☐
Helpful (working for the welfare of others)	☐	☐	☐	☐	☐	☐	☐
Honest (genuine, sincere)	☐	☐	☐	☐	☐	☐	☐
Loyal (faithful to my friends, group)	☐	☐	☐	☐	☐	☐	☐
Mature Love (spiritual intimacy)	☐	☐	☐	☐	☐	☐	☐
Wisdom (a mature understanding of life)	☐	☐	☐	☐	☐	☐	☐
True Friendship (companionship)	☐	☐	☐	☐	☐	☐	☐
Responsible (dependable & reliable)	☐	☐	☐	☐	☐	☐	☐

Appendix 1.2 Domain specific values

Appendix 1.2.1 Food ethics and production

Now, we will make some assertions about food ethics and production. For each assertion, we want you to state how much you disagree or agree. If, for example, you strongly disagree, tick off the box ☒ under 1. If you strongly agree, tick off the box under 7, or somewhere in between if you have another perception. Please read each questions carefully so that you understand the valence of the assertion. Some assertions are quite similar, but it is entirely up to you to what extent you choose to give the same assessment or not. What we do want, however, is that you mark only one box on each line you feel you can answer.

Items	Strongly disagree			Neither agree nor disagree			Strongly agree
	1	2	3	4	5	6	7
I have no ethical and environmental concern about eating food	☐	☐	☐	☐	☐	☐	☐
I don't like to see any of the unethical food products	☐	☐	☐	☐	☐	☐	☐
There are a lot of foods I wouldn't buy because of my ethical concern	☐	☐	☐	☐	☐	☐	☐
When I think about the way food processors and industries are polluting I get very angry	☐	☐	☐	☐	☐	☐	☐
I would be willing to stop buying products from companies guilty of polluting the environment"	☐	☐	☐	☐	☐	☐	☐
Animals suffer too much stress on farms	☐	☐	☐	☐	☐	☐	☐

Appendix 1.2.2 Environmental concern for food

Then we will make some assertions about Environmental concern for food. For each assertion, we want you to state how much importance these to you. For example, if you feel not important, tick off the box ☒ under 1. If you feel very important, tick off the box under 7, or somewhere in between if you have another perception. Please read each question carefully, some assertions are quite similar, but it is entirely up to you to what extent you choose to give the same assessment or not. What we do want, however, is that you mark only one box on each line you feel you can answer.

"It is important to me that the food I eat on a typical day ..."

	Not Important						Very Important
	1	2	3	4	5	6	7
Has been produced in an environmentally friendly way	☐	☐	☐	☐	☐	☐	☐
Has been produced in a way which has not shaken the balance of nature	☐	☐	☐	☐	☐	☐	☐
Is produced without negative consequences for envt. & nature	☐	☐	☐	☐	☐	☐	☐

Appendix 1.2.3 Animal Welfare concern for food

Now we will make some assertions about Animal Welfare concern for food. For each assertion, we want you to state how much importance these to you. Mark one box ☒ per line.

"It is important to me that the food I eat on a typical day ..."

	Not Important 1	2	3	4	5	6	Very Important 7
Has been produced in a way that animals have not experienced pain	☐	☐	☐	☐	☐	☐	☐
Has been produced in a way that animals' rights have been respected	☐	☐	☐	☐	☐	☐	☐
Has been produced in an animal friendly way	☐	☐	☐	☐	☐	☐	☐

Appendix 1.2.4 Environmental concern for fish

We will make some assertions about Environmental concern for fish. For each assertion, we want you to state how much importance these to you. Mark one box ☒ per line.

"It is important to me that the fish I eat on a typical day ..."

	Not Important 1	2	3	4	5	6	Very Important 7
Has been produced in a way which has not polluted the sea or the other environments	☐	☐	☐	☐	☐	☐	☐
Has been produced in an environmentally friendly way	☐	☐	☐	☐	☐	☐	☐
Is not threatened by over-fishing & loss species on the border of extinction	☐	☐	☐	☐	☐	☐	☐
Is produced without negative consequences for the environment	☐	☐	☐	☐	☐	☐	☐

Appendix 1.2.5 Fish Welfare concern

We will make some assertions about Fish Welfare concern. For each assertion, we want you to state how much importance these to you. Mark one box ☒ per line.

"It is important to me that the fish I eat on a typical day ..."

	Not Important 1	2	3	4	5	6	Very Important 7
Has been caught and produced with respect for their rights and wellbeing	☐	☐	☐	☐	☐	☐	☐
Has been caught & produced without Suffering	☐	☐	☐	☐	☐	☐	☐
Has been caught and produced in a friendly way	☐	☐	☐	☐	☐	☐	☐

Appendix 1.3 General attitude and attribute beliefs

In the following we would like you to think about how you feel when you eat wild/farmed fish as a meal. Please indicate for each row which word best describes your feeling. (Mark one box ☒ per line)

When I eat wild/farmed fish, I feel…..

	1	2	3	4	5	6	7	
Bad	☐	☐	☐	☐	☐	☐	☐	Good
Unsatisfied	☐	☐	☐	☐	☐	☐	☐	Satisfied
Unpleasant	☐	☐	☐	☐	☐	☐	☐	Pleasant
Dull	☐	☐	☐	☐	☐	☐	☐	Exiting
Negative	☐	☐	☐	☐	☐	☐	☐	Positive

Appendix 1.3.1 Attribute beliefs

How would you evaluate wild/farmed fish as a meal along the following different attributes? The evaluation is from very bad (1) to very good (7). (Mark one box ☒ per line)

	1	2	3	4	5	6	7	
Bad taste	☐	☐	☐	☐	☐	☐	☐	Good taste
Bad texture	☐	☐	☐	☐	☐	☐	☐	Good texture
Badappearance	☐	☐	☐	☐	☐	☐	☐	Good appearance
Unhealthy	☐	☐	☐	☐	☐	☐	☐	Healthy
Not nutritious	☐	☐	☐	☐	☐	☐	☐	Nutritious
Expensive	☐	☐	☐	☐	☐	☐	☐	Cheap
Less available	☐	☐	☐	☐	☐	☐	☐	More available
Not fresh	☐	☐	☐	☐	☐	☐	☐	Very fresh
Unnatural	☐	☐	☐	☐	☐	☐	☐	Natural
Bad smell	☐	☐	☐	☐	☐	☐	☐	Good smell
Unethical	☐	☐	☐	☐	☐	☐	☐	Ethical
Bad for evnt.	☐	☐	☐	☐	☐	☐	☐	Good for evnt.

Appendix 1.4 Intention to consume

For some, expectations, planning and desires mean the same thing. For others, there is a difference between the terms. Could you please estimate how many times during the 3 coming days you plan, expect, want to and desire to buy or eat wild fish/ farmed fish as a meal – including today? (One cross ☒ per line)

During the 3 coming days	Very unlikely			Neutral estimation			Very likely
	1	2	3	4	5	6	7
I plan to eat	☐	☐	☐	☐	☐	☐	☐
I expect to eat	☐	☐	☐	☐	☐	☐	☐
I want to eat	☐	☐	☐	☐	☐	☐	☐
I desire to eat	☐	☐	☐	☐	☐	☐	☐

Appendix 1.5 Fish consumption frequency

Below, we would like you to present types of fish that you consume on your meals. Please make a ☒ for each alternatives that best describes how many times on average during the last year you have consumed the following type of fish on your meal. If none of the response alternatives completely covers your situation, tick off for the alternative that is closest. Please mark only one answer in each row.

	Less or never	1-2 times a year	2-5 times every 6 months	1-3 times per month	Once a week	Twice a week	3 times Per Week	4 times Per week or more	5 times Per week
"Consumption of…"	1	2	3	4	5	6	7	8	9
Fish in general	□	□	□	□	□	□	□	□	□
Wild fish	□	□	□	□	□	□	□	□	□
Farmed fish	□	□	□	□	□	□	□	□	□

Appendix 2: Rotated Component Matrix of personal values, domain specific values and attitudes towards food ethics and production

Items	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Unity with nature						**.769**		
Protecting the environment						**.826**		
Equality							.696	
Social justice			.362			.498	.375	
Meaning in life			.346		.452	.456		
A world of beauty					.612			-.322
Broad minded			.408		.666			
Inner harmony					.757			
A world at peace							.381	
Forgiving			**.772**					
Helpful			**.796**					
Honest			**.786**					
Loyal			**.728**					
Mature Love			.512		.411			
Wisdom			.550		.359			
True Friendship			**.725**					
Responsible			**.666**		.382			
Environmentally friendly food		**.777**						
Not shaken the balance nature food		**.825**						
Without negative envt consequences food	.304	**.787**						
Animals not experienced pain food	**.850**							
Animals' rights respected food	**.850**	.333						
Animal friendly way food	**.851**							
Not polluted the sea/other envt	.321	**.777**						
Environmentally-friendly way	.373	**.778**						
Not threatened by over-fishing/extinction		**.798**						
Without negative consequences envt.		**.811**						
Respect for fish rights and wellbeing	**.878**							
Produced without suffering	**.906**							
Caught/produced in a friendly way	**.864**							
No ethical, envt. concern eating food								.599
Don’t like to see unethical food				**.610**				
Lot of foods I wouldn’t buy...				**.649**				
When I think way food processors polluting				**.776**				
I'm willing to stop buying products from..				**.729**				
Animals suffer too much stress on farms				**.635**				

1 = Food/fish welfare, 2 = Environmental concern for food/fish, 3 = Benevolence, 4 = Attitudes towards food ethics and production, 6 = Universalism

Appendix 3: Rotated Component Matrix of attitudes, intention and attribute beliefs related to wild fish

Items	**1**	**2**	**3**	**4**	**5**
Bad/Good	**.832**				
Unsatisfied/Satisfied	**.867**				
Unpleasant/pleasant	**.874**				
Dull/Exiting	**.846**				
Negative/Positive	**.749**				
Bad/good taste	.660	.359			
Bad/good texture	.531	.562			
Bad/good appearance	.503	.390			
Un/healthy	.481	.627			
Not/nutritious	.311	**.724**			
Expensive/cheap					.860
Less/available		**.724**			
Not/fresh		**.710**			.338
Un/natural		**.725**			
Bad/good smell				.513	
Un/ethical				**.800**	
Bad/good for environment				**.804**	
I plan to eat			**.814**		
I expect to eat			**.868**		
I want to eat			**.907**		
I desire to eat			**.864**		

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization, ***Note****:* 1 = Attitudes towards wild fish, 2 = Quality and availability, 3 = Intention to consume wild fish, 4 = Welfare and sustainability

Appendix 4: Rotated Component Matrix of attitudes, intention and attribute beliefs related to farmed fish

Items	**1**	**2**	**3**	**4**
Bad/Good		**.830**		
Unsatisfied/Satisfied		**.832**		
Unpleasant/pleasant	.304	**.815**		
Dull/Exiting		**.817**		
Negative/Positive		**.799**		
Bad/good taste	.647	.426		
Bad/good texture	.815	.307		
Bad/good appearance	.634			
Un/healthy	.818			
Not/nutritious	**.817**			
Expensive/cheap		.333		.320
Less/available	**.737**			
Not/fresh	**.634**			
Un/natural	**.789**			
Bad/good smell	.681			
Un/ethical				**.776**
Bad/good for environment				**.790**
I plan to eat			**.874**	
I expect to eat			**.904**	
I want to eat			**.907**	
I desire to eat			**.885**	

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization
1 = Quality and availability, 2 = Attitudes towards farmed fish, 3 = Intention to consume farmed fish
4 = Welfare and sustainability