

Assessing vulnerability in households and communities involved in fisheries sector activities

MA thesis in Globalization and International Development

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Abstract

Global fisheries are in decline in response to intense pressure to feed a growing world population. Many of the world's fisherpeople live in poverty and suffer disproportionately from this threat to global fish stocks due to competition for resources among other stressors. In recent years the Vietnamese government has encouraged small-scale aquaculture production for economic development and to mitigate declining fisheries livelihoods. Using data from the 2013 Vietnam Transitions Survey this paper examines different measures of household vulnerability to the declining fishery and the resulting uncertain economic future. Analysis reveals that the most vulnerable group among survey participants are those who depend primarily on extensive aquaculture for their household income. Despite the frequency of disease in fish, intensive aquaculture remains an attractive livelihood activity. Households are theoretically willing to face increased risk in exchange for greater prosperity, but are typically unable to do so due to cost-related barriers to entry.

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Introduction

Fisheries the world over are in decline in response to intense pressure to feed a growing world population in need of protein and micronutrient sources (Watson et al., 2013). The Food and Agriculture Association, which monitors global catch data, reports that most of the world's fishing areas have reached their maximum potential for capture fisheries production, and that the majority of stocks have already been fully exploited (FAO 2012).

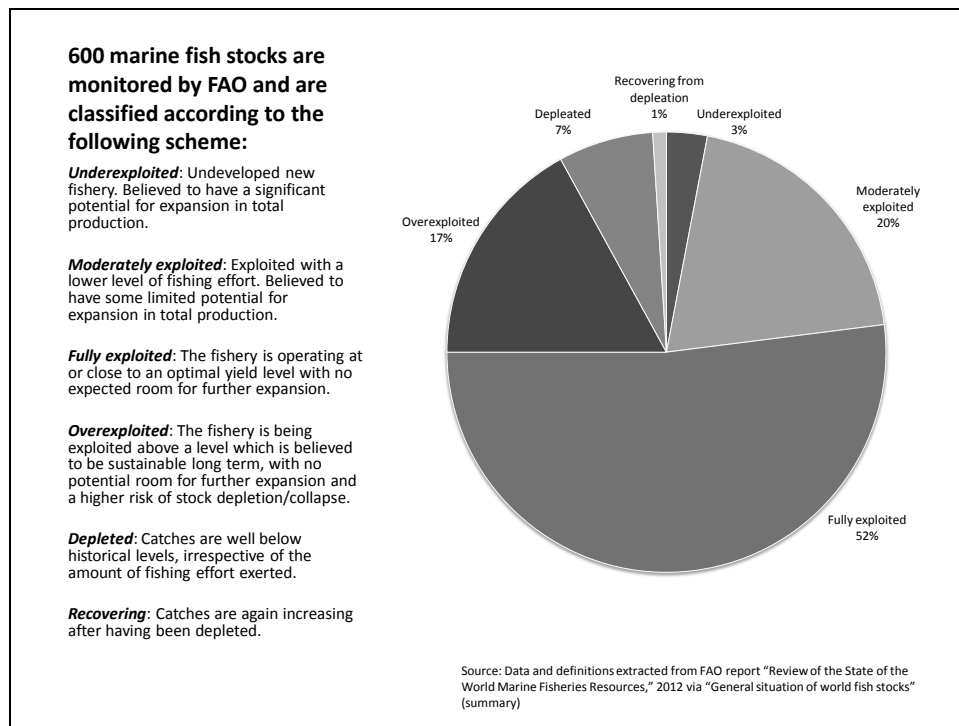


Figure 1 Depletion of global marine fish stocks by level of exploitation, 2011.

Many of the world's fisherpeople live in poverty and suffer disproportionately from this threat to global fish stocks due to competition for resources, capture of the same by elites, declining household income resulting from smaller catches or increased fishing effort, inaccessibility of livelihood alternatives, and food insecurity (Béné, 2009). As global demand for food fish and seafood increases, there will likely be no respite from these pressures.

In the world's coastal areas people have traditionally relied on both fishing and aquaculture as major contributors to their household's livelihood portfolio. While aquaculture¹ is frequently cited as an

¹ The FAO defines aquaculture thusly: "Aquaculture is the farming of aquatic organisms, including fish, molluscs, crustaceans and aquatic plants. Farming implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc. Farming also implies individual or corporate ownership of the stock being cultivated. For statistical purposes, aquatic organisms which are harvested by an individual or corporate body which has owned them throughout their rearing period contribute to aquaculture, while aquatic organisms which are exploitable by the public as a common property resources, with or without appropriate licences, are the harvest of fisheries." Source:

as yet unexploited solution to food insecurity and economic development in less developed countries, there is little concrete evidence of a reduction in the vulnerability experienced by poor fishers in those countries where aquaculture exports have grown (Belton & Thilstead, 2013). For aquaculture to have such an impact, the majority of countries would require a substantial investment or injection of capital for infrastructure, extension services, monitoring, and enforcement of regulation in order to ensure equality of access to resources (Belton & Thilstead, 2013). The success of such an intervention would also be limited by the availability and accessibility of resources such as land and water as well as financing options.

In 2009, Vietnam ranked as the fourth largest exporter of fish and fish products in terms of trade value surpassed only by China, Norway and Thailand (FishstatJ, 2013). More than 550,000 people living in Vietnam's coastal districts are full-time fishers which accounts for approximately 93% of fishers in the country, and this figure is increasing at a rate of 25,000 people per year (Pomeroy et al., 2009). World Bank estimates put this figure at greater than 2 million when aquaculture, and upstream/downstream services are included (World Bank, 2005). In recent years the Vietnamese government has encouraged an increase in small-scale aquaculture production for economic development and as a way to mitigate declining fisheries livelihoods in the face of an ever more industrialized fisheries sector (Marschke and Betcherman, draft paper ; Pomeroy, 2009; Bianchi & Fletcher, 2011). In fact, as seen in Figure 1, aquaculture production now surpasses fish captures in Vietnam.

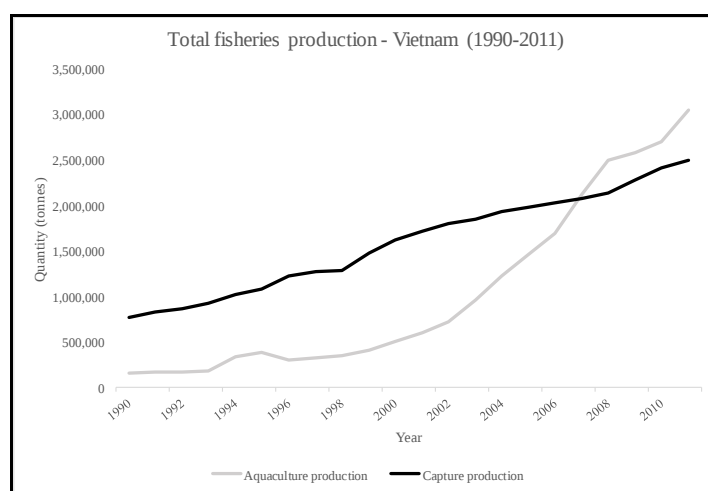


Figure 2 Total fisheries production in Vietnam - fishing and aquaculture, 1990-2011. Source: FishStatJ, 2014.

With more than 5% of Vietnamese households engaged in fishing as a main livelihood strategy (Pomeroy et al., 2009), not to mention those households engaged in aquaculture, Vietnam is an excellent candidate for analysis of the dynamics of household fishing and aquaculture production.

Using data from the 2013 Vietnam Transitions Survey² this paper will examines different

<http://www.fao.org/docrep/003/X6941E/x6941e04.htm>

² This survey (n=599), designed and implemented by two University of Ottawa Professors, examined fisheries transitions in Vietnam. It was based loosely on Vietnam's Living Standards Measurement Survey (VLSMS), and fisheries modules recently piloted in Uganda and Malawi by Worldfish (c.f. Bene et al. 2010, 2012). The survey questionnaire included nine modules: household information; employment and earnings; other sources of income; fishing; aquaculture; assets and housing; loans; risks

measures of household vulnerability to the shock of a declining fishery and a resulting uncertain economic future. Note that the terms fishery, fisheries and fisheries sector activities refer both fishing and fish farming (or aquaculture). By examining the role of the livelihood portfolio in household level vulnerability, this paper seeks to answer the following research questions:

- i. What are the common characteristics of households in coastal Vietnam who are fishing or farming fish as part of a livelihood strategy?
- ii. How vulnerable are small-scale fishers and aquaculture producers in Vietnam to shocks?
- iii. How do different approaches to assessment enhance our understanding of household level vulnerability?

Vulnerability is assessed by three methods, first using a vulnerability index developed by Béné (2009); second through basic poverty analysis measures including the poverty headcount ratio and the poverty gap; and third by analyzing the VTS survey responses of households with varying livelihood portfolios and geographical situations on shocks, coping and perception of risk. Vulnerability as a conceptual framework has been under-applied at the household and community level, particularly in coastal communities, which is an unfortunate oversight given the flexibility of the tool to adapt to a variety of site-specific conditions (McClanahan et al., 2013). A cohesive vulnerability analysis can inform policy and planning of development programming and help to manage conflict over resources. Identifying contributing factors to vulnerability, and understanding the potential and applicability of policy interventions can improve community resilience as well as the health and well-being of its individual members.

Literature review

Fisheries in the world

Fish stocks the world over are generally acknowledged to be in decline with an estimated 80% of 523 world fish stocks reported as fully or over exploited (Muir, 2013). The ecological implications of such a shift in species composition and diversity have yet to be fully understood. There is a pattern of industrialization in food production affecting both more and less developed countries which has deeply affected the frequency, locations and methods used in fishing. While many people continue to fish using traditional (low-tech) gear in traditional locations, a substantial decrease in fish stocks forces fishers to upgrade their gear and fishing vessels and seek new locations and species to fish in order to maintain their catch volumes (Pauly et al., 1998) or to exit the sector entirely. While the decline in fish stocks is primarily attributable to industrial fishing fleets expanding catch areas into increasingly deeper waters and using highly effective and non-selective fishing methods and gear such as trawling and gillnets, small scale fisher people are also increasing their efforts to shore up dwindling fishing incomes and to compensate for decreasing fish resources (Béné, 2009). There is a complex interplay of supply and demand between developed countries where fishing is principally industrialized and less developed countries where fishing at the small scale as well as the industrial scale may play a role:

A sizeable share of fish consumed in developed countries consists of imports, and, owing to steady demand and declining domestic fishery production (down 10 percent in the period 2000-2010), their dependence on imports, in particular from developing countries, is projected to grow in the coming years (FAO, 2012).

Fishing is not only affecting overall quantity of fish available, but the type of fish captured effects the species composition of the food web which has profound implications for ecosystem biodiversity, integrity and longevity (Pauly et al., 1998). Industrialized fishing has targeted high value, long-lived piscivorous bottom fish to such an extent that the exhaustion of these stocks can be detected in a consequent increase in landings of smaller invertebrates and planktivorous fishes (Pauly et al., 1998). The effects of this phenomenon, fishing down the food web, are exacerbated by unselective fishing methods such as dredging which result in large amounts of by-catch and or trash fish being caught, and by the increasing demand for fishmeal for the production of fish feed in aquaculture. In fact, nearly 63% of fishmeal and 81% of fish oil was used in aquaculture feed in 2009 (Natale et al., 2013).

Over the course of the last twenty years aquaculture has come to represent nearly half of the world's fish production. Presently, industrialized aquaculture exists alongside small scale aquaculture and both play a major role in economic development of both more and less developed countries. Small scale aquaculture is often touted as a method of livelihood portfolio diversification, income generation and nutritional enhancement for people living in poverty in developing countries (Barrett, 2010; Chappell & Lavalley, 2011; Godfray et al., 2010). There are however numerous sustainability concerns which counterbalance these potential benefits as reviewed in Tacon et al., 2010.

Table 1 Potential negative impacts of the aquaculture sector and the associated implications for ecological and socio-economic sustainability, adapted from Tacon et al. 2010.

<i>Potential negative impacts of the aquaculture sector</i>	<i>Sustainability implications</i>
<i>Mangrove destruction and habitat loss</i>	Ecological destruction affecting multiple species and habitats which in turn affects the ability for people to make their livelihoods from various mangrove resources.
<i>Pollution and degradation of the aquatic and benthic environment.</i>	Toxins bioaccumulate in fatty tissues of aquatic species as they are consumed by other organisms (including humans). The benthic environment is extremely biodiverse and provides a substrate for aquatic plants and animals, if it becomes anoxic the ecology collapses and waters become eutrophic. Food preservation and storage technology may not be accessible to small scale fishers which increases risk of food-borne illness and acts as a barrier to entry to larger markets.
<i>Use of toxic/bio-accumulative chemicals and antibiotics.</i>	
<i>Environmental contaminants and food safety concerns.</i>	
<i>Use of low value/trash fish, fish meal, and fish oil as feed inputs</i>	May repurpose fish for food, impacting food security. Highly energy and resource consuming as is used in intensified piscivorous aquaculture. Methods of fishing trash fish may be more environmentally degrading than others.
<i>Use of wild-caught seed and associated by-catch.</i>	Wild-caught seed reduces wild spawn which directly impacts populations. Methods for catching seed can be unselective and wasteful.

The table above summarizes a number of concerns cited by Tacon et al. (2010) which are applicable to aquaculture practices in Vietnam, and their potential implications. Given the questionable nature of the sustainability of global fisheries activity, and the as yet unproven potential for aquaculture to replace declining stocks and fishing livelihood activities, the impact of declining fish stocks on the vast number of people who depend on fishing in the small-scale for subsistence and for income begs further investigation.

The wealth generated by the fisheries sector, according to Allison (2011), and its contribution to poverty reduction and food security flows through four interlinked pathways: " (i) nutritional benefits through the consumption of fish; (ii) income to those employed in the sector; (iii) multiplier and spillover effects in fishery-dependent regions; and (iv) through generation of revenues from exports, taxation, license fees and from payment for access to resources by foreign fleets or foreign investment in aquaculture."

Table 2 World and Vietnam fisheries production quantity and value by production method, 2010. N/A indicates that the data are not available. Source: FAO, 2012.

Production method	Quantity (million tonnes)		Percentage of total quantity		Value (billion USD)		Percentage of total value	
	World	Vietnam	World	Vietnam	World	Vietnam	World	Vietnam
<i>Capture</i>	68	2.4	53	47	98.5	N/A	45	N/A
<i>Aquaculture</i>	60	2.7	47	53	119	5.2	55	N/A
<i>Total</i>	128	5.1	100	100	217.5	N/A	100	N/A

The FAO estimates that 128 million tonnes of fish were captured or farmed in 2010, with a total value of 217.5 billion US dollars (FAO, 2012). Fishing and aquaculture activities provide income and sustenance for an estimated 54.8 million people around the world, 87 percent of whom are in Asia (FAO, 2012). When secondary activities such as processing, shipping and marketing are also considered along with the dependents of those involved in this employment, it is estimated that fisheries and aquaculture support the livelihoods of 660-820 million people, accounting for 10 to 12 percent of the world's population (FAO, 2012). In addition to income, fishing can provide an important source of protein and micronutrients to fishers and their households (Allison, 2011; FAO, 2012). As seen in Figure three, the global food fish supply has nearly doubled to 18.6 kg per capita since the 1960's (FAO, 2012).

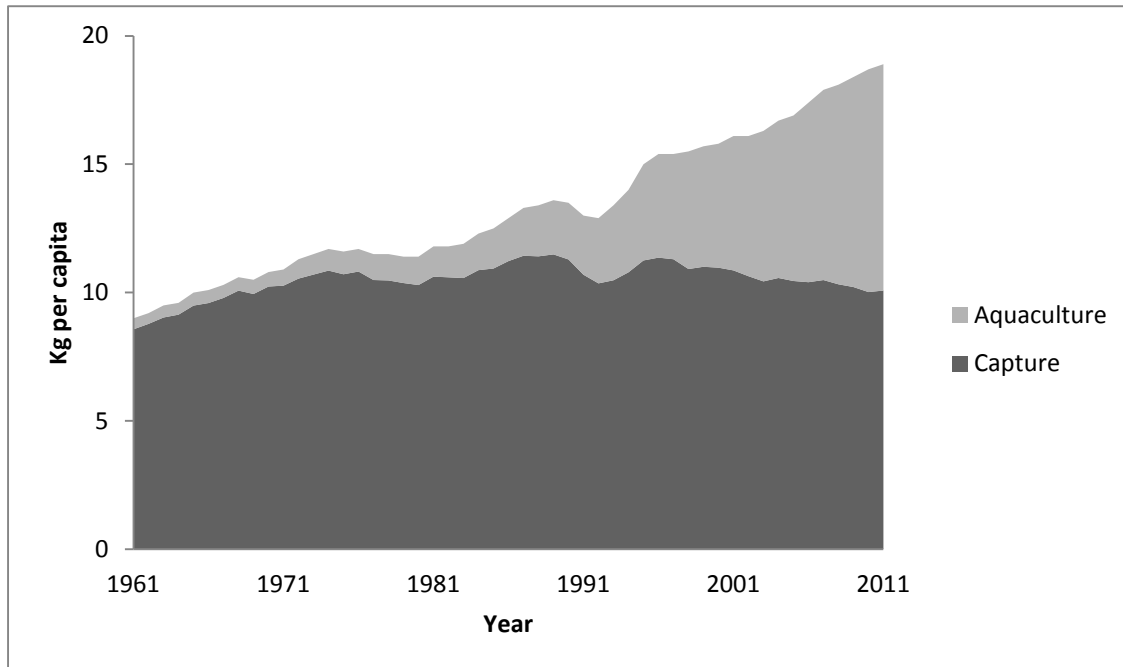


Figure 3 Global food fish supply by production method, 1961 – 2011.

Approximately 17 percent of the world’s consumption of animal protein was provided by fish in 2009, overall, when including plant protein consumption, fish accounts for 6.5 percent of global protein consumption (FAO, 2012).

Fisherpeople in developing countries are often characterized as the poorest of the poor, and fishing as an activity of last resort (Allison, 2011; Arthur & Friend, 2011; Béné, 2009). Research shows that the role of fishing in the livelihood portfolios and nutritional consumption of people in developing countries and the wealth and health contributions it creates varies greatly depending on many factors including geography, social status, access to capital, proximity to natural resources and markets (Allison, 2011; Belton et al., 2011; Béné, 2009). Caution should be exercised when prioritizing or ranking livelihood activities as household portfolios often include numerous activities such as fishing, aquaculture, agriculture, self-employment, and wage or salaried employment and a variety of changing circumstances will have an effect on the proportion of income generated by any one activity at any particular time (Arthur & Friend, 2011). Seasonality, the robustness of local, regional, national and international markets, weather events, climate events, competition for resources, environmental degradation, and disease and pestilence are all potential factors in the amount of income generated by fishing at any given moment.

Diversification of livelihood portfolios is one way for fishers to reduce their exposure to shocks and aquaculture is frequently heralded as an obvious livelihood alternative for fishers exposed to declining incomes caused by declining fish stocks (Ahmed & Lorica, 2002; Allison, 2011; Anh et al., 2011; Belton & Thilsted, 2013; McClanahan et al., 2013). Analyzing the situation from a vulnerability perspective allows us to investigate the complex and dynamic linkages between a community’s exposure to stressors as a whole and a household’s sensitivity to shocks and resilience or adaptive capacity in the face of these shocks. The ability to address vulnerability at the household scale is critical to understanding fisheries transitions in developing nations where they may play a major role in the livelihoods of many

small-scale or artisanal fishers. Unfortunately household level data suitable to this type of analysis is uncommon.

Vulnerability frameworks

The concept of vulnerability is applicable in a diverse array of research contexts. While it originates from the fields of geography and natural hazards (for current examples see Pelling, 2003; Smit, 2008; and Sobiech, 2013), it is currently employed in numerous fields including disaster management (see Duncan & Brebbia, 2009; Birkman, 2006), public health (Duncan & Brebbia, 2009; Langan & James, 2005; Hoff, 2001), development (Siddharthan & Narayanan, 2013; McGregor, 2009; Martín et al., 2003), secure livelihoods (Hampshire et al., 2009; Moser 1998), and climate impact and adaptations (Schipper & Burton, 2009; Van den Bergh et al., 2009; Smith et al.2003), each area with its own conceptualization. In this section several examples of vulnerability frameworks will be reviewed including those proposed by McClanahan et al. (2013), Béné (2009), and Cinner et al. (2012). This is preceded by Füssel’s generalized conceptualization of vulnerability (2005).

Following a thorough review of vulnerability frameworks in the academic literature Füssel proposes an abstraction of the context of a vulnerable assessment in order to harmonize various definitions of vulnerability into a single framework (Füssel, 2005). He identifies the following four dimensions of vulnerability:

1. The **system** (the geographic area, population, or complex of interacting entities being considered);
2. The **hazard** (the extrinsic stimulus or stimuli that may negatively impact the system);
3. The **valued attribute** (the aspect of the system which is at risk given exposure to the hazard);
4. The **temporal reference** (the period of time studied) (Füssel, 2005).

Füssel then presents a two-dimensional classification scheme for vulnerability factors in order to help distinguish between what he sees as the largely independent dimensions of vulnerability factors, scale and disciplinary domain (Füssel, 2005). **Scale** is determined by whether the vulnerability factors are internal or external. Internal factors are characteristics of the vulnerable system or community itself, or those which can be controlled by the community. All other factors are considered external with the understanding that the scope of the vulnerability assessment will impact whether or not a factor is internal or external (Füssel, 2005). The **disciplinary domain** will be either socioeconomic or biophysical, although Füssel allows that these two categories may overlap (Füssel, 2005). Combining the four dimensions of vulnerability and the four possible classes of vulnerability factors, Füssel describes three major frameworks or vulnerability research which are summarized in the table below.

Table 3 Correspondence between conceptualizations of vulnerability. A question mark denotes that the factor “may or may not be included in the respective conceptualization of risk” (Füssel, 2005). Source: Reproduced from Füssel, 2005.

<i>Approach</i>	<i>Vulnerability factors</i>				<i>Denotation</i>
	<i>Internal socioeconomic</i>	<i>Internal biophysical</i>	<i>External socioeconomic</i>	<i>External biophysical</i>	

<i>Risk-hazard</i>	-	X	-	-	Internal biophysical vulnerability
<i>Social constructivist</i>	X	-	?	-	Cross-scale socioeconomic vulnerability
<i>Hazard-of- place</i>	X	X	?	X	Cross-scale integrated vulnerability

For a generic definition of vulnerability which can be applied to a variety of contexts, Fussel turns to Adger and Kelley (1999):

“...the state of individuals, groups or communities in terms of their ability to cope with and adapt to any external stress placed on their livelihoods and well-being. [...] It is determined by the availability of resources and, crucially, by the entitlement of individuals and groups to call on these resources.”

McClanahan et al. (2013) define vulnerability in the context of fisheries using a simple equation whose terms are commonly used to define a group’s vulnerability to climate change, and which has generally found favor with authors describing vulnerability to biophysical phenomena (McCarthy et al., 2001).

$$\text{Vulnerability} = (\text{Exposure} + \text{Sensitivity}) - \text{Adaptive Capacity}$$

Here exposure is defined as the “degree to which the fisheries system is stressed by direct human use of the resources and the range of environmental stressors on fisheries production systems. [...] Exposure is characterized by the magnitude, frequency, duration and spatial extent of climatic and human disturbances” (McClanahan et al., 2013, p.3). Sensitivity in this context is defined as “The degree to which stress can actually modify the response of a system...” and is “measured by the degree of human dependence on marine resources for food, revenue and income,” and adaptive capacity is the capacity of people to adapt to changes in exposure and sensitivity (McClanahan et al., 2013, p.3). A more descriptive definition of adaptive capacity can be found in Adger & Vincent, “Adaptive capacity is a vector of resources and assets that represent the asset base from which adaptation actions and investments can be made,” it enables a subject to modify exposure to risks, absorb and recover from losses, and exploit new opportunities that arise in the process of adaptation (2005, p.400). The system of concern to McClanahan et al. is identified as being a population dependent on fish for income, revenue or nutrition, the valued attributes being therefore livelihoods, economic exchange and bodily health (2013). The paper identifies the hazards facing the system as follows: “(i) governance challenges”... “(ii) weak and inappropriate access or property rights; (iii) uncontrolled and illegal fishing and other maritime criminal activity”... “(iv) development and trade policies that can conflict with access to resources and food by the poor; (v) climate change threats to coastal and riparian aquaculture and ecosystems” ... “(vi) human settlement and infrastructural developments in coastal areas” ... “(vii) a growing urbanizing and increasingly affluent population making increasing demands for seafood...” (McClanahan et al., 2013, p.2).

The scale, as defined by Füssel, of the vulnerability problem set out by McClanahan et al. is simultaneously internal and external as the vulnerability factors are both under the influence and out of the control of the community in question. Internal factors may be for example overfishing in community allotments or poisoning of local spawning grounds with biocide by local aquaculture producers. External factors could include climate change, policy favoring industrialized fishing fleets which are encroaching on small scale fisherpeople's resources, and reduced access to freshwater due to upstream community or industrial use. The disciplinary domain as described by Füssel is overlapping in this case as both biophysical and socioeconomic factors are at play.

In his assessment of economic vulnerability of small-scale fishing communities, Christophe Béné measures income poverty as the base determinant of the level and nature of poverty and vulnerability. Béné emphasizes that while the chronically poor suffer greater exposure and lower resistance to livelihood shocks, poverty and vulnerability are not systematically correlated, such that functionally vulnerable households (rural households which may not be chronically poor but which are economically insecure and particularly vulnerable to changes in external conditions) may also be highly vulnerable (Béné, 2009). The community analyzed is classified as being in a region functionally or geographically distant from political centres, implying high transaction costs, dysfunctional transport and communication, limited or no access to markets, and low provision of government services and infrastructure (such as education and health services). Béné quantifies vulnerability "through the probability of attaining (or failing to attain) a certain welfare level (be it in terms of income, consumption, education or health), calculated on the basis of past information. Within this framework, a person is considered vulnerable if the probability of attaining this welfare level is lower than a given probabilistic threshold" (Béné, 2009). While longitudinal data are typically required for such a calculation, Béné devises a method of using cross-sectional data to estimate household economic vulnerability. Vulnerability of a given household in a particular moment in time is equal to the coefficient of variation of households' incomes belonging to the same group, times the proportion of total cash-income from the primary activity (or cash dependence of the household) times the diversification of the household's livelihood portfolio multiplied by a poverty gap factor.

$$V_{ig} = CV_g \text{Dep}_{ia} \frac{1}{\text{Div}_i} \text{Pov}_i \quad \text{where } \text{Div}_i = A_i (1 - \text{Dep}_{ia}) + \sqrt{\text{Sub}_i + 1}, \text{ and } \text{Pov}_i = \sqrt{\bar{z}/z_i}$$

Here V is vulnerability, i is the household identifier, and g is the group of households. The factor CV_g represents the coefficient of variation of household's incomes belonging to the same group (exposure). Dep_{ia} is a percentage that varies from 0 to 1 representing the idiosyncratic susceptibility (proportion of cash dependence derived from its main activity a) of household i to shocks (sensitivity). The factor $\frac{1}{\text{Div}_i}$

represents the diversity of a household's livelihood portfolio (adaptive capacity). A_i represents the number of activities in the portfolio so that $A_i (1 - \text{Dep}_{ia})$ accounts for the weighted effect of economic activity

diversification. The term $\sqrt{\text{Sub}_i + 1}$ accounts for diversification through subsistence based activities

which are assumed to have a decreasing marginal positive effect on household vulnerability. Pov_i represents the relationship of the households' daily cash-income to the poverty line ($\sqrt{\bar{z}/z_i}$). This

methodology is effective where longitudinal data do not exist, however it should be noted that since the variability across households cannot be measured across time in cross-sectional data it must therefore be

measured across households. In this case variation across households is a stand-in for consumption or income changes over time in a given community.

Cinner et al. (2012) measure the vulnerability of coastal communities to climate change and its impact on coral reef fisheries using both arithmetic (as in McClanahan et al. 2013) and geometric equations (as in Béné, 2009) and find that the two methods are correlated at $R = 0.9$, suggesting that both methods (in this case) were equally effective in measuring vulnerability (Cinner et al., 2012). This research took place at the household level in a number of communities and employed a unique community sensitivity metric which demonstrated the ratio of fishery to non-fishery related occupations relative to the extent to which households dependent on fisheries also engage in non-fishery livelihood activities, and the directionality of linkages between fisheries and non-fisheries:

$$S = \left(\frac{F}{F + NF} \right) \left(\frac{N}{F + NF} \right) \left(\frac{r_{fn}/2 + 1}{r_{fn} + r_{nf} + 1} \right)$$

where S = sensitivity, F = number of households relying on fishery-related occupations, NF = number of households relying on non-fishery-related occupations, r_{fn} = the number of times non-fisheries related occupations were ranked higher than non-fishing occupations (by the households themselves – in order of importance) and r_{nf} the number of times non-fisheries-related occupations were ranked higher than fishery occupations (Cinner et al., 2012). To measure adaptive capacity Cinner et al. used the social vulnerability index developed by McClanahan et al. in 2008, in which adaptive capacity is measured using the Analytic Hierarchy Process methodology wherein “ten researchers made pairwise comparisons of the importance of eight indicators, stating which was more important for adaptive capacity given the range of values for each indicator.” The eight indicators examined include: recognition of causal agents impacting marine resources; capacity to anticipate change and to develop strategies to respond; occupational mobility; occupational; social capital; material assets; technology and; infrastructure (McClanahan et al., 2008 in Cinner et al., 2012).

Poverty Analysis

Measuring poverty by establishing a baseline income or consumption level necessary for wellbeing and comparing average income/consumption is a long-standing approach to establishing the livelihood context of a population and judging the need for humanitarian intervention and economic development (Sen, 1976). Amartya Sen defined the poverty line measure thusly:

“...involves the choice of a criterion of poverty (e.g., the selection of a ‘poverty line’ in terms of real income per head) and the ascertaining those who satisfy that criterion (e.g., fall below the ‘poverty line’) and those who do not.” (p.219)

Describing the poverty gap measure, Sen says:

“The poverty gap... is the aggregate short-fall of the income of all the poor taken together from the poverty line.” (p.220)

The poverty line headcount is a basic measure and does not take into account the distribution of income/consumption among the poor or the intensity of poverty. The poverty gap on the other hand, measures the depth of poverty, by expressing the relative position below the poverty line of the portion of the population who fall below it, and is used to calculate the minimum cost of eliminating poverty which is defined as the sum of poverty gaps (Haughton & Kandker, 2009). The squared poverty gap, while less commonly used, is the weighted sum of poverty gaps such that the weight is equal to the poverty gap itself (Haughton & Kandker, 2009). This technique highlights the increasing magnitude of poverty gaps as they grow in distance from the poverty line and as such addresses the issue of inequality among the poor and moves one step further from representing the poor as a unified group and expressing the multidimensionality of the experience of poverty (Haughton & Kandker, 2009).

It is widely acknowledged that income is not the only factor related to poverty (Schiller, 2008). It follows then that poverty or income is not the only factor related to development and this has given rise to metrics such as the Human Development Index (HDI) and the recently released Multidimensional Poverty Index created by Sabina Alkire and James Foster. These tools, employed by the United Nation's Development Programme, assess the development of countries with an emphasis on people and their capabilities in addition to economic growth. Currently Vietnam ranks 121st out of 187 countries in the HDI rankings. The following table shows the HDI for three countries in Southeast Asia including Vietnam, showing the components of the HDI equation and their values.

Table 4 Human Development Index and components for select countries in 2013. Source: United Nations Development Programme 2014.

HDI rank	Country	Human Development Index (Value)	Life expectancy at birth (years)	Mean years of schooling (years)	Expected years of schooling (years)	Gross national income per capita (2011 PPP\$)
		2013	2013	2012	2012	2013
89	Thailand	0.722	74.4	7.3	13.1	13,364
121	Viet Nam	0.638	75.9	5.5	11.9	4,892
136	Cambodia	0.584	71.9	5.8	10.9	2,805

Summary of approaches

The following table summarizes the pros and cons of all these various approaches to measuring wellbeing including vulnerability and poverty analysis techniques:

Table 5 Pros and cons of the various approaches to assessing wellbeing.

Work	Description	Comments
McClanahan et al., 2013	Proposes a simplified equation where vulnerability is equal to exposure plus sensitivity minus adaptive capacity in the context of fisheries and food security.	Conceptually instructive but insufficiently developed for calculating an index of vulnerability.
Béné, 2009	The vulnerability of a given household in a particular moment in time is equal to the coefficient of variation of households' incomes belonging to the same group, times the proportion of total cash-income from the primary activity (or cash dependence of the household) times the diversification of the household's livelihood portfolio multiplied by a poverty gap factor.	Detailed equation relying heavily on livelihood portfolio and income data. Can be used to measure household level vulnerability as a snapshot in time where longitudinal data are not available. Complete reliance on income information for calculating adaptive capacity may reduce the index sensitivity. The Vietnam Transitions Survey contains indicators which may reveal more nuance.
Cinner, 2012	Here the sensitivity of communities are measured by multiplying the proportion of households engaged in fishing activities by the proportion of those engaged in non-fishing activities multiplied by a factor representing the number of times non-fisheries related occupations were ranked higher than non-fishing occupations by the households in the communities. Adaptive capacity is measured using the Analytic Hierarchy Process methodology where ten researchers made pairwise comparisons of the importance of eight indicators, stating which was more important for adaptive capacity given the range of values for each indicator.	Sensitivity and adaptive capacity are measured at the community level. The sensitivity calculation could be used for analysis of Vietnam Transition Survey data across three coastal districts. Methodology for creating an index of adaptive capacity could be applied as well, but would require recruitment of suitable experts for the AHP, and would represent a considerable undertaking. Survey data does not include a ranking by households of the importance of fisheries and non-fisheries livelihood activities.
Poverty analysis	Basic measure using an established threshold of wellbeing to determine the proportion of a population living below the threshold, and in the case of the poverty gap, measures the depth of poverty experienced by the population. The squared poverty gap expresses the inequality among the poor by weighting the poverty gap.	Simple equation that relies on the appropriate placement of the threshold in order to ascertain who suffers from poverty and to what degree. Single factor required – income. Data are readily available. Ignores other factors of poverty so is not explanatory, and may sometimes be inaccurate (i.e., fails to capture people experiencing poverty in a non-economic sense).

Vietnam – fisheries and vulnerability

Fisheries account for 4.2 % of Vietnam's GDP (Ha and van Dijk, 2013). In actuality these numbers likely underrepresent the importance of fisheries and aquaculture to Vietnamese production and labour values as national fisheries statistics typically undervalue the contribution of fishers and fish farmers – particularly in developing countries (Allison, 2011; Béné 2009; Scholtens & Badjeck, 2010; FAO, 2012). The following figure highlights the growth in aquaculture production relative to capture fisheries over the previous two decades, and the relative scale of the two production methods in Vietnam.

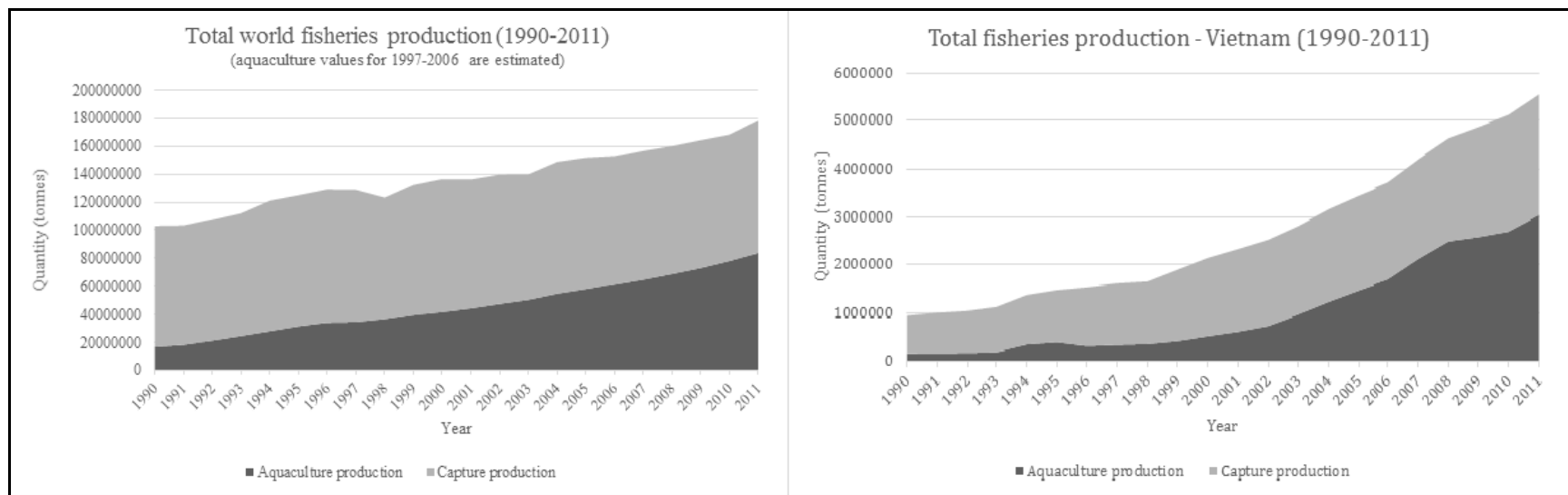


Figure 4 Total world fisheries production quantity and Vietnam fisheries production quantity by production method for the period 1990 to 2011. Global aquaculture values are estimated for the years 1997 to 2006 included. Source FAO Fishstat J

Many people in fisheries and aquaculture engage in the informal sector, moreover, in global databases the value of fisheries sector contribution to GDP often accounts only for the first-sale value of fish, ignoring revenue from processing and services as well as licensing and access fees (Allison, 2011) and this is likely the case in Vietnamese national statistics as well. In Vietnam, aquaculture production has grown almost exponentially over the past two decades, surpassing capture fisheries in production volume by 4.5% with 3110.7 thousand tonnes as compared to 2622.2 thousand tonnes in capture fisheries in 2012 (see Figure 1; FAO, 2013; GSO, 2012). Fisheries exports contributed over \$4.3 billion USD to the economy in 2009, an increase of 112% since 2002 (see Figure 2; FAO, 2012).



Figure 5 Vietnam fisheries export quantity and value, 2002-2009. Source: FAO Fishstat J.

Data on the contribution of small-scale fishers to Vietnam's total fisheries production is limited. An estimated 82% of the total wild or capture fisheries catch is from in-shore or near-shore fishing (Ha & van Dijk, 2009). Near-shore fishing is by definition small-scale as Vietnamese fisheries' law defines near-shore as generally being within a 50-m deep line from the shore, a distance within which only boats of less than 90 horse power are permitted to fish (Pomeroy et al., 2009). Given that the definition of a small-scale fisher is one that operates near-shore using a small vessel with a low capacity motor, and that 80% of mechanized boats in Vietnam have engines less than 45 horse power, it is easy to see that a large proportion of fishers in Vietnam are operating at the small-scale. Vietnam 2011 census data aggregates the number of people employed in the agriculture, forestry and fisheries sectors counting more than 24.3 million people, representing nearly half of Vietnam's employed population at 15 years of age and above (GSO, 2013). Some estimates put the number of people employed directly and indirectly by the fisheries at 3 million, but without proper statistical representation it is impossible to measure the number of people whose livelihoods portfolios include fisheries (Raakjaer et al. in Ha and van Dijk). Arthur & Friend describe fishing in the Mekong Delta as coping strategy or activity of last resort for a large part of the population but caution against morphing observations that poor people fish into an understanding that people are poor because they fish (2011). They also emphasize the importance of all components of the rural household livelihood strategy in supporting a "dynamic, highly interconnected household and community food production and consumption system in which each component contributes to make the overall strategy viable" (Arthur & Friend, 2011). In fact, some authors argue that fishers are not necessarily the poorest of the poor in monetary terms, but are vulnerable in socioeconomic terms due to the fact that they experience high exposure to particular natural, health and economic shocks and disasters (Béné, 2009).

In Vietnam, average fish consumption per capita is 32.2 kilograms per year, or 35.3 percent of animal protein consumed (Belton & Thilsted, 2013). To put this figure in perspective, given that Vietnam's population is 91 million people, this amounts to just over 10% of the 31 million tonnes of fish exported from Vietnam in 2012. The vulnerability implications of exposure to shocks by fishers may be greater where households depend on fish for both income and food. Food insecurity contributes to a positive feedback loop of health and wellness concerns which can have a serious impact on an individual's ability to be economically productive.

There are few studies that examine the household level vulnerability of fisherpeople in Vietnam. In *Pathways of Shrimp Farmers in the Mekong Delta, Vietnam*, Ha et al. compare groups of shrimp farmers using different production modalities (extensive versus intensive) and find that more extensive systems using fewer inputs were more economically sustainable due to a low risk of failure and relatively high net production, but that these fishers were more isolated, lacking in electricity and in education to help improve their fish farming practices (Ha et al., 2013). Other issues faced by these extensive producers were access to markets due to lack of transportation and lack of enforcement of policy governing forestry rights and forest improvements. For intensive shrimp farmers, lack of a properly functioning water system, more frequent harvest failure, fluctuating shrimp prices and market competition were central issues (Ha et al., 2013). Research is needed at the household level that examines the vulnerability of all types of fishers and fish farmers particularly in a policy atmosphere where fishing and aquaculture are promoted as drivers of national and local economic development. With such a large proportion of the Vietnamese people engaged in the fisheries sector, the question of equality in the distribution of resources and benefits is of central importance.

Methods

The survival landscape for Vietnamese households relying on the fisheries sector (including aquaculture) for part of their livelihoods is changing. Methods for analyzing household or community level vulnerability to declining fish stocks and low fish farming yields should be applied in order to guide policy and practice relating to income generating activities such as fishing, aquaculture and agriculture. Measurement of a community's vulnerability can be accomplished by assessing households' exposure and sensitivity to shocks and their adaptive capacity.

The Vietnam Transitions Survey

The survey was carried out in two provinces, three districts, and twelve communes (with one to eight villages per commune). Assessing households from a variety of geographical locations helped to capture considerable variation between the districts, and communes. This variation exists along a number of dimensions including development of the fishing sector, the balance between capture fishing and aquaculture, the speed of the fisheries transition, the specific types of species fished, and the overall prosperity of the local economy. Exploiting these variations to understand the fisheries transitions provided the basis for the study's empirical strategy. The survey questionnaire included nine modules: household information; employment and earnings; other sources of income; fishing; aquaculture; assets and housing; loans; risks and coping; and perceptions.

The survey field work was carried out by Vietnamese surveyors affiliated with the Hue University of Agriculture and Camau Agricultural Extension Centre between November 2012 and March 2013. Once the survey villages had been selected, 599 households were surveyed through neighborhood-stratified random sampling. Questionnaires were administered through face-to-face interviews, usually with the household head. On average, the survey took 1 hour to complete. Data was inputted and initially edited by staff of Hue University with final editing and analysis undertaken at the School of International Development at the University of Ottawa.

Data from the Vietnam Fisheries Transition Survey was employed in the creation of an index of vulnerability using the adapted components from the vulnerability framework developed by Béné. This particular framework was chosen because the equation required the least amount of adaptation given that the majority of the data needed for the calculation was readily available. Using VTS data, the level of vulnerability experienced by households of varying levels of income and of varying fisheries (fishing, fish farming) and non-fisheries related livelihood activities (farming, wage, self-employment) was analyzed in order to ascertain patterns of exposure, sensitivity and households' adaptive capacity.

The impact of geography

The survey took place in three regions of Coastal Vietnam. These regions share a tropical climate, but each have distinct biogeoclimatic and geopolitical characteristics which affects the number and type of plant and animal species found there, the size and distance to market, and the overall economic potential of each cluster of households. Dam Doi and Tran Van Thoi in Ca Mau Province of South Vietnam are located in the alluvial flood plain of the Mekong Delta on either side of the southern peninsula and share similar climate characteristics. The Dam Doi coast line is exposed to the maritime climate of the South China Sea whereas Tran van Thoi is sheltered in the Gulf of Thailand. Hue, in Central Vietnam, lies next



Figure 6 Google Earth satellite image showing outline of Vietnam and three surveyed districts.

to a mountain range in the coastal lowlands and features a distinct tropical monsoon climate. Due to the phenomenon of orographic lifting of maritime moisture and the warm air flow descending from the Gobi Desert, the region experiences high precipitation, seasonality (unlike the delta region where there is little to no seasonal variation), and cooler average temperatures than South Vietnam. The Tam Giang, Dong and Cau Hai lagoons play an important role in the local ecosystem and provide a livelihood in fishing and aquaculture for many residents of the area.

All three regions are subject to salt water intrusion. Hue is situated in a large area of salt flats, and the low lands of the Mekong Delta rise no more than three meters above sea level at any given point and is covered in dense jungle and mangrove. Salt water intrusion through flooding and exhaustion of local aquifers puts pressure on freshwater resources and competition for water influences the soil's agricultural potential, and species selection for aquaculture practices.

Vulnerability and the Vietnam Transitions Survey

For each household a primary income generating activity was determined as the largest proportion of total household income earned through fishing, aquaculture, farming, wages, self-employment, or other activities in the survey year. For the purposes of this analysis, data from the farming, wage, self-employment, and other income categories were aggregated in order to compare the characteristics of households who earn the majority of their incomes from the primary fisheries sector (through aquaculture or fishing) to those that earn the greater part of their incomes from wages, self-employment, or other activities (non-fishing and secondary sector fish processing/selling/production). Fishing and aquaculture activities are further divided into near-shore/off-shore, and extensive/intensive aquaculture primary activity categories for a total of 8 possible primary activities. The rationale behind the separation of households into near-shore/off-shore fishing, and extensive/intensive aquaculture is to

capture the wide variety of incomes across the categories as relates to varying species produced and their relative values, as well as the spectrum of capital investment required to participate in each type of activity.

Near and off-shore fishing households' primary income generating activity is fishing, whose average horsepower per boat falls either above or below the 30 horsepower threshold. A similar method is used by the Vietnamese government to distinguish between near and off-shore fishers, however the government horsepower threshold is at 90 hp. Current literature suggests a threshold of 45 hp may more accurately reflect the distinction between small scale near-shore fishers and larger off-shore fishers in Vietnam, but an analysis of the species fished as well as the apparent income gap between near and off-shore fishers in the survey data shows that 30 hp is a more salient threshold in this case (see Appendices I a-d; Pomeroy, 2009).

The distinction between extensive/intensive aquaculture is made for those households whose primary activity is aquaculture, and is determined on the basis of farming techniques stated in the survey which are extensive, improved extensive, semi-intensive and intensive. Ground-truthing and survey follow-up interviews show that fish farmers identifying their practices as semi-intensive aquaculture are in fact engaged in a less input-reliant form of aquaculture than is normally associated³ with extensive practices (Marschke & Betcherman, draft). For this reason, households reporting extensive, improved extensive and semi-intensive practices are assigned the primary activity category - aquaculture extensive, and only those households specifically reporting intensive practices are categorized as aquaculture intensive.

³ "Extensive systems use low stocking densities (e.g., 5 000-10 000 shrimp post larvae (PL)/ha/crop) and no supplemental feeding, although fertilization may be done to stimulate the growth and production of natural food in the water. Water change is effected through tidal means, i.e., new water is let in only during high tide and the pond can be drained only at low tide. The ponds used for extensive culture are usually large (more than two ha) and may be shallow and not fully cleared of tree stumps. Production is generally low at less than 1 t/ha/y.

Semi-intensive systems use densities higher than extensive systems (e.g., 50 000-100 000 shrimp PL/ha/crop) and use supplementary feeding. Intensive culture uses very high densities of culture organism (e.g., 200 000-300 000 shrimp PL/ha/crop) and is totally dependent on artificial, formulated feeds. Both systems use small pond compartments of up to one ha in size for ease of management.

Semi-intensive and intensive culture systems are managed by the application of inputs (mainly feeds, fertilizers, lime, and pesticides) and the manipulation of the environment primarily by way of water management through the use of pumps and aerators. Feeding of the stock is done at regular intervals during the day. In intensive shrimp culture, the computed daily feed ration is given in equal doses from as low as three to as high as six times a day. Water change is also effected on a daily basis, with approximately 10-15% of the water in the pond replenished by the entry of new water in semi-intensive shrimp ponds.

Semi-intensive and intensive culture systems are therefore more labor-intensive than extensive systems which need little attention, and are costlier to set up and operate, not to mention the fact that they also carry higher risks of mortalities resulting from disease, poor management, and/or force majeure (e.g., from anoxia due to non-functioning aerators during times of power failure).

Production is of course much higher (for example, ranging from a minimum of 1.5 t/ha/crop from semi-intensive shrimp culture to a high of 10 t/ha/crop from intensive shrimp culture). Financial returns are therefore much more attractive than those from extensive culture, although studies have shown that the return on investment (ROI) from semi-intensive culture is better than from intensive culture due to the high cost of inputs (largely fry and feeds) used in intensive culture."

From: Baluyut, E. A. (1989). Aquaculture systems and practices: a selected review. United Nations Development Programme & Food and Agriculture Organization of the United Nations. Rome. <http://www.fao.org/docrep/t8598e/t8598e05.htm>

Three issues arose when analyzing the income data in conjunction with the assignment of a primary household activity: a number of households reported income of equal value from two activities where one of these incomes would be used to determine the household's primary activity; a number of households had missing income values where the respondent indicated some form of income existed but a specific value was not reported by the respondent; some households reported income values of zero or negative income values.⁴ In the case of households reporting equal majority values in income, each record was evaluated to determine which primary activity was a best fit, and the household's primary activity was duly imputed. This evaluation was based on household income generating activities in other years as well as fishing and aquaculture capital reported. Where missing and/or negative values were reported, imputed values were selected using the mean income values from households in the same primary activity group and in the same geographic location (i.e., commune or district). If no other household in the commune shared the primary activity, the mean income value from the shared primary activity group in the same district was used for imputation. In the absence of reference records with a geographical match, the sample average for the shared primary activity was used to impute incomes for missing or negative values.

A special case was determined to exist in commune 5 where interviewer bias was introduced at the household selection stage, and a number of households earning unusually large incomes from offshore fishing were selected as part of the sampling method. As a result these households cause the mean fishing and mean total income values to be skewed upward. Since using these outlier households as reference values for imputation would cause an inaccurate inflation of fishing and total income values for households in the commune where income imputation was required, all households with known fishing income values greater than one standard deviation above the mean ($n=5$) were excluded from the mean fishing calculation used for imputing missing values. As a result of this manipulation, average fishing and consequently average total income was adjusted downward.

Adaptation of the Béné vulnerability equation

The primary reason for selecting the Béné vulnerability method over the one developed by Cinner et al. is that the Béné method is more readily adaptable to the data collected in the VTS. The Béné vulnerability calculation is designed to capture vulnerability in households who experience poverty not only chronically, but also transiently, using snapshot data in lieu of cross sectional data. This is a challenging proposition given that cross-sectional data will capture income values at a single point within the spectrum of a household's prospective annual wealth. Bypassing the need to capture income over time to express the dynamism of income fluctuations, the equation captures the following dimensions of income diversity and impact; the coefficient of variation of household' incomes belonging to the same group (CV_g), the proportion of cash income of the household derived from its main activity (Dep_{ia}), the weighted effect of economic diversification ($A_i(1 - Dep_{ia})$) plus the diminishing impact of subsistence activities ($\sqrt{Sub_i + 1}$), and the relationship of the households' daily cash-income to the poverty line

$$(\sqrt{\bar{z}/z_i}).$$

⁴ Zero and negative income values were distinguished from blank responses on income where it was evident from responses to other questions in the survey that the household was engaged in the activity to some extent. From this, it seems reasonable to assume that the activity in question did generate some income, and the negative or zero value likely reflected a data collection error or a misunderstanding of the income question. Regarding the latter, this could be, for example, where the respondent reported a net income figure (i.e., revenues minus costs), when the proper response would be a gross revenue figure.

$$V_{ig} = CV_g Dep_{ia} \frac{1}{Div_i} Pov_i \text{ where } Div_i = A_i (1 - Dep_{ia}) + \sqrt{Sub_i + 1}, \text{ and } Pov_i = \sqrt{\bar{z}/z_i}$$

Essentially, the Béné equation emphasizes the diversity and varying impact of income generating activities in addition to the amount of total income generated. The data collected includes 74 farming households which were also engaged in fishing activities reporting an average income of \$1.19 USD per day (in 2009). These households are located in the Salonga Region of the Congo Basin in the Democratic Republic of the Congo. In the absence of nearly any infrastructure, “geographically and frictionally (distance x time) distant from locations of economic activity, urban agglomerations and political centres,” the households surveyed experience high levels of risk and are chronically poor (Béné, 2009). For the purposes of data analysis, the households were grouped according to their proximity to one of two geographic locations, and their residence in, or need to travel to, the market centre. By contrast the VTS samples includes 599 households engaged in a variety of income generating activities some of which include farming or fishing. The average daily household income for VTS households is \$19.05 USD⁵, significantly higher than in the Salonga survey.

Table 6 Average daily income of VTS survey households in 2012 USD. Conversion rate is the average for 2012 at 1 USD = 20,689.9 VND

Primary sector	Count	Mean USD per day
All sectors	599	19.56
Fishing as primary activity - near-shore	127	12.44
Fishing as primary activity - off-shore	67	85.47
Aquaculture as primary activity - extensive	210	8.63
Aquaculture as primary activity - intensive	46	19.42
Other as primary activity	149	11.47

The VTS households are less geographically or frictionally isolated from urban centres, but are still subject to poor infrastructure. For the purposes of calculating the coefficient of variation (CV_g), the VTS households were grouped by region as in the Salonga survey, but not by relative proximity to market centre. Instead the VTS households were grouped by primary income generating activity, and by geographic location (at the commune level). Aside from contextual differences, the VTS respondents were not asked to distinguish which, if any, of their activities were for subsistence only. As a result, replicating the vulnerability calculation using VTS data required some adaptation of the equation such that all households were given a value of $Sub_i = 1$ since removing the Sub_i term altogether from the

equation creates the possibility of a zero value in the denominator of the Div_i calculation. Finally, the poverty line as determined for Salonga was determined by different methods than that of Vietnam (the poverty line was universally set to 1 for all households for the Salonga data and the poverty line was set to 653,000 VND for the VTS poverty gap calculation based on Government Statistics Office (GSO) & World Bank recommendations for rural households in Vietnam (Kozel, 2014)).

⁵ Average rate of currency exchange USD to VND for the year 2012 was 1 USD=20,689.9 VND. Average annual income per household (147,750,000 VND)/365 days/average conversion rate in 2012 (20,689.9 VND)=\$19.05 USD.

Method of poverty analysis

Haughton & Kandker describe the first two steps in measuring poverty as; “Defining an indicator of welfare,” and “Establishing a minimum acceptable standard of that indicator to separate the poor from the nonpoor (the poverty line)” (p.10, 2009). Poverty analysis is conventionally performed using consumption or income data. The selected poverty line for this project is 653,000 VND which was calculated based on consumption data using the Vietnam Household Living Standards Survey of 2010 in a joint endeavor between Vietnam’s GSO and the World Bank. While commune level poverty data is available from the GSO using the bottom-up approach developed by the Ministry of Labor, Invalids, and Social Affairs (MOLISA) which is described in the literature review, the GSO – World Bank method uses adjusted dollars and is intended to provide a consistent method of measurement over time and across geographic regions, using a single questionnaire. The MOLISA data however is generated in real dollars every 5 years from a varying collection of commune-level surveys and consultations for the purposes of identifying recipients and benefits of government programs. It is therefore most appropriate to compare the VTS data to this uniform measure as it enables comparisons of VTS data across disparate geographic profiles. It should be noted that the established poverty line was generated using consumption data while the VTS measures gross income and not consumption. Ideally one would measure the difference between household consumption and an established consumption benchmark, but given the data at hand, measuring income relative to a consumption benchmark will yield satisfactory (though less well-defined and informative) results.

The third and final step in measuring poverty according to Haughton and Kandker is “Generating a summary statistic to aggregate the information from the distribution of this welfare indicator relative to the poverty line. Of the three measures of poverty discussed in the literature review – poverty headcount ratio, poverty gap, and squared poverty gap – the squared poverty gap is probably used with the lowest frequency, and the poverty headcount ratio the highest. Poverty gap measures are fairly common in institutional documentation and policy analysis papers, and given that the poverty gap indexes the depth of poverty experienced by households, it is a natural fit for comparison to vulnerability results. The poverty (G_i) gap is defined as the poverty line (z) minus actual income for those below the poverty line. The poverty gap is then divided by the poverty line (z) and averaged to create the poverty gap index.

$$P_1 = \frac{1}{N} \sum_{i=1}^N \frac{G_i}{z}$$

Data

Vietnam Transitions Survey data overview

This chapter functions as a general overview of the data from the Vietnam Transitions survey, first dividing households into groups characterized by the household's primary income generating activity, and then further dividing these groups by their geographic location. Using basic descriptive statistics, this chapter will examine household income, assets, levels of education, occupancy, land availability, residence quality, and will identify the frequency and quantity of aquatic species typically farmed and fished.

Basic analysis by primary activity

The survey sample numbers 599 households. The average total annual household income in 2012 was 131.73 million Vietnamese Dong (VND) with a standard deviation of 261.71 indicating a wide variation in total income across households and supporting a more detailed classification scheme (see Appendix II a). In the greater context, the 2010 Vietnamese Household Living Standards Survey conducted by the Government Statistics Office (GSO) which has a sample size of 69,360 households reported an average annual income of 77.158 million dong for rural households (see Appendix IV).

Table 7 Average total income and income sub-categories in million VND

Primary sector	Count	Mean (Million VND)	S.D.
All sectors	599	147.75	269.96
Fishing as primary activity - near-shore	127	93.92	98.67
Fishing as primary activity - off-shore	67	645.44	572.34
Aquaculture as primary activity - extensive	210	65.14	50.74
Aquaculture as primary activity - intensive	46	146.65	89.7
Other as primary activity	149	86.6	77.2

Households primarily engaged in off-shore fishing (n=67) reported an average total 2012 income of 645.44 million VND, compared to near-shore fishing households (n=127) who reported an average 93.92 million Vietnamese dollars in income. This remarkable difference can be attributed to the high monetary value of deep water, carnivorous fish which are caught with equipment requiring a substantial investment. The possession of physical capital such as high powered fishing vessels and deep water gear may contribute positively to a household's ability to invest, thereby improving the ability of the household to generate income. By contrast, near-shore fishing households typically capture low value fish species using smaller boats and less sophisticated equipment. Fishing at this scale is much more labour intensive and less fiscally rewarding. Near-shore fishers are also more likely to report income from aquaculture and non-fishing activities than off-shore fishers suggesting that a lower income leads to diversification as a method of compensation. Overall, the most commonly fished species are shrimp, squid and trash fish accounting for approximately 54% of reported species fished (see Figure 3).

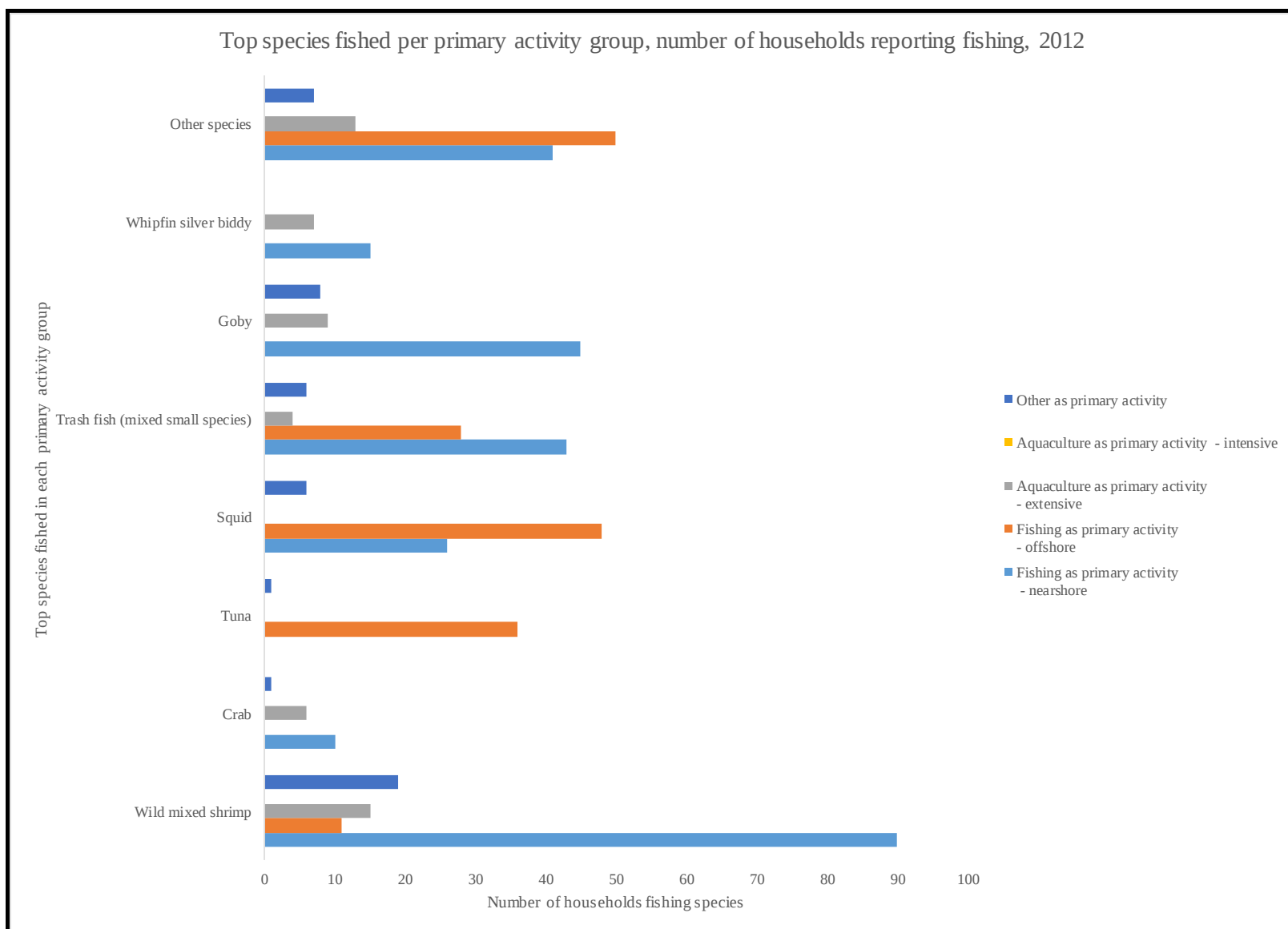


Figure 7 Top species fished per primary activity group, number of households reporting fishing, 2012

The average amount of shrimp caught per household reporting (n=135) is 1,420 kg (see Appendix III d). Squid (n=80) and trash fish (n=80) weigh in at an average 10,143 kg and 10,893kg per household respectively. Near-shore fishing households fish shrimp, goby and trash fish predominantly while off-shore fishing households fish mainly squid, tuna and mackerel.

Households primarily engaged in extensive aquaculture (n=210) reported an average total 2012 income of 65.14 million VND (the lowest average income level across all sectors), compared to intensive aquaculture households (n=46) who reported an average 146.65 million Vietnamese dollars in income. While not as extreme a difference as between near and offshore fishing, intensive aquaculture requires a greater investment in inputs, technology and management than extensive aquaculture and consequently provides a better return (while posing a greater risk due to disease, resource shortage, weather events etc.). Extensive aquaculture is less risky and less input intensive as well as less fiscally rewarding. Typically households in aquaculture are more likely to derive additional income from non-fishing activities than fishing as only 64 of 256 aquaculture households report fishing income while 139 aquaculture households report non-fishing activities. Overall, the most commonly farmed species are black tiger shrimp, crab and rabbitfish accounting for approximately 85% of reported species farmed (see Figure 4).

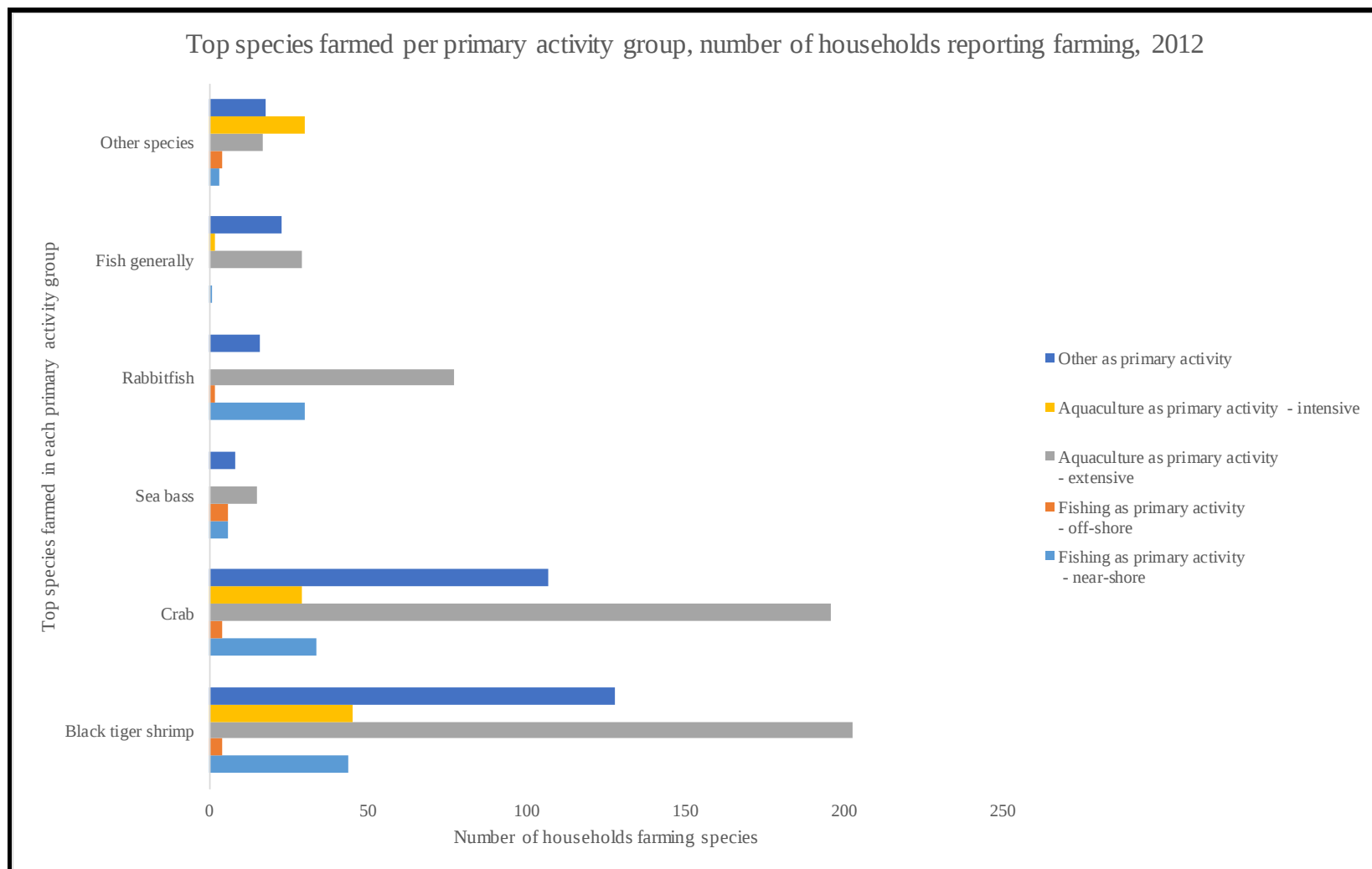


Figure 8 Top species farmed per primary activity group, number of households reporting farming, 2012

The average amount of black tiger shrimp farmed per household reporting (n=419) is 462 kg (see Appendix III h). Crab (n=349) and rabbitfish (n=122) weigh in at an average 132 kg and 176 kg per household respectively. Extensive and intensive aquaculture households farm black tiger shrimp, crab and rabbitfish predominantly.

Households whose primary income generating activity is not fishing or aquaculture but farming, wages, self-employment or other activities or sources (n=149) reported an average total 2012 income of 86.6 million VND. Self-employment and wage earnings generated an average 89.8 and 42.87 million VND respectively for these households while agriculture and unspecified 'other' activities represent an average 12.5 and 11.76 million VND (see Appendix II b). A substantial number of primarily 'Other' activity households (n=123) report aquaculture income but make an average 5 million VND less than the overall annual average. Extensive aquaculture is less risky and less input intensive as well as less fiscally rewarding. The most common species farmed by households in the 'Other' activity group are black tiger shrimp, crab and fish generally while the most commonly fished species are shrimp, goby and squid (see Appendices III a & III e).

On average there are 4.74 members per household in the general sample (see Table 6 and Appendix I g).

Table 8 Total number of occupants and average household occupants by sector.

Primary sector	Number of household occupants - households reporting	Number of household occupants - total number of individuals	Number of household occupants - average number of people per household
All sectors	599	2861	4.78
Fishing as primary activity - near-shore	127	599	4.72
Fishing as primary activity - off-shore	67	304	4.54
Aquaculture as primary activity - extensive	210	1005	4.79
Aquaculture as primary activity - intensive	46	220	4.78
Other as primary activity	149	733	4.92

Households whose primary livelihood activity is 'Other' have the highest average number of occupants at 4.92 people per household. Of the 599 households reporting every household has a member who has achieved some level of education: 71 households have at least one member who has a primary school level of education; 387 households have a member who has achieved a secondary level of education and; 41 households have a member who has achieved a post-secondary level of education (see Appendix II c).

Of the 10 assets surveyed (this includes: car, motorbike, motorboat, rowboat, cell phone, television, stereo, machine pump, computer, fridge, freezer, air conditioner, washing machine, electric cooker, gas cooker, water heater) the average number of household assets numbers 6.04 assets (see Table 8).

Table 9 Average number of assets per household by primary activity, 2012

Primary sector	Assets - households reporting	Average assets per household
All sectors	599	6.04
Fishing as primary activity - near-shore	127	5.01
Fishing as primary activity - off-shore	67	7.51
Aquaculture as primary activity - extensive	210	5.94
Aquaculture as primary activity - intensive	46	7.54
Other as primary activity	149	5.93

No respondents claimed cars, and few households report having televisions, computers, freezers, air conditioning, washing machines, water heaters or microwaves. Off-shore fishing households have the greatest average number of assets at 7.51 assets per household, and near-shore fishing households have the fewest at 5.01 assets per household (see Appendix II d).

Only 13 of the 596 households reporting indicate that they not to own their house (see Appendix II e). The majority (n=259) of houses are semi-permanent in nature and built of brick or with a tin roof. Permanent homes of concrete number 196 and temporary homes of thatch, 134 (see Appendix II f). The average area occupied by the house (n=259) is 0.008 ha. The average total land area

Table 10 Average total land area in ha, 2012

Primary sector	Total land area - households reporting	Total land area - mean (ha)
All sectors	599	1.56
Fishing as primary activity - near-shore	127	0.56
Fishing as primary activity - off-shore	67	0.24
Aquaculture as primary activity - extensive	210	2.13
Aquaculture as primary activity - intensive	46	2.72
Other as primary activity	149	1.84

available to households (n=599) is 1.56 ha. Average total land area is substantially lower for fishing households in comparison to aquaculture households reflecting the need for land capital in order to practice aquaculture. Non-fishing households also have greater than average total land areas which may be connected to the prevalence of aquaculture activities as part of the group's livelihood portfolio (see Appendix II g).

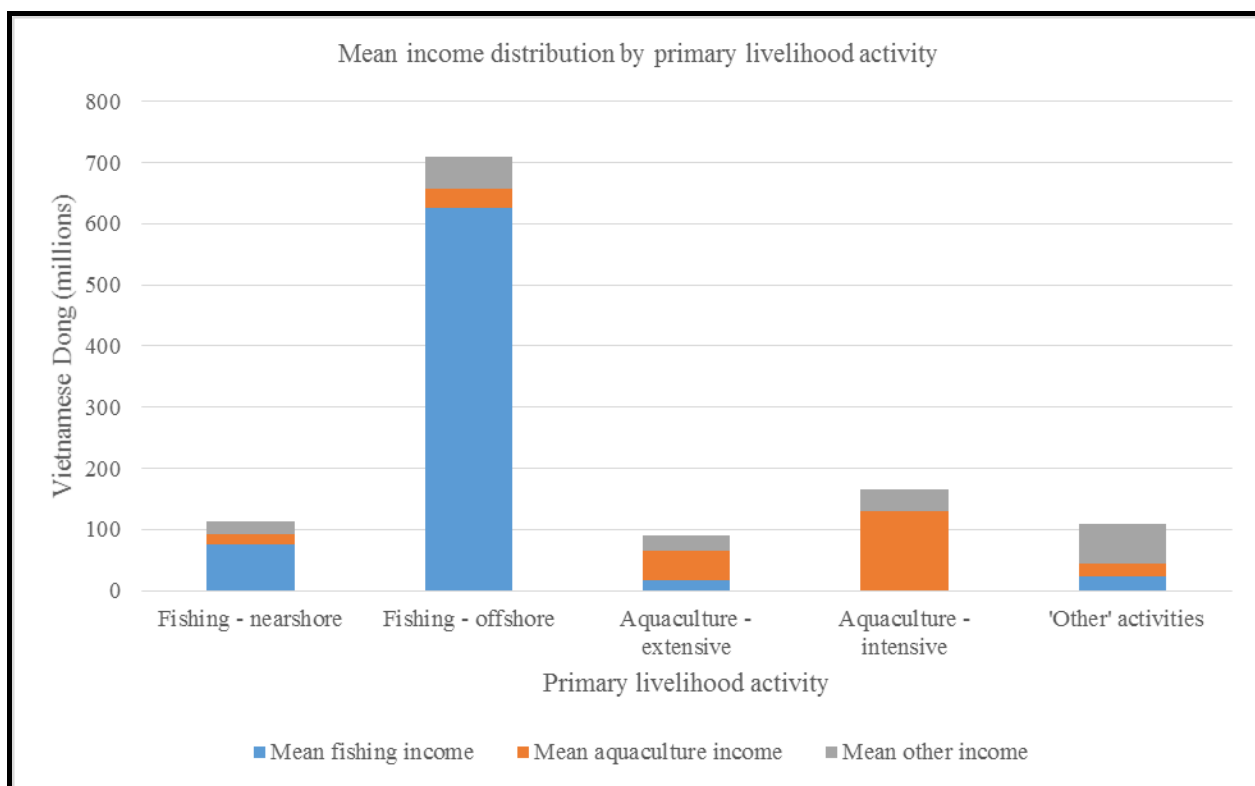


Figure 9 Mean income distribution by primary livelihood activity in million VND.

Basic analysis of the Vietnam Transition Survey data by district

Dam Doi

Dam Doi households primarily earn their income through aquaculture with 77 households making an average 64.56 million VND through extensive production and 34 households earning an average 136.94 million VND through intensive production. Fifteen households earn the majority of their incomes from near-shore fishing (30.6 million VND) and 19 households make an average of 155.44 million VND from off-shore fishing. Non-fishing households (n=75) made an average of 88.21 million VND primarily through self-employment and wage earning activities.

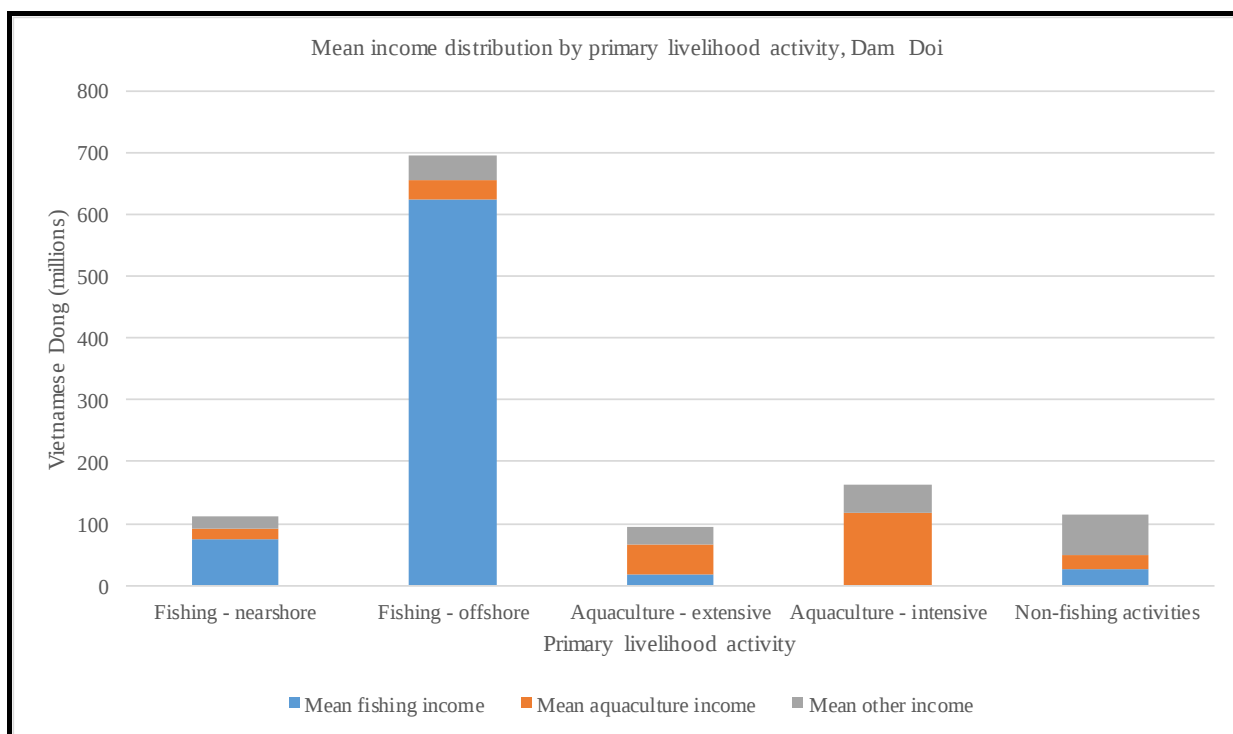


Figure 10 Mean income distribution by primary livelihood activity, Dam Doi, in million VND.

The main species fished in Dam Doi are trash fish (32 reports of an average 3,350 kg per household), shrimp (26 reports of an average 2,412 kg per household), and squid (11 reports of an average 2,855 kg per household). The main aquaculture species farmed are black tiger shrimp (182 reports of an average 660 kg per household), crab (160 reports of an average 128 kg per household), and fish generally (51 reports of an average 371 kg per household).

The average number of people per household in Dam Doi is slightly higher than the survey average at 4.84 occupants per household. Offshore fishing households have the highest average number of household occupants at 5.05 people per household. Of the 220 households in Dam Doi, 13 report the highest level of education achieved by a household member being primary school, 149 report secondary school, and 58 report a member of the household having achieved post-secondary level education.

Households in Dam Doi have an average 5.97 assets out of 10 which is slightly lower than the survey average. Nearshore fishing households report an average of 4.33 assets out of 10, the lowest of all the primary activity groups, and intensive aquaculture households report an average of 7.68 out of 10 assets, the highest of the groups. Most houses in the Dam Doi sample are either semi-permanent (n=83) or temporary (n=87). Only 46 houses are made of concrete. The average total land area is 2.35 ha. As with the survey averages, fishing households have the smallest average total land area with near-shore fishers reporting the smallest area across the entire sample at 0.24 ha.

Tran van Thoi

The largest income earning group in Tran van Thoi (n=46) earns its primary income through ‘Other’ activities making an average 97.64 million VND mostly through self-employment. Forty-five households whose primary income generating activity is extensive aquaculture made an average of 61.38 million VND, and 12 households earning an average 174.15 million VND through intensive production. Thirty-four households earn the majority of their incomes from near-shore fishing (215.56 million VND) and 42 households make an average of 946.70 million VND from off-shore fishing.

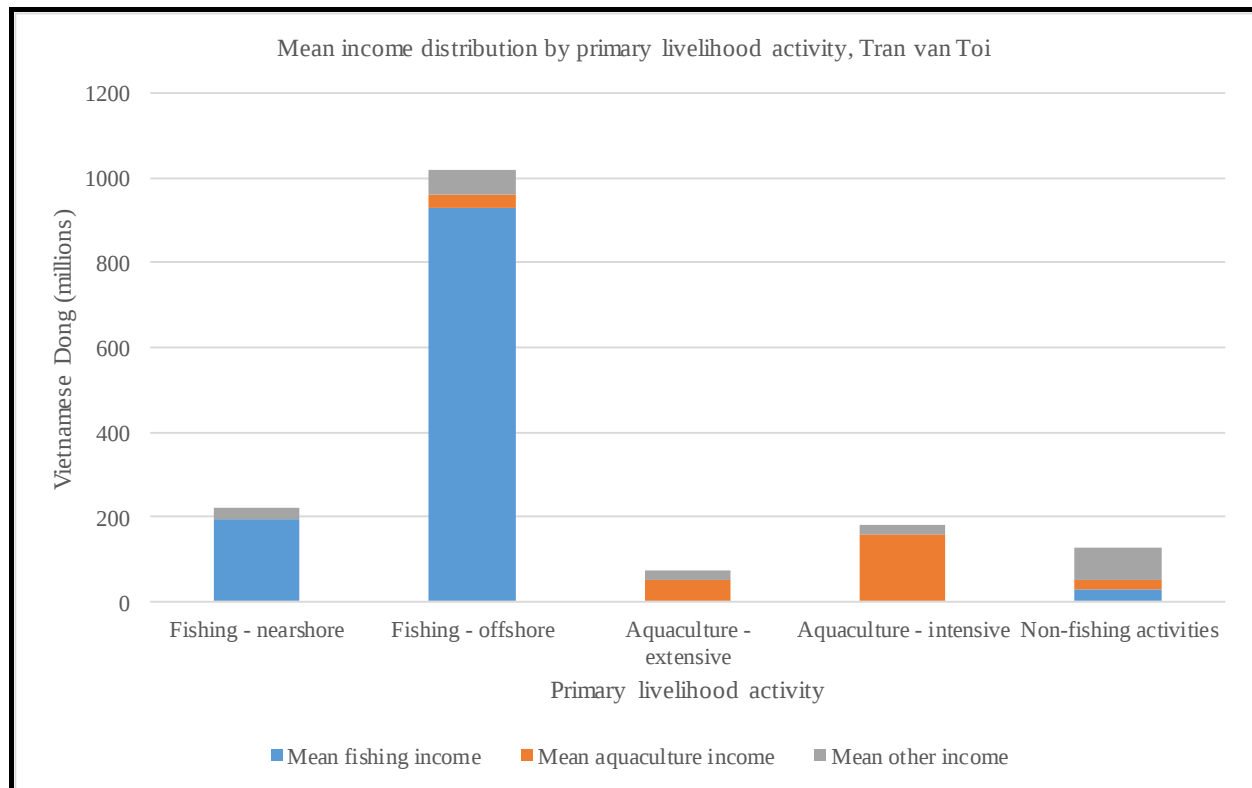


Figure 11 Mean income distribution by primary livelihood activity, Tran van Thoi, 2012, in million VND.

The main species fished in Tran van Thoi are squid (69 reports of an average 11,304 kg per household), trash fish (31 reports of an average 24,664 kg per household), and tuna (29 with an average 7,203 kg per household reports). The main aquaculture species farmed are black tiger shrimp (100 reports of an average 528 kg per household), crab (88 reports of an average 138 kg per household), and sea bass (5 reports of an average 176 kg per household).

In Tran van Thoi, the average number of people per household is lower than the survey average at 4.30 occupants per household. Intensive aquaculture households have the highest average number of household occupants at 4.92 people per household. Of the 179 households in Tran van Thoi, 19 report the highest level of education achieved by a household member being primary school, 123 report secondary school, and 37 report a member of the household having achieved post-secondary level education.

Households in Tran van Thoi have an average 6.54 assets out of 10 which is slightly higher than the survey average of 6.04 assets. Nearshore fishing households report the lowest average, 4.62 assets out of 10, and off-shore fishing households report an average of 8.69 out of 10 assets, the highest value of all groups in the entire sample. Most houses in the Tran van Thoi sample are semi-permanent (n=106). Temporary houses number 29, while only 40 houses are made of concrete. The average total land area is 1.16 ha. As with the survey averages, fishing households have the smallest average total land area while aquaculture and non-fishing households report the highest values.

Hue

The typical Hue household earns their primary income through extensive aquaculture with 88 households out of 200 making an average 67.55 million Vietnamese Dong. No households in Hue practice intensive aquaculture as most make their livings from the Tam Giang, Dong and Cau Hai lagoons which are co-managed by residents and government representatives. Seventy-eight households earn an average 53.07 million VND through nearshore fishing. There are only 6 households in Hue whose primary activity is off-shore fishing earning an average 88.23 million VND in 2012. Thirty five households earn the majority of their incomes from 'Other' activities generating an average 64.17 million VND, mostly from self-employment and wages.

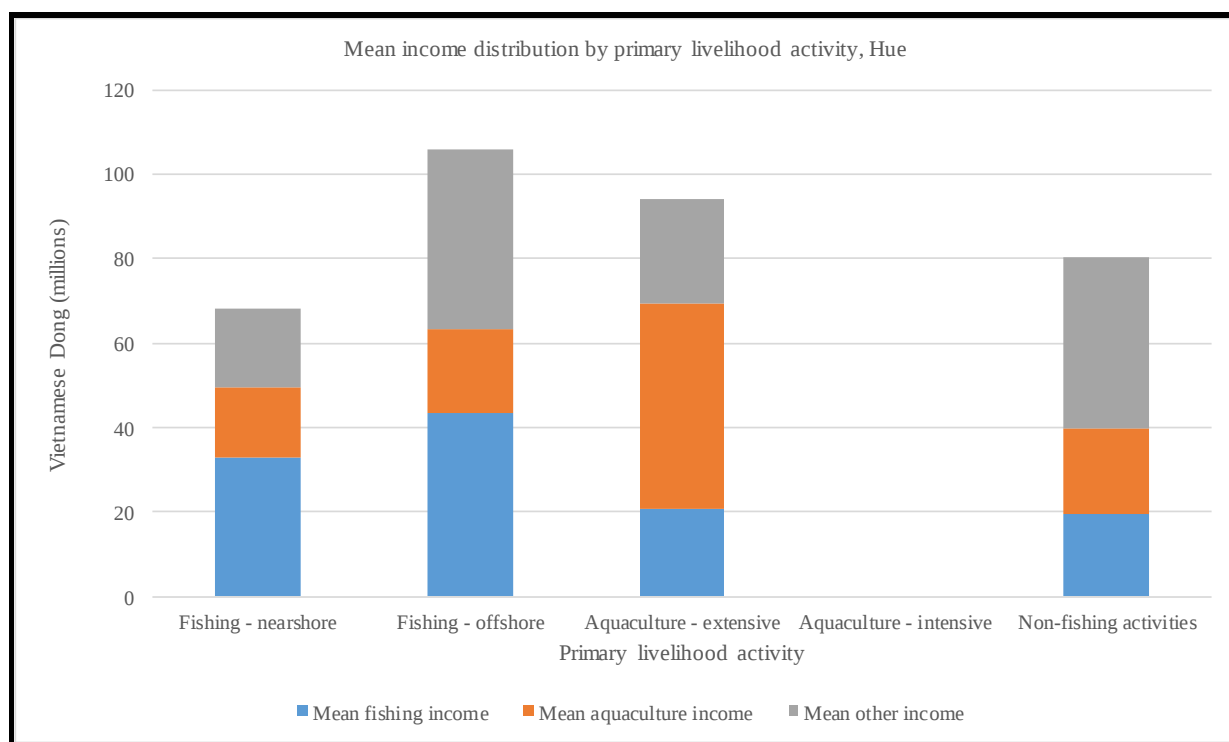


Figure 12 Mean income distribution by primary livelihood activity, Hue, 2012, in million VND.

The main species fished in Hue are shrimp (88 reports of an average 348 kg per household), goby (62 reports of an average 206 kg per household), and whipfin silver biddy (22 reports of an average 103 kg per household). The main aquaculture species farmed are black tiger shrimp (137 reports of an average 150 kg per household), rabbitfish (122 reports of an average 176 kg per household), and crab (121 reports

of an average 134 kg per household).

In Hue, the average number of people per household is higher than the survey average at 5.14 occupants per household. Off-shore fishing households have the highest average number of household occupants at 5.67 people per household. Of the 200 households in Hue, 39 report the highest level of education achieved by a household member being primary school, 115 report secondary school, and 46 report a member of the household having achieved post-secondary level education.

Households in Hue have an average of 5.67 assets out of 10. Near-shore fishing households report the lowest average, 5.31 assets out of 10, and off-shore fishing households report an average of 6.5 out of 10 assets, the highest value of all groups in Hue. Most houses in the Hue sample are made of concrete (n=110) due to a government funded rebuilding program following a typhoon several years ago (Marschke and Betcherman, draft). Semi-permanent houses number 70, while only 18 houses are temporary or made of thatch. The average total land area is 1.06 ha. As with the survey averages, fishing households have the smallest average total land area while aquaculture households report the highest values.

Results

Vulnerability index

Calculations of household vulnerability using the VTS data range from 0.01 (less vulnerable) to 3.78 (very vulnerable). There is no upper bound to the potential vulnerability index scores and the lowest theoretical value is zero if we assume that income is either equal to zero or is positive. Average vulnerability for the full sample is 0.3 with a standard of deviation of 0.36 (see Figure 11; see Table 11). The primary activity group with the highest vulnerability (and lowest average income) is extensive aquaculture at 0.44, and the activity with the lowest vulnerability is near fishing and ‘Other’ activities at 0.21. Despite their extraordinarily high average income, off-shore fishers are in general slightly more vulnerable than near-shore fishers. A closer look at off-shore fishers by district shows that those in Tran van Thoi are the least vulnerable of all subcategories (by district and primary activity) in the sample. The higher vulnerability of off-shore fishers in Dam Doi however, mitigates that of the primary activity category as a whole. In fact, these fishers rank the same in vulnerability (0.54) as extensive aquaculture households in the same district, despite having more than twice the average income as the district’s extensive aquaculture households. Of the three districts, Dam Doi shows the highest level of vulnerability with 0.39 even though it has a significantly higher average income than Hue. This is likely due to the fact that, despite being the least wealthy, Hue households are the most diversified in the sample.

Portfolio diversity (A_i) ranges from 1 to 6 activities with a median number of activities of 2 (see Appendix Va for a cross tabulation of vulnerability and number of portfolio activities). Generally speaking, households engaged in ‘Other’ activities have a greater number of activities in their livelihood portfolio when compared to other primary activity groups. Households in Hue have the greater portfolio diversity when compared to the Mekong Delta districts. Typically vulnerability decreases with portfolio diversity. There are some exceptions however, in Dam Doi and Tran van Thoi, average vulnerability increases slightly from 3 activities to 4 for those households in the ‘Other’ category, and increases between 2 and 3 activities for offshore fishers in Tran van Thoi.

Income dependency (Dep_{ia}) ranges from 0.16 to 1 with an average dependency of 0.767 (see Appendix Vb for a cross tabulation of vulnerability and income dependency). Thirty six percent of households have an average income dependency between 0.9 and 1 which is to say they depend entirely or almost entirely on their primary income generating activity for their household income. Households in offshore fishing demonstrate the highest income dependency and ‘Other’ activity households demonstrate the lowest. Households in Tran van Thoi typically have a high dependency on their primary income, and households in Hue show the least dependency.

Monthly household income per capita ranges from 27,777 VND to 59 million VND with an average value of 2,938,166 VND and 61% of households earning less than 1,500,000 VND which is approximately \$75 USD per capita per month (see Appendix Vc for a cross tabulation of vulnerability monthly household income per capita). Thirty-three offshore fishing households earn more than 10 million VND per capita per month and 32 of these households are in Tran van Thoi.

Table 11 Vulnerability of households by primary activity and district, 2012

Geography	All geographies	All geographies	All geographies	All geographies	All geographies	All geographies
Primary activity	All primary activities	Fishing - nearshore	Fishing - offshore	Aquaculture - extensive	Aquaculture - intensive	Other activities
Households reporting	599	127	67	210	46	149
Mean monthly income income per capita (million VND)	2.938167	1.94499	13.6	1.191239	2.662827	1.551009
Mean Dep_{ia}	0.7676389	0.7432938	0.9096370	0.7603437	0.8863609	0.6981674
Mean A_i	2.038397	2.141732	1.5373130	1.92381	1.586957	2.47651
Mean vulnerability	0.3	0.21	0.23	0.44	0.31	0.21
Geography	Dam Doi	Dam Doi	Dam Doi	Dam Doi	Dam Doi	Dam Doi
Primary activity	All primary activities	Fishing - nearshore	Fishing - offshore	Aquaculture - extensive	Aquaculture - intensive	Other activities
Households reporting	220	15	19	77	34	75
Mean monthly income income (million VND)	1.611695	0.563148	2.749855	1.137038	2.548666	1.595623
Mean Dep_{ia}	0.7792823	0.9060063	0.8758246	0.7585357	0.876269	0.7068126
Mean A_i	1.913636	1.333333	1.578947	1.909091	1.5	2.306667
Mean vulnerability	0.39	0.44	0.54	0.54	0.32	0.23
Geography	Tran van Thoi	Tran van Thoi	Tran van Thoi	Tran van Thoi	Tran van Thoi	Tran van Thoi
Primary activity	All primary activities	Fishing - nearshore	Fishing - offshore	Aquaculture - extensive	Aquaculture - intensive	Other activities
Households reporting	179	34	42	45	12	46
Mean monthly income income (million VND)	6.634287	4.804465	2.02	1.221173	2.986281	1.831386
Mean Dep_{ia}	0.8453813	0.8628703	0.9736614	0.82158	0.9149543	0.7204638
Mean A_i	1.871508	1.794118	1.309524	1.711111	1.833333	2.608696
Mean vulnerability	0.28	0.14	0.1	0.64	0.25	0.2
Geography	Hue	Hue	Hue	Hue	Hue	Hue
Primary activity	All primary activities	Fishing - nearshore	Fishing - offshore	Aquaculture - extensive	Aquaculture - intensive	Other activities
Households reporting	200	78	6	88	.	28
Mean monthly income income (million VND)	1.089259	0.964291	1.299451	1.223357	.	0.970888
Mean Dep_{ia}	0.6852518	0.6598799	0.5685391	0.7306115	.	0.6383811
Mean A_i	2.325	2.448718	3	2.045455	.	2.714286
Mean vulnerability	0.21	0.18	0.14	0.25	.	0.17

A simple linear regression was performed to examine the strength of the relationship between vulnerability and average monthly household income per capita. As expected, ANOVA analysis reveals the P-value to be smaller than alpha ($\alpha=0.05$) indicating that the results are statistically significant. Analysis of the residuals shows a non-random pattern (a U-shaped curve) indicating the non-linearity of the vulnerability equation. Both the dependent (vulnerability) and explanatory (monthly income per capita) variables were therefore transformed using a logarithmic function, and a line of best fit was generated by the power method. Coefficient of determination, or R^2 , values which express the goodness of fit of the data to the trendline, are generally higher when data are parsed by primary activity and geographic region with the exception of 'Other' primary activity and Hue where less than 7% and 10% of values fall within the 95% confidence interval. This suggests that experiences of vulnerability as they relate to monthly income per capita are distinct among geographic and primary activity groups, and that for most primary activities, and in Southern Vietnam, vulnerability levels correspond tightly to household income. The lower R^2 values for Hue and for 'Other' primary activities show that observed outcomes for these two groups are not well replicated by the vulnerability/monthly household income per capita model, meaning that the relationship between the two variables is somewhat weaker. Indeed, mean portfolio diversity is greater in these two groups, and mean dependency on the primary activity (as well as overall vulnerability) is lowest. It could be said that for these groups, the value of monthly income per capita carries less weight in household vulnerability than for the other groups. By contrast, the linear regression for nearshore fishing has an R^2 value of 0.915 which means that 91.5% of vulnerability scores for this group are explained by the modeled relationship between vulnerability and income. Linear regressions were also run for vulnerability and portfolio diversity and vulnerability and income dependency. The coefficient of determination values resulting from these regressions are also listed in Table 12 (see Appendices Vd – Vg for simple linear regression scatter plots).

Table 12 Coefficient of determination (R^2) values describing goodness of fit line for a series of linear regressions plotting vulnerability against household monthly income per capita by primary activity and district.

Geography	Primary activity	Coefficient of determination (R^2) for linear regression of vulnerability and total monthly household income per capita	Coefficient of determination (R^2) for linear regression of vulnerability and income dependency	Coefficient of determination (R^2) for linear regression of vulnerability and portfolio diversity
All geographies	All primary activities	0.2221	0.1752	0.144
All geographies	Fishing - nearshore	0.915	0.5617	0.4551
All geographies	Fishing - offshore	0.5433	0.0244	0.059
All geographies	Aquaculture - extensive	0.3266	0.2374	0.1811
All geographies	Aquaculture - intensive	0.4246	0.2923	0.3348
All geographies	Other activities	0.0657	0.27	0.0374
Dam Doi	All primary activities	0.2959	0.2305	0.2116
Tran van Thoi	All primary activities	0.5415	0.0239	0.0195
Hue	All primary activities	0.0936	0.6719	0.424

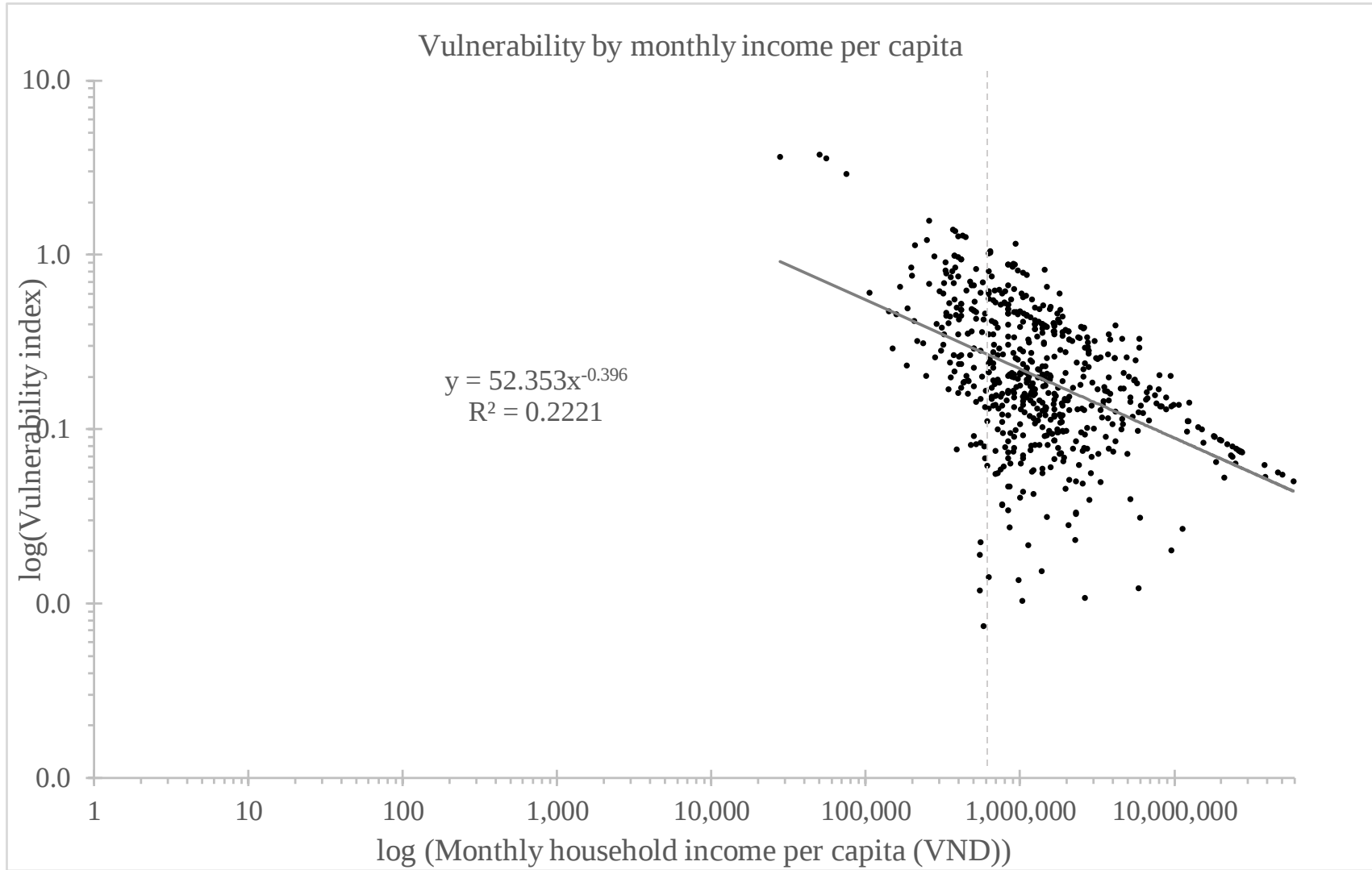


Figure 13 Vulnerability by monthly income per capita. The dashed grey line indicates the 2012 monthly poverty line per capita of 653,000 VND as determined by the World Bank (2013).

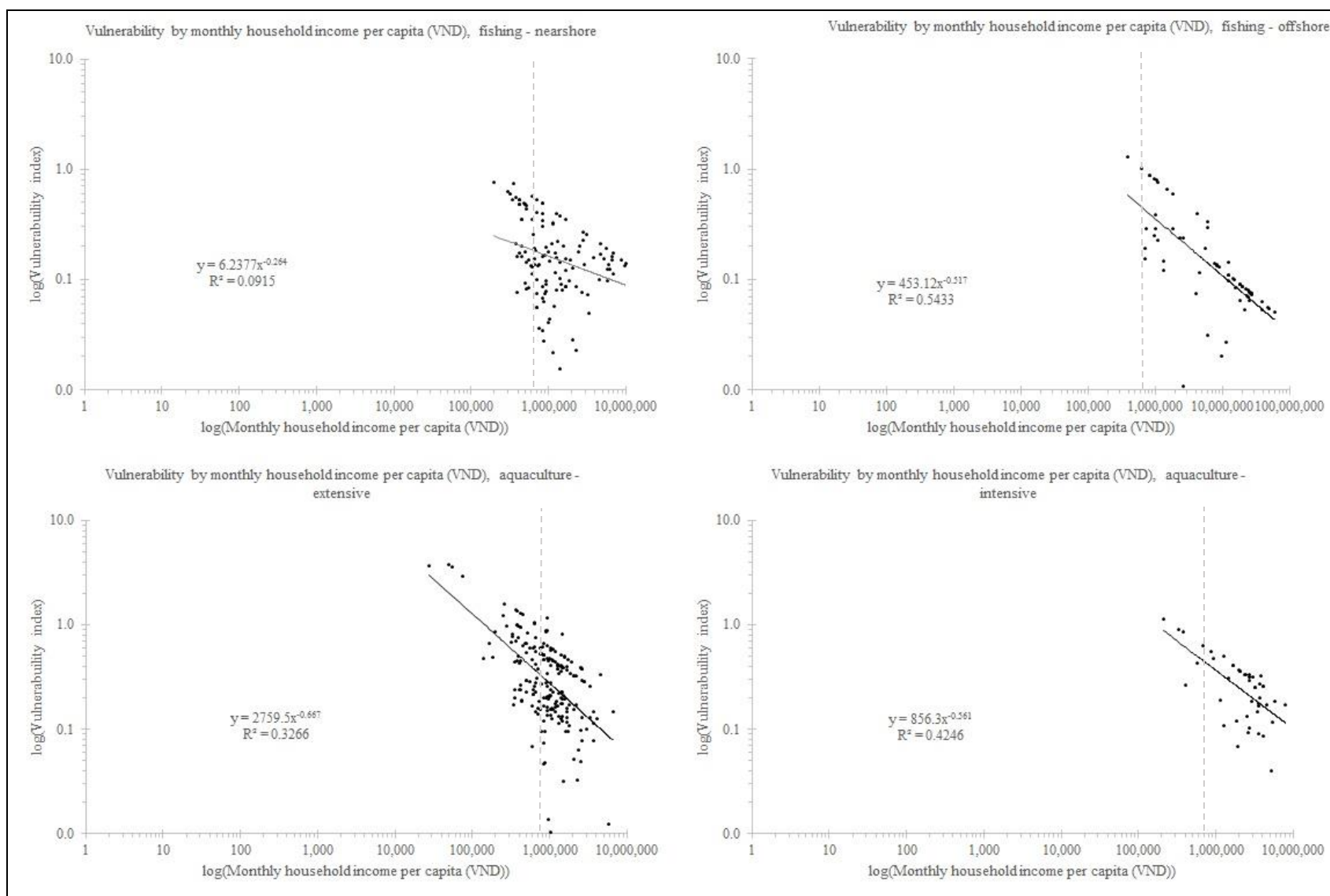


Figure 14 Vulnerability by primary income earning activity, 2012. The dashed grey line indicates the 2012 monthly poverty line per capita of 653,000 VND as determined by the World Bank (2013).

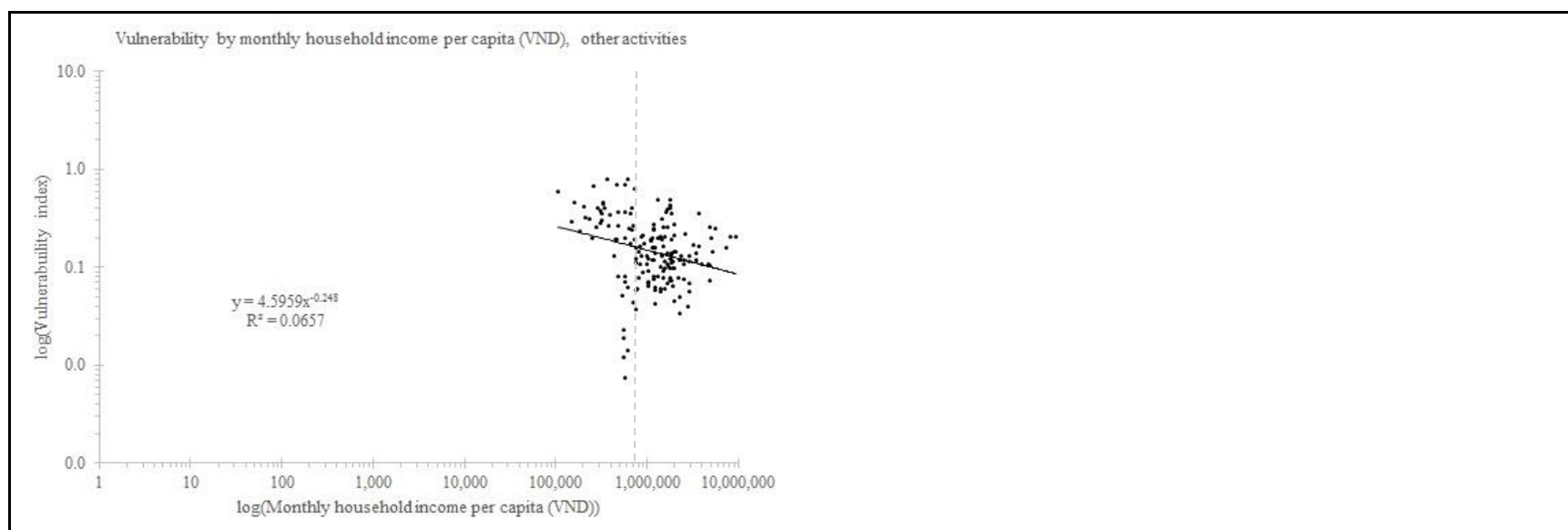


Figure 14 continued Vulnerability by primary income earning activity, 2012. The dashed grey line indicates the 2012 monthly poverty line per capita of 653,000 VND as determined by the World Bank (2013).

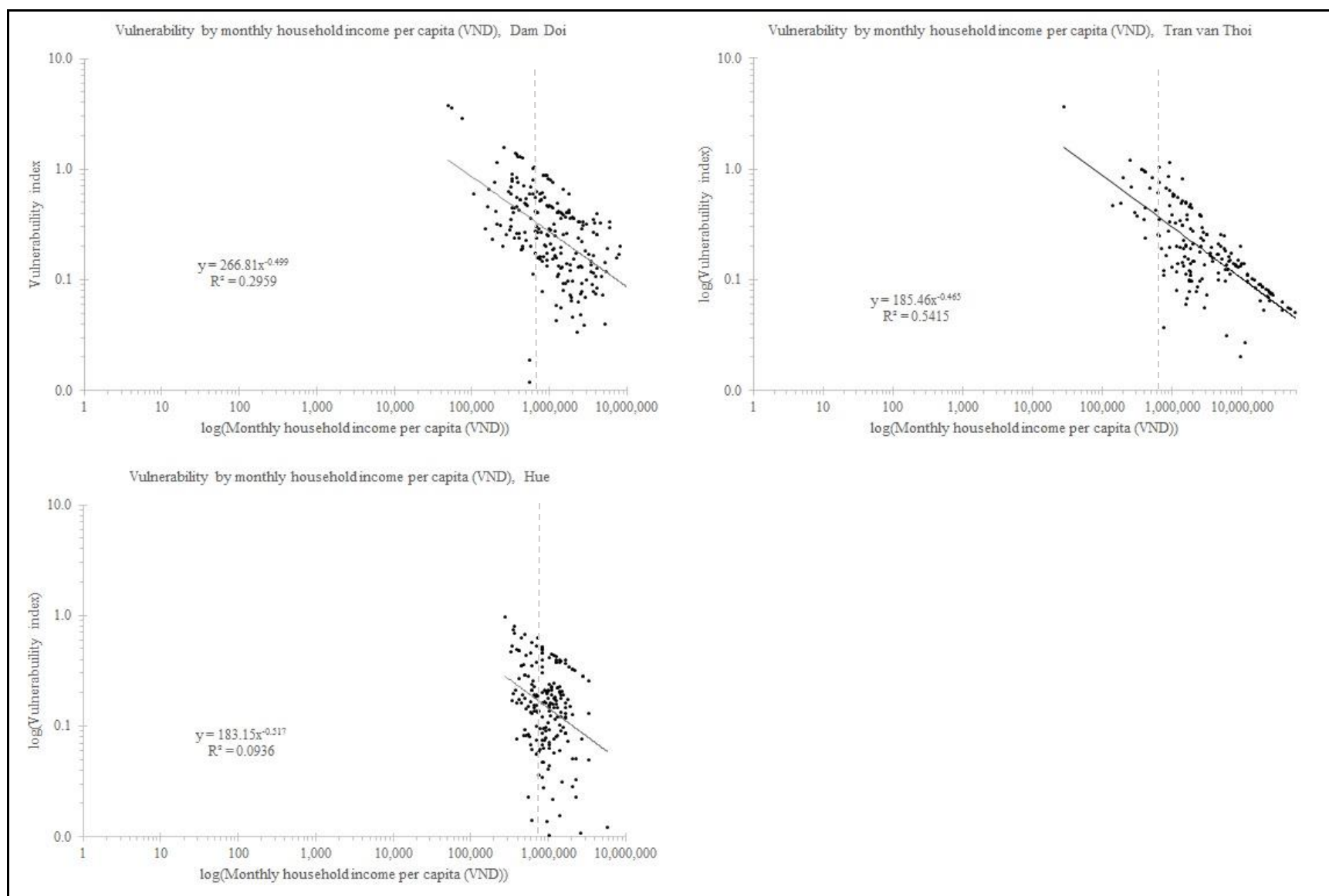


Figure 15 Vulnerability by district, 2012. The dashed grey line indicates the 2012 monthly per capita poverty line of 653,000 VND as determined by the World Bank (2013).

The following table features example calculations demonstrating the effect of the different components of the vulnerability equation on the final index value. Four types of household have been chosen for this illustration: higher income, higher diversity; higher income, lower diversity; lower income, higher diversity; and lower income, lower diversity. For the sake of simplicity the households are selected from the same geographic region in Hue, and the same primary activity group (extensive aquaculture), so that the coefficient of variation (CV_g) is constant for all six examples.

Table 13 Example components of the vulnerability equation with total household income listed in second column and resulting vulnerability score in the final column.

Household identifier (i)	Total 2012 household income (millions of VND)	Coefficient of variation (CV_g)	Diversity factor (A_i)	Proportion of main income source relative to total income (Dep_{ia})	Complement of proportion of main income source multiplied by diversity factor plus one (Div_i)	Square root of monthly poverty line per capita over total monthly income per capita (Pov_i)	Vulnerability
A	29	0.584	3	0.517	0.408	1.375	0.170
B	29	0.584	2	0.690	0.617	0.735	0.183
C	30	0.584	1	1.000	1.000	0.885	0.517
D	150	0.584	1	1.000	1.000	0.560	0.327
E	200	0.584	1	1.000	1.000	0.443	0.258
F	200	0.584	2	0.750	0.667	0.443	0.129

Household A has a low 2012 income (the district average for extensive aquaculture households is 67.55 million VND) and a higher diversity factor. Household B has the same income but a slightly lower diversity factor than household A which results in a slightly higher vulnerability score once the poverty gap factor is taken into account (the average vulnerability score for extensive aquaculture households in Hue is 0.25 and ranges from 0.01 – 0.98). Note that these households, despite having identical incomes, have differing poverty gap factors due to a difference in the number of household members. Household C, which has nearly the same income as A and B and a similar poverty gap factor to household B, has a higher vulnerability score due to a complete lack of diversity in income generating activities. Comparison of these three households reveals the importance of the Dep_{ia}/Div_i ratio, the impact of which is nullified when 1:1. It is also apparent that the number of people in the household influences the poverty gap factor. Household D, which has an annual income five times greater than households A, B, or C is more vulnerable than households A and B due to its low diversity score. Households E and F have the same high income (200 million VND), the same poverty gap factor, and differ only in diversity (household E has a diversity factor of 1 and household F has a diversity factor of 2). As a result, household E is more vulnerable than household F, and is in fact more vulnerable than households A and B which have significantly lower incomes but higher diversity factors.

Poverty headcount ratio and poverty gap

While the poverty headcount ratio shows the number of households below the poverty line, the poverty gap calculation gives an indication of the depth of poverty. Of the 599 households in the sample, 140 live below the poverty line of 653,000 VND. Their average poverty gap is 0.36 (see Appendix VI; see Table 14) and average vulnerability is 0.56 in comparison to 0.23 for the sample as a whole. Given that government and aid institutions focus primarily on statistics for those below the poverty line, the data reported here is limited to those households at below the line. Appendix VI contains poverty gap and vulnerability data for households both at or above and below the line. It is important to note that average vulnerability scores are higher for all household groups at or under the poverty line, particularly for offshore fishing households, than vulnerability scores for those above the poverty line.

Table 14 Poverty headcount ratio, poverty gap, and vulnerability by primary activity and district, 2012. Poverty line set at 653,000 VND as per Kozel,2013.

Geography	Primary activity	Total number of households reporting	Poverty gap for all households below, at, and above poverty line	Poverty headcount ratio - percent of households at or below poverty line (\$653,000 VND monthly per capita)	Number of households at or below poverty line (\$653,000 VND monthly per capita)	Poverty gap for households at or below poverty line (\$653,000 VND monthly per capita)	Vulnerability for households at or below poverty line (\$653,000 VND monthly per capita)
All geography	All sectors	599	-3.436476	23.37%	140	0.3557047	0.5610573
All geography	Fishing as primary activity - near-shore	127	-2.084007	27.56%	35	0.2844381	0.3468128
All geography	Fishing as primary activity - off-shore	67	-18.95549	2.99%	2	0.2183512	1.150547
All geography	Aquaculture as primary activity - extensive	210	-0.8850175	28.10%	59	0.3758502	0.813006
All geography	Aquaculture as primary activity - intensive	46	-3.258633	10.87%	5	0.419772	0.7165096
All geography	Other as primary activity	149	-1.250541	26.17%	39	0.3880154	0.322015
Dam Doi	All sectors	220	-1.603983	30.91%	68	0.4188206	0.6724112
Dam Doi	Fishing as primary activity - near-shore	14	0.1440452	78.57%	11	0.3498667	0.4847627
Dam Doi	Fishing as primary activity - off-shore	19	-3.839604	10.53%	2	0.2183512	1.150547
Dam Doi	Aquaculture as primary activity - extensive	73	-0.8156809	28.77%	21	0.436954	1.041454
Dam Doi	Aquaculture as primary activity - intensive	34	-3.235645	11.76%	4	0.496767	0.7890111
Dam Doi	Other as primary activity	77	-1.376743	35.06%	27	0.4373511	0.3365326
Tran van Thoi	All sectors	179	-8.757549	12.85%	23	0.400366	0.7872172
Tran van Thoi	Fishing as primary activity - near-shore	34	-6.357526	0.00%	0	.	.
Tran van Thoi	Fishing as primary activity - off-shore	42	-28.3507	0.00%	0	.	.
Tran van Thoi	Aquaculture as primary activity - extensive	43	-0.9286438	34.88%	15	0.4119649	0.9186281
Tran van Thoi	Aquaculture as primary activity - intensive	12	-3.323766	8.33%	1	0.1117917	0.4265038
Tran van Thoi	Other as primary activity	49	-1.66959	16.33%	8	0.4186447	0.4125627
Hue	All sectors	200	-0.6898594	24.50%	49	0.2471519	0.3003688
Hue	Fishing as primary activity - near-shore	77	-0.5420219	28.57%	22	0.2503015	0.2748389
Hue	Fishing as primary activity - off-shore	6	-1.056038	0.00%	0	.	.
Hue	Aquaculture as primary activity - extensive	88	-0.9205828	19.32%	17	0.2498769	0.3714305
Hue	Aquaculture as primary activity - intensive	.	.	.	.	.	.
Hue	Other as primary activity	30	-0.4085858	36.67%	11	0.2339557	0.2313842

Nearshore fishing, extensive aquaculture, and ‘Other’ activities share the highest counts of households below the poverty line, but intensive aquaculture households have the largest poverty gap and the greatest vulnerability (vulnerability for extensive aquaculture households is almost equally high). In Dam Doi where the greatest proportion of households below the poverty line is found, the largest primary activity group below the threshold is households involved in ‘Other’ activities, however, intensive aquaculture households have the greatest depth of poverty and offshore fishers below the poverty line have the greatest vulnerability. Tran van Thoi has a lowest poverty head count ratio than any other district as no fishing households fall below the poverty line. ‘Other’ activity households have the greatest poverty gap in the district by a slight margin over extensive aquaculture households, however the extensive aquaculture households below the poverty line have a vulnerability score more than double that of ‘Other’ activities. In Hue a quarter of the households are below the poverty line, but all activity groups appear to experience a similar depth of poverty with gaps between 0.23 – 0.25, and vulnerability scores between 0.23 – 0.37.

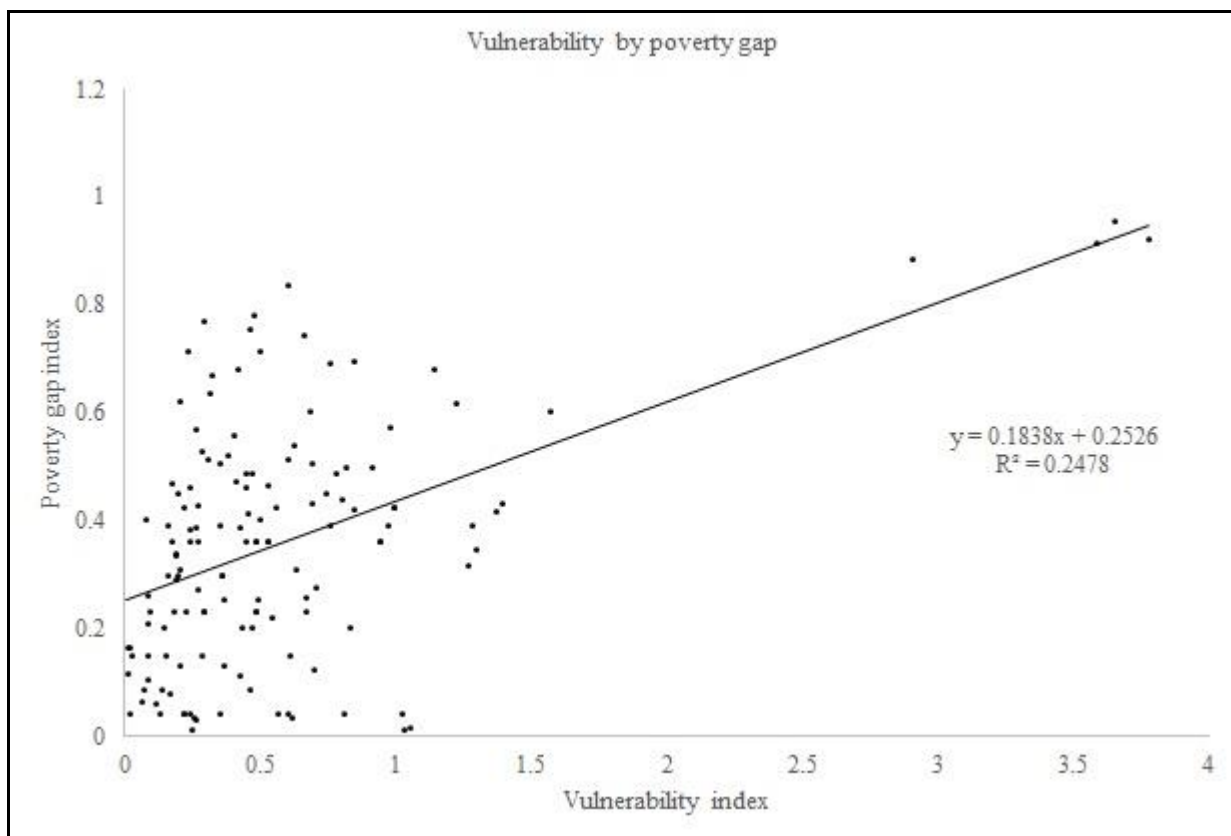


Figure 16 Vulnerability index by poverty gap index, 2012.

A simple linear regression demonstrates the strength of the relationship between the poverty gap and vulnerability. ANOVA analysis reveals the P-value to be smaller than alpha ($\alpha=0.05$), and analysis of the residuals shows a random pattern confirming the linearity of the data. The coefficient of determination value is greatest for extensive aquaculture ($R^2=0.4212$) and lowest in Dam Doi ($R^2=0.1862$). There were too few data points in the offshore fishing and intensive aquaculture groups to merit performing a regression analysis.

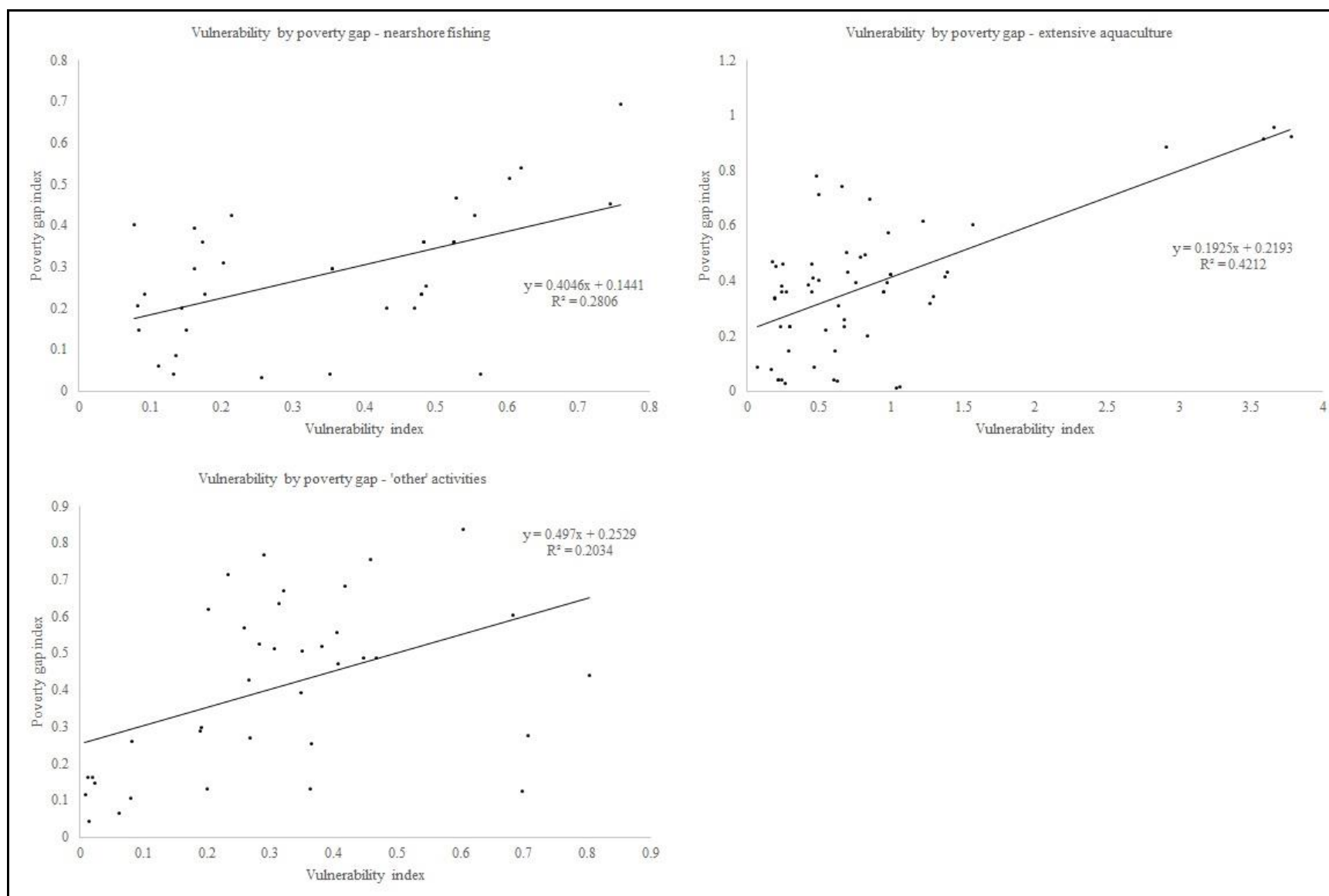


Figure 17 Vulnerability index by poverty gap index by primary income earning activity, 2012

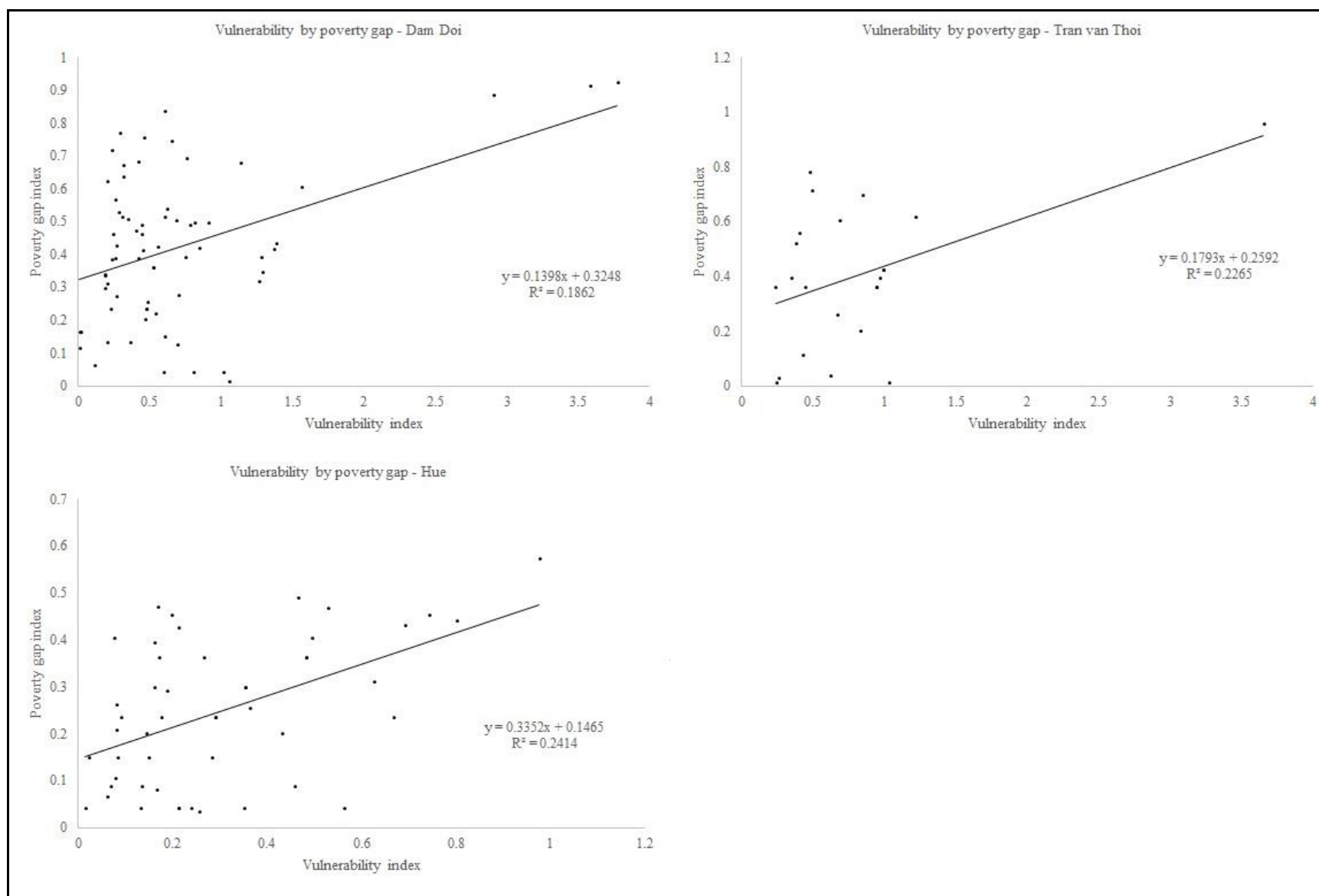


Figure 18 Vulnerability index by poverty gap index by district, 2012.

Vietnam Transition Survey shocks, coping, and perceptions data

Shocks

A total of 509 households reported experience of at least one of fifteen shocks listed in the Vietnam Transitions Survey (see Appendix VII a). Four hundred and eighty-nine of these households then selected three shocks from the list of fifteen to represent the greatest shocks experienced in the year prior to the survey. Disease in fish, food price increase, and input price increase were the three most reported shocks overall.

Of the 450 households reporting some type of aquaculture activity, 278 households report disease in fish among the top three shocks (see Appendix VII b). In terms of households where aquaculture is the primary activity, 36 of the 46 intensive aquaculture households and 124 of the 194 extensive aquaculture households report disease in fish among the top three shocks. An increase in food prices impacted all of the primary activity groups relatively evenly with more than 40% of responding households reporting this shock. In absolute terms, the greatest number of households reporting this shock are in extensive aquaculture, followed by households in the 'Other' primary activity group, the majority of whom also practice some form of aquaculture. Input price increase had the greatest proportional impact on intensive aquaculture households where 76% of households report this top shock. The greatest absolute number of households reporting this shock is the 75 households engaged in extensive aquaculture as their primary activity.

In Dam Doi district, where aquaculture is the most common primary activity, the most reported shock was disease in fish followed by food price increase and input price increase. In Tran van Thoi, where the largest proportion of fishers is found, food price increase and input price increase are the most frequently reported shocks. Diminishing stocks or crops is the third most reported shock with disease in fish a close fourth. In Hue, disease in fish, salinization of ground water and input price increase were the most reported shocks. The effects of salinization in the survey area are in fact visible in Google Maps satellite imagery and many people in the region earn income from mining salt (Marschke, personal communication).

Table 15 Total number and type of shocks reported, 2012.

Geography	All districts	All districts	All districts	All districts	All districts	All districts	Dam Doi	Tran van Thoi	Hue
Primary sector	All primary activities	Fishing as primary activity - near-shore	Fishing as primary activity - off-shore	Aquaculture as primary activity - extensive	Aquaculture as primary activity - intensive	Other as primary activity	All primary activities	All primary activities	All primary activities
Total number of households	599	127	67	210	46	149	220	179	200
Lack of water supply	36	23	1	9	.	3	3	1	32
Salinization in ground water	131	33	4	50	18	26	55	5	71
Disease in fish	296	26	3	134	38	95	144	70	82
Disease in animals/pests in crops	61	1	1	31	9	19	41	18	2
Diminishing stocks/crops	174	79	33	36	2	24	32	75	67
Major storms, climate related events	50	16	13	8	6	7	26	17	7
Reduced price of crop	43	11	1	15	4	12	5	37	1
Reduced price of catch	177	53	28	42	14	40	57	71	49
Food price increase	249	56	27	79	25	62	92	102	55
Input price increase	243	50	23	75	35	60	84	96	63
Serious illness or death in household	68	13	6	27	4	18	19	21	28
Job loss of household member	6	1	1	1	1	2	4	1	1
Displacement	7	4	1	.	.	2	5	2	.
Thief/stealing of fish or shrimp	7	.	.	5	.	2	6	.	1
Cannot access loan	5	.	.	2	.	3	.	.	5

Top shocks

Households ranking the three most significant shocks were asked to describe the impact of these shocks on household income, assets, farmed fish, catch, crops, household savings and food consumption as either increase, decrease, no change or not applicable. Completion of this exercise was inconsistent as some households did not answer this question at all, and others did not evaluate the impact of the shock on all of the impact categories. Values are therefore given in percent of total households describing the impact of a shock on a given impact category such as income or food consumption (detailed responses regarding coping are available in Appendix VIIc).

Impact & coping strategies - Disease in fish

The impact of disease in fish on household income was reported as a decrease by 98% of respondents citing this shock among the top three. Extensive aquaculture and 'Other' income households make up the greatest number of households reporting a decrease in income. By district, Dam Doi had the greatest proportion of households reporting the negative impact of disease in fish on income at 51% of the total, while Tran van Thoi and Hue had 23% and 24% of total responses respectively.

Disease in fish was less likely to have a negative impact on household assets with 78% of households reporting claiming that their assets remained the same despite this being a top shock. Of the households reporting a decrease in assets related to disease in fish, extensive aquaculture and nearshore fishing households claimed the larger share at 9% each of households reporting, and these households were typically located in Dam Doi or Hue.

Over 12% of households reporting say that disease in fish has caused an increase in farmed fish, 75% say it has caused a decrease, and 13% say that there has been no change in farmed fish as a result of disease in fish. Households reporting an increase are primarily in extensive aquaculture and 'Other' primary activities. Of the households reporting the impact of disease and reporting a resulting decrease in farmed fish, 33% are in extensive aquaculture and 22% are in the 'Other' primary activities categories. Across districts the greatest number of households reporting an increase in farmed fish due to disease in fish is in Tran van Thoi (7%) and the greatest proportion of households reporting a decrease is in Dam Doi (42%).

The majority of responding households (88%) state that the impact of disease in fish has not changed catch levels. Six percent report a decrease and 6% report an increase. At 68% of all households reporting any type of response, Hue has the largest group reporting that the impact has not caused a change to catch and also has the greatest number of households reporting a decrease (6%).

With respect to the impact of disease in fish on agricultural crops, 81% reported that crops remained the same, 11% reported a decrease in crops and 8% reported a resulting increase in crops. Households in extensive aquaculture and in the 'Other' primary activity category make up the majority of respondents reporting increase, decrease or lack of change in/to agricultural crops as a result of disease in fish. The greatest proportion of households indicating that the impact of disease in fish is inapplicable to crops is located in Dam Doi (42%).

Eighty-four percent of households reporting claimed their savings decreased as a result of disease

in fish, and 16% claimed no impact to savings. Again, the greatest number of households responding were in extensive aquaculture, followed by households in the 'Other' primary activity group. In Dam Doi, Tran van Thoi, and Hue the majority of households indicate a decrease in savings.

A total of 81% of households reporting the impact of disease in fish on household food consumption as having made no change, and 18% report that their food consumption has decreased as a result. Households in extensive aquaculture and 'Other' primary activities represent the greatest numbers of households reporting no change and reporting a decrease. Hue has the greatest number of households reporting no change in food consumption with 34% of total households reporting, as well as the greatest number of households reporting a decrease in food consumption as a result of disease in fish (7%).

In answer to the shock of disease in fish, the majority of households responding claim to have sought help from relatives and friends (30%) or to increase their fish farming efforts (29%) (see Appendix VII c). The greater part of these households are either extensive aquaculture or 'Other' activity households from Dam Doi. In Tran van Thoi and Hue, households were most likely to increase fish farming efforts in response to the shock of disease in fish.

Impact & coping strategies - Input price increase

Eighty-six percent of households reporting input price increase as a top shock and reporting the impact of this shock on income claim that household income has decreased as a result. The remaining 14% claim that their income has remained the same despite an input price increase. Across primary activity groups 18% of households report a decrease and are nearshore fishers, 7% are offshore fishers, 29% are in extensive aquaculture, 9% in intensive aquaculture and 21% of 'Other' primary activities households reporting this impact also report a decrease in income. Of the households reporting an impact due to input price increase, 34% are in Hue and report a resulting decrease in income, and 39% are in Dam Doi and report a resulting decrease in income.

A majority of households reporting the impact of input price increase on assets (90%) claim their assets have remained the same, while the remaining 10% report their assets have decreased as a result. The 90% reporting no change in assets are evenly distributed across primary activity groups, though the households are primarily concentrated in Dam Doi (33 %) and Tran van Thoi (42%).

A diverse group of impacts on farmed fish were reported in response to input price increase. Twenty-eight percent of households are in near or offshore fishing and report a resulting increase in farmed fish, 33% report a decrease in farmed fish, and 39% report no change in farmed fish as a result of input price increase. Households in extensive aquaculture, intensive aquaculture, and 'Other' primary activities indicating a decrease in farmed fish make up the larger part of households reporting an impact. Extensive aquaculture and 'Other' primary activity households represent the largest groups reporting a resulting increase in farmed fish, and no change in farmed fish. All three categories of impact are represented in Dam Doi and Tran van Thoi, however in Hue households typically reported that there was no impact on farmed fish.

The majority of households reporting indicate that input price increase caused no change in catch (76%). The no change group and the increase group (10%) is primarily composed of nearshore and offshore fishers while the decrease group (14%) is primarily made up of extensive and intensive aquaculture and 'Other' primary activity households. The largest group of households reporting no

change are in Tran van Thoi while the households who responded 'increase' and 'decrease' are mostly in Dam Doi.

A total of 72% of households reporting claim input price increase report their crops have remained the same. Twenty-two percent say there has been a decrease and approximately 6% point to an increase in crops as a result of the shock. The distribution of households reporting this impact across primary activities and districts is unremarkable.

Most households reporting an impact on savings report that input price increase has led to a decrease in household savings (89%). Eleven percent claim their savings levels have remained the same. Households in nearshore and offshore fishing are more likely to report a decrease in savings, and households in Hue report a decrease in savings almost exclusively.

Sixty-five percent of households reporting the impact of input price increase on household food consumption claim that consumption has decreased as a result, while 35% report that household food consumption has stayed the same. These impacts are spread evenly amongst primary activity types and districts.

The most common coping mechanism used to deal with an increase in input price was borrowing money (47%) followed by reduction of aquaculture or fishing scale, capacity or density (12%). Fishers and 'Other' activity households tended to borrow money while aquaculture households were more likely to reduce the scale, capacity or density of their operations.

Impact & coping strategies - Food price increase

All of households reporting the impact of a food price increase (100%) claim the increase led to a decrease in income. A total of 86% of the households are split evenly between nearshore and offshore fishing, and the remaining 14% are in the 'Other' primary activity category. Forty-four percent of the households reporting an impact are from Tran van Thoi, while 33% are from Dam Doi and 19% are from Hue.

Most households report that food price increase did not cause a change to household assets (81%), however the remaining 19% of households report a negative impact on assets. The majority of the households responding are in nearshore or offshore fishing, and the greatest proportion are from Dam Doi (28%). All households from Tran van Thoi report that food price increase caused no change in their household assets.

One hundred percent of households responding claim food price increase caused no change in farmed fish.

A majority (42%) of households responding claim that food price increase did not cause a change to the household's catch, while 34% claimed a decrease in catch, and 24% claimed an increase in catch. The majority of the households reporting an increase, decrease, or no change in catch are offshore or nearshore and offshore fishers, though 15% of the households that responded to this question are in the 'Other' primary activity category. Most respondents who claimed either an increase or a decrease in catch are from Dam Doi. The majority of respondents claiming no change in catch are from Tran van Thoi.

All households responding indicate no change in agricultural crops as a result of food price increase. The majority of responses are from households in near and offshore fishing, and are primarily from Tran van Thoi.

A total of 84% of households reporting indicate that household savings have decreased as a result of food price increase, while 16% report no change. The majority of the households reporting a negative impact on savings are near and offshore fishers which together make up 68% of the total group of responding households. The largest group of responding households claiming no impact on savings are from Dam Doi and represent 12% of the total number of households reporting. The largest group of responding households claiming a decrease in savings are from Tran van Thoi and represent 43% of the total number of households reporting.

Forty-four percent of households reporting indicate that an increase in food prices has led to a decrease in household food consumption, while the remaining 56% indicate no change in consumption. The majority of respondents citing a decrease are in nearshore fishing (25%) with the largest proportion of households reporting no change are in offshore fishing. In Dam Doi and Hue, a greater proportion of respondents claim no change in food consumption than those who claim a decrease, but in Tran van Thoi, more households report a decrease than report no change.

Thirty-six percent of households increased their fishing efforts to cope with the increase of food prices. These were fishing households in Dam Doi, Tran van Thoi and Hue. Households in other activity groups borrowed money, received funds from the government, or ate less, and were located in all three districts.

Perceptions of risk and wellbeing

Generally speaking, most households (75% of households reporting) declare that their standard of living has improved since 2002, and 75% percent of households believe their standard of living is average when compared to others in their village (see Appendix VIIId). Seventy-one percent feel their household's tolerance for risk is average compared to others in the village. Of the households who reported their riskiest household activity, 66% say semi-intensive shrimp culture is the riskiest. Twenty-two percent of households reporting their least risky livelihood activity claim wage work is the least risky, followed by agricultural crops at 21%. Only 17% of households report that they would like to change their main livelihood activity. Most of these households are currently in nearshore fishing, extensive aquaculture, and 'Other' activities. Most households who would like a change would prefer self-employment or aquaculture, but the main obstacle to switching is getting a loan. Land availability and skills also serve as obstacles to change. Intensive aquaculture and offshore fishing households are more frequently satisfied with their current primary activity and rate themselves as having average or better standards of living and risk tolerance when compared to others in their villages.

Discussion

This paper set out to examine different measures of household vulnerability to the shock of a declining fishery and a resulting uncertain economic future. Using data from the VTS survey, the role of the livelihood portfolio in household level vulnerability was examined using vulnerability analysis, poverty analysis, and assessment of the VTS data on shocks, coping, and perception of risk and wellbeing. The following chapter will focus on a summary and discussion of the role of the primary activity groups and the role of geography in the data analysis; the vulnerability of households in Vietnam's southern coastal communities as revealed through the three measures of wellbeing employed; and the similarities and differences between the three approaches in enhancing our understanding of household level vulnerability.

The role of the livelihood portfolio and geography in data analysis

To characterize fishers as the 'poorest of the poor' is to ignore the great diversity in scale and income that fishers (and fish farmers for that matter) experience the world over. In Vietnam's coastal communities, fishing and fish farming are an important source of food, and an essential part of the economy. The fact that Vietnam is the world's fourth largest exporter of fish but has a fleet mostly operated by small-scale hints at the complexity of the fishing labour force.

In order to more clearly understand the dynamics of households engaged in the fisheries sector the sample was first divided between those primarily earning their income from fishing from those primarily earning their incomes from aquaculture. Fishers engage in fewer income generating activities because fishing requires active participation away from the household, whereas (depending on scale of course) aquaculture can be practiced more easily as an adjunct activity. Aquaculture requires land and water availability and some type of reliable tenure or usage rights whereas fishing does not. Both aquaculture and fishing generate higher incomes at greater scale and intensity, though they face a different set of shocks. Whereas disease in fish may have little to no impact on a fisher, an aquaculturalist may have their entire operation fail due to a regional disease cycle, while fishers must contend with long-term boom-bust cycles inherent to fish populations and ocean ecology. A second division between near and offshore fishers and extensive and intensive necessarily groups the households by scale and intensity. Nearshore fishers operate smaller vessels with less technical gear and fish less lucrative species. Offshore operators operate larger vessels with more technical high efficiency gear, and fish high value species which typically generates a higher income than their nearshore counterparts. Extensive aquaculturalists engage in minimal maintenance and use minimal inputs in their operations. Lower input results in lower output and therefore lower income. Intensive aquaculture requires higher inputs (value is measured by the feed conversion ratio) and generates higher value species. This is at a much greater expense than extensive aquaculture, but the practice can be lucrative and is actively encouraged by the Vietnamese government.

The appropriateness of the decision to parse the households by this primary income generating activity scheme is supported by the decrease in standard deviation in average household income when the households are categorized (see Appendix IIa). Offshore fishing is by far the most lucrative of activities, generating an average 645.44 million VND per household which is five times greater than the overall average income of 147 million VND. Intensive aquaculture earns nearly the sample average at 146.65 while its poorer cousin earns the lowest of all the group's average incomes at 65.14 million VND. Both nearshore fishers and those engaging in either wage work, farming, self-employment, and/or other

activities find themselves below the sample average at 93.92 million VND and 86.6 million VND per year.

This pattern of wealth distribution among primary activity groups holds throughout the survey data. The wealthiest households are in offshore fishing, they catch lucrative species, they have more assets, they report fewer shocks, and unsurprisingly, they indicate no desire to change activities. Intensive aquaculture practitioners are much the same but on a lower scale, they mostly engage in aquaculture, they farm more lucrative species using more expensive equipment and have more assets than the other three primary activity groups, and they report a similar number of shocks to the offshore households and mirror the intention to stay with their current livelihood activities. Nearshore fishing households, extensive aquaculture households, and 'Other' activity households frequently engage in multiple income generating activities, catch or farm lower value species with less technological gear than offshore fishers and intensive aquaculturalists, have fewer assets, and suffer the greatest proportion of shocks. Overwhelmingly the primary activity of choice for all three groups is intensive aquaculture which is interesting given that it is not the highest income generating activity. For all 5 groups, the coping technique of choice when facing any type of shock is to obtain extra money, whether through a government program, borrowing from family or friends, take a loan, or draw on savings. While most households would prefer to borrow money outside the family, the ability to qualify for a loan was seen as a major barrier to improving household circumstances.

When the data are parsed geographically, we again see a number of different stories. Rather than a tale of southern coastal Vietnam, we expose the plight of fishers and fish farmers in Hue, the rich fishing grounds breeding success for offshore fishers in Tran Van Thoi, and the difficult circumstances faced by nearshore fishers in Dam Doi. In Hue the top three livelihood shocks were unique in that they included salinization and diminishing stock/crops. This region of Vietnam has a unique climate characterized by alternating heavy rainfall and flooding with hot dry periods. Whereas the other two districts are located in the Mekong Delta, Hue is located on the maritime side of a range of mountains stretching north-south. The Tam Giang, Dong and Cau Hai lagoons in Hue are a major source of income for families in the area, and Tam Giang is an operational test site for government initiatives in fisheries co-management. Due to the hydrodynamics of the river and ocean systems as well as the low elevation of the coastal lands, the dry season causes salt water intrusion such that freshwater sources become contaminated and the salinity of the river system increases and extends a greater distance upstream (Ministry of Natural Resources and Environment (MNRE), 2008). Climate change related drought is a real concern for households in Hue and affects households directly in terms of monsoon activity and flooding as well as agricultural production in the region. On the other side of the spectrum is the wealth of Tran van Thoi's offshore fishing households. The secret to their success lies in a warmer, relatively shallow ocean ecology sheltered by the Gulf of Thailand, and a central port of trade deep enough to accommodate large fishing vessels. In stark contrast there is a group of 11 nearshore fishing households in one commune in Dam Doi that earn the lowest average income of any other nearshore sub group in the sample at 25 million VND, and a group of extensive aquaculturalists earning the lowest average income of all extensive aquaculture sub groups. Dam Doi is a district at the terminal end of the alluvial floodplain of the Mekong Delta which means that coastal waters are too shallow for offshore fishing vessels. In Dam Doi we see the lowest average income levels in the sample, almost no offshore fishers, and the highest number of households practicing extensive aquaculture regardless of their primary activity.

Without these subsets of data, the total sample tells a watered-down version of the story of these households. The wealth of the few masks the hardships and challenges faced by the many, and this holds true through the vulnerability analysis as well.

Assessing the vulnerability of households in southern coastal Vietnam

Vulnerability

Two summary measures of household's wellbeing were calculated using VTS income data. The first involved adapting an equation developed by Christophe Béné to determine the economic vulnerability of households for whom adequate cross-sectional data are missing. Typically income measures involve examining variations over time, but as Béné points out, populations who suffer vulnerability the greatest are frequently the ones for whom there is the least data. For this reason he attempts to use variability among households as a proxy for variability over time. Using a series of situation-specific parameters, the households are grouped, and then their incomes evaluated according to the proportion of their dependence on the main source of income, the proportion and diversity of non-primary sourced income, the amount of subsistence activities undertaken by the household, and the relationship of the household income to the poverty line. This method stresses the importance of diversity in a household's livelihood portfolio and its relationship to income and is useful when evaluating vulnerability in communities where households' efforts lie mostly in the primary sector, and where they are subject to a variety of natural and economic shocks.

Adjustments were made to the vulnerability equation to accommodate a difference in data collected by Béné and the VTS. Specifically, respondents in the VTS survey were not asked to distinguish which, if any, of their activities were for subsistence only. This means there is no data for the $\sqrt{Sub_i + 1}$ term in

the equation. Interviews and follow-up surveys to the VTS as well as government documents indicate that fishing and aquaculture activities are highly unlikely to support subsistence and are almost exclusively sent to market due to their relatively high value (MNRE, 2008). Agriculture and agroforestry activities may be subsistence activities in whole or in part, but this information was not a part of the survey design. Since removing the subsistence term from the equation altogether caused the portfolio diversity factor (the denominator in the equation) to have a value of zero, $\sqrt{Sub_i + 1}$ was replaced with a constant of 1.

Generally speaking the vulnerability results conformed to observed differences in wellbeing along primary activity and geographical lines of inquiry, but with some exceptions. Offshore fishing households were the least vulnerable overall with the exception of households that made substantially less than the average annual income of their counterparts. Given that offshore fishing households were least likely to engage in multiple income generating activities it would seem that there is a particular threshold in the calculation where the size of a household's income overshadows the need for portfolio diversity, in that a household's sensitivity to shocks is mitigated by the increased adaptive capacity that results from a high household income. Overall, extensive aquaculture households are the most vulnerable, with the most vulnerable sub group in the entire sample located in Tran van Thoi. While it is tempting to assume that higher vulnerability scores in extensive aquaculture are related to the trend in low incomes across that primary income group, the relationship between income and vulnerability is not linear as evidenced in the simple regressions in the results chapter of this essay, and vulnerability scores such as those in Dam Doi. Nearshore fishing households in Dam Doi have half the average income of extensive aquaculture households, higher average dependency on the primary source of income, and lower average portfolio diversity, yet even though they are vulnerable, they are less vulnerable than the extensive aquaculture households. Offshore fishing households in Dam Doi have more than twice the average monthly income per capita as extensive aquaculture households, greater dependency, lower diversity, and rank the same in

vulnerability. One visible trend is the portfolio diversity among households primarily engaged in ‘Other’ activities such as farming, wage labour, self-employment and other activities. These households have the highest diversity rankings and the lowest dependency scores of all the primary activity groups, and the average vulnerability for these households tends to be on the low side.

Vulnerability, as calculated using this equation, does not generate results that easily enable the researcher to declare a practical line of action in the real world. The vulnerability index is more so a guide to understanding potential differences between groups that merit further investigation. To say that portfolio diversity is the prime factor in assessing vulnerability would be jumping the gun as the relationship between the factors in the equation are as yet unclear. While portfolio diversity seems beneficial to lower income households in terms of insulating against shocks, there seems to be a point where it is more beneficial to focus one’s efforts on the most profitable income generating activity. More testing/modeling should be done to confirm the dynamics of the component parts, perhaps through factor analysis or multiple regression.

Poverty analysis

Basic poverty analysis demonstrates the outcome of measuring household wellbeing using a much simpler equation. In poverty analysis the only factor involved is income (be it at the household, community, or state level). The poverty gap was calculated for the VTS data using a recent World Bank estimate of the rural poverty line in Vietnam. The most severe poverty is seen in a small number of intensive aquaculture households which could be linked to an outbreak of disease that caused many Vietnamese aquaculturalist’s shrimp crops to fail in 2012. Extensive aquaculture and ‘Other’ activities are the two primary activities where the gap is greatest, and this is most severe in Dam Doi. The correlation factor between the poverty gap and vulnerability for those households below the poverty line is 0.4978, and average vulnerability scores are higher for all household groups at or under the poverty line, particularly for offshore fishing households, than vulnerability scores for those above the poverty line.

There are some instances where household groups have a lower poverty gap than others but are substantially more vulnerable, as is the case with the primary activity group offshore fishing, and the district of Tran van Thoi. These are examples of the benefit which arises from the comparison of poverty and vulnerability index values. A straight poverty analysis shows that very few offshore fishing households fall below the poverty line, and Tran van Thoi where the most prosperous of these are located has a similar poverty gap to Dam Doi, and has primary activity groups which are all similar to one another in terms of poverty gap. Using the vulnerability index to tease out the nuances reveals that offshore fishers in Dam Doi and extensive aquaculture households in Tran van Thoi may be more sensitive to shocks than their peer groups than income data alone suggests. But what happened to these households remains obscured without further information. Further, what of the households whose income lies above the poverty gap? Some 459 households have been excluded from the analysis, albeit purposefully, yet are still vulnerable. In the case of Tran van Thoi extensive aquaculture households living above the poverty line, vulnerability scores are higher than for any group in Hue below the poverty line.

While it is true that groups above the poverty line score lower on the vulnerability index than their counterparts below the line, they may score higher than those with lower incomes, and they are not necessarily less vulnerable than other households. This is extremely relevant to the way governments allocate funding for development. Recently in Canadian news media it was reported that Oxfam, a highly visible development organization, would not be allowed to keep its charitable organization status for

Canadian tax purposes unless it removed the concept of poverty prevention from its mission statement which was "...to prevent and relieve poverty, vulnerability and suffering by improving the conditions of individuals whose lives, livelihood, security or well-being are at risk" (The Canadian Press, July 25th 2014). The concerns of the Canada Revenue Agency were that "preventing poverty could mean providing for a class of beneficiaries that are not poor" (The Canadian Press, July 25th 2014). This is a frustrating example of the kind of thinking that puts households either above or below an arbitrary line, dismissing the demonstrated vulnerability of those above.

Evidently there is a relationship between the poverty gap and vulnerability as the poverty gap features in the vulnerability equation. It's tempting to assume that decreasing poverty will decrease vulnerability, but the vulnerability equation demonstrates that this relationship is not necessarily linear. An important question to ask is whether households are poor because they are vulnerable, or are they vulnerable because they are poor? Or rather, to ask whether there is a problem of endogeneity in the comparison of vulnerability and poverty indices. The moderate correlation between the two demonstrates that there may be an issue of simultaneity occurring, making it worthwhile to run tests for endogeneity before applying the equation to real-life situations.

Shocks, coping and perceptions

Data assessing the quantity and type of shocks experienced at the household level does not, as such, describe the intensity of the shocks, nor does it quantify a household's sensitivity, but it does explain the 'what' of the problem faced by vulnerable households and households near or below the poverty line. The 'what' of the problem is often left out of research on poverty and vulnerability, or is answered unsatisfactorily by income data. The vulnerability and poverty data show that VTS households in extensive aquaculture are the most sensitive, and have the least income-related adaptive capacity, but the VTS data on shocks, coping and perception show that these extensive aquaculture households have experienced disease outbreaks compounded by increasing input and food prices that have had the overall effect of decreasing household income. Sadly the inventory of coping techniques households use to adapt to these shocks involves reducing the amount of food consumed for many households. When household members cannot feed themselves due to environmental and/or economic pressures, what is technically a coping mechanism, according to the VTS, may be better labeled as an involuntary outcome.

It appears the trifecta of disease in fish, and food and input price increase may be at the root of most household poverty/vulnerability and caused negative impacts on incomes, savings and farm fish produced, and this holds for those most vulnerable extensive aquaculture households in Tran van Thoi. But what of the offshore fishers in Dam Doi? They report that they have experienced a reduced price of catch, an increase in food price, and major storms or climate related events and are reporting a decrease in income and savings and increased fishing efforts. The importance of these observations is that one set of interventions, however tailored they may be to the types of shocks experienced by the majority of groups, cannot fit all. Generalizing about solutions for households in the fisheries sector, inclusive of fishing and aquaculture, is inefficient. Generalizing about solutions at a national scale and ignoring regional differences is equally inefficient.

Data on coping is relatively sparse in comparison to the data on shocks as mentioned in the results section so it is difficult to assess their reliability. Generally speaking the most common technique for coping with shocks is to acquire more money through friends and relatives, government assistance, drawing down on savings, or borrowing money. Alternatively, households increased fishing or fish farming efforts, reduced aquaculture or fishing scale/capacity, ate less, or switched to using wild

stock/seed in their aquaculture production. Aside from the obvious benefits to having more income, it appears households alternatives are to either work harder, get out of the business, eat less, or eschew commercial aquaculture products for environmentally unsustainable wild ones. These last two are less than ideal as alternatives, and exiting the household’s traditional business is not always a viable option if few other economic possibilities exist. There was a 97% response rate to the question asking “Would you like to change your main livelihood activity from what you do now?” to which 17% responded “yes.” Six different main obstacles to change were proposed and 67% of households responding stated that the main obstacle to switching to the household’s preferred activity was access to a loan. To access lending capital households need capital to leverage which makes borrowing money through ‘legitimate’ means difficult for households already coping with poverty or vulnerability. With no way to improve the outcome of the current livelihood portfolio, and no way to change the portfolio’s composition, many households in the fisheries sector are stuck in a cycle of vulnerability.

Similarities and differences between approaches

The vulnerability index and poverty gap index are summary measures of wellbeing using income data while the VTS data on shocks, coping and perceptions data are a subjective inventory of the household experience that provides insight into the details of shocks encountered, household resourcefulness and ability to cope. The following table summarizes the three approaches.

Table 16 Differences between the Béné vulnerability index, the poverty gap index, and VTS quantitative perceptions approaches.

<i>Béné vulnerability index</i>	<i>Poverty gap index</i>	<i>VTS shocks, coping and perceptions data</i>

Core Advantages	• A focus on economic vulnerability makes it a good adjunct to poverty analysis. • Use of portfolio diversity and income dependency reveals dynamics of risk that are not revealed in poverty analysis and which can be applied to households regardless of their position relative to the poverty line and is inclusive of households at risk of poverty who are equally in need of consideration. • Can be used to extrapolate and assess risk in other population groups with like characteristics.	• Simple calculation with information that is normally readily available. • Establishes a norm via the poverty line allowing the comparison of households relative to a pre-determined benchmark. • Can be used to extrapolate and assess risk in other population groups with like characteristics.	• Unlike vulnerability and poverty analysis which are summary measures of wellbeing, this line of inquiry identifies the causes of income (and other) stressors, as well as household's adaptive capacity and their coping strategies. • This level of detail enables region-specific issues to be identified, and also challenges assumptions about household coping techniques. • Can be used to extrapolate and assess risk in other population groups with like characteristics.
Main Limitations	• Not being truly cross-sectional, the vulnerability index represents a snapshot of household circumstances. Variation across households is somewhat captured by grouping like households, but the method used for grouping is prone to bias. • Snapshot data may or may not capture the effects of temporal or cyclic stressors so that patterns of poverty are evident for a particular group only, or for none of the groups. In this sense the lack of longitudinal data is not mitigated by accounting for variation across household groups.	• Establishment of poverty line is arbitrary. • Focus on income ignores the multidimensional aspects of the experience of poverty such as deficits in education opportunities and food insecurity. • Income measures may be too simplistic. For example, one may have an income above the poverty line but be servicing a debt that puts ones disposable income below the benchmark.	• This type of data are not frequently collected as it is time and labour intensive. • While the perceptions data are quantified, it nonetheless measures perceptions which are subjective. • These data do not express the degree to which shocks are or are not experienced at the household level.

Differences	i.	Highlights economic vulnerability using a snapshot of household income data. Vulnerability is mitigated by income levels, the capacity for livelihood portfolio diversification and extent to which the household depends on its primary source of income.	i.	Discerns a portion of a population that lives below a determined standard of living and expresses the distance between the populations' income and the target income.	i.	Provides insight into the diverse nature of shocks to occur at the household and community level in a given period of time, as well as the individual household's method of coping with shocks. Incorporates information regarding income, but also captures resources that are not measured in dollars.
	ii.	Quantitative data, universally applicable.	ii.	Quantitative data, universally applicable.	ii.	Perceptions data quantified. Descriptive. Rarely collected.
	iii.	Households are grouped based on informed understanding of sample based on researchers understanding of economic potential and opportunity.	iii.	Households are grouped based on informed understanding of sample based on researchers understanding of economic potential and opportunity.	iii.	Households are grouped based on informed understanding of sample based on researchers understanding of economic potential and opportunity.
	iv.	Results can be used to evaluate household or community sensitivity and economic coping ability.	iv.	Results can be used to identify economically vulnerable groups, and the extent of the income shortfall they experience.	iv.	Results can be used to identify household or community sensitivity and economic coping ability.
	v.	Objective input can be used to infer the degree of vulnerability of a household or community and identify populations at risk.	v.	Mix of objective input (income data) and subjective positioning of the poverty line (changes according to the methods chosen to calculate it) which can be used to identify some vulnerable populations.	v.	Subjective input can be used to extrapolate outcomes when exposure is at varying levels, and to inform the creation of appropriate interventions

There are some issues with all three lines of inquiry. As noted by Béné, cross-sectional data reflects only the conditions experienced by the survey respondents in a particular moment of time, and that the variability across households is a stand-in for the variability across time that would be captured by longitudinal data (2009). The VTS survey faces the same issue. An attempt was made to cover a time span of ten years by having respondents reflect on answers for both 2012 and 2002. Unfortunately some

of the recall data was unreliable which was likely due to difficulty recalling numeric values for variables such as income from ten years past, and may also have been due to interviewer's skill limitations. Availability of cross-sectional income data at a state level are usually available where community level data are not. This is the reason for the prevalence of measuring poverty using the poverty gap, and the reason (intentionally or unintentionally) poverty is often interpreted as a stand-in for vulnerability.

Another concern is the use of the coefficient of variation of income for groups of households in the Béné calculation. According to Béné this method masks income variability related to factors outside of the reasons for grouping households together but which are not exclusive to the vulnerability index. It is also important to note that using data which represents a snapshot in time may or may not capture the income effect of shocks which are not necessarily applicable to all income groups as these shocks may or may not be detectable at the time of the snapshot. Given that shocks may be periodic and varying in length and severity, capturing their impacts is best done in a longitudinal study, the vulnerability index would be extremely useful if its measure were taken over time.

It is crucial in all analysis to devise salient groupings of subjects when creating sample subgroupings, and poverty and vulnerability analyses can certainly be improved by examining issues at the household level, and grouping households appropriately. Further analysis of the VTS data could investigate different subgroupings of the data, for example, households grouped by common experiences of shocks, by the area of land held by each household, or by the species fished/farmed. Further, influences on income variability could be examined by testing vulnerability according to household size, occupant age distribution, and the highest level of education achieved by a household member.

Béné also notes that his index focuses exclusively on income vulnerability when there are numerous other potential sources of vulnerability, such as exposure to health risks, or fish diseases and climate change in the case of the fisheries sector. This concern resonates strongly with critiques of poverty analysis which employs even fewer dimensions in the calculation of household wellbeing. A major strength of the VTS survey is that it provides income data and allows for the identification and quantification of shocks so that the definition of exposure can vary from household to household.

Harkening back to Fussel's model of vulnerability frameworks which classifies vulnerability problems by scale and disciplinary domain, classification of the VTS vulnerability problem by these measures is not helpful since the risk factors faced by households are both internal (able to be controlled/influenced by the households) and external (not under the control of households) and that the disciplinary domain includes environmental, social and economic elements. The vulnerability experienced by survey households crosses these boundaries, and the diversity of the indicators available in the data set enables a more appropriate multidimensional analysis. One might assume that other vulnerability problems would have fewer dimensions (say for example risk/hazard assessments of vulnerability in earthquake prone regions) and that these models would therefore involve fewer assumptions and conditional parameters than the VTS vulnerability problem. It is therefore fortuitous that our multidimensional vulnerability problem and the VTS shocks, risks and coping data provide complementary perspectives which, when put together, offer a fuller vision of the precarious economic situation faced by Vietnam's coastal communities.

One final concern with respect to the VTS survey is that respondents experienced questionnaire fatigue during the shocks, risks and coping sections which is made obvious in the dataset by the declining response rate at that stage. This had the unfortunate consequence of limiting the ability to compare results between groups of respondents and groups of variables. This is an issue with the survey and interviewer

skill and possibly questionnaire design rather than an issue with the approach to vulnerability itself, but should be noted all the same.

The vulnerability index suggests that households whose main source of income is extensive aquaculture are the most vulnerable of all groups across all geographies (though not necessarily the most impoverished) and the VTS vulnerability data suggests that disease in fish – a shock particular to the aquaculture environment – was the most frequent and impactful shock among the entire sample. We can thus extrapolate that those households for whom aquaculture was a secondary income generator, the impact of disease in fish was somewhat softened. This goes to support the incorporation of the portfolio diversity and income dependency factors in the vulnerability equation by Béné. The portfolio diversity factor also influences the overall picture in relation to the sample's more affluent aquaculture households – those in intensive aquaculture. Despite having a higher average income than most nearshore fishing, extensive aquaculture, and 'Other' activity households, intensive aquaculture households scored relatively high on the index due to a lack of diversity in their livelihood portfolio. However, when asked, these households are the least likely of all to want to change their main livelihood activity when by comparison other households in nearshore fishing, extensive aquaculture and the 'Other' activity households would prefer to move into aquaculture or intensify their aquaculture activities for their main livelihood activity.

Conclusion

Policy action in Vietnam is encouraging engagement in intensive aquaculture activities, however, given the capital and investment required to enter this livelihood activity it is little wonder most households reporting a desire to shift to intensive aquaculture cite the inability to acquire a loan as a major obstacle to making a change. This set of observations is an example of the kind of insight that can inform policy decisions. In this case, characterizing the government support of a transition from nearshore fisheries and extensive aquaculture to intensive aquaculture as an effective pro-poor endeavor is misleading. The transition, as it were, is inclusive of the poor only to the extent that households are able to buy in. Further, governments should question the wisdom of encouraging lower income households to focus on a livelihood which is very susceptible to disease when their ability to recover from such a shock is limited by their ability to cover their losses.

References

- Adger, W. N., & Kelly, P. M. (1999). Social vulnerability to climate change and the architecture of entitlements. *Mitigation and Adaptation Strategies for Global Change*, 4(3-4), 253-266.
- Adger, W. N., & Vincent, K. (2005). Uncertainty in adaptive capacity. *Comptes Rendus - Geoscience*, 337(4), 399-410. doi:10.1016/j.crte.2004.11.004
- Ahmed, M., & Lorica, M. H. (2002). Improving developing country food security through aquaculture development—lessons from Asia. *Food Policy*, 27(2), 125-141. doi:10.1016/S0306-9192(02)00007-6
- Allison, E. H. (2011). *Aquaculture, fisheries, poverty and food security*. World Fish Center.
- Anh, P. T., Bush, S. R., Mol, A. P. J., & Kroeze, C. (2011). The multi-level environmental governance of Vietnamese aquaculture: Global certification, national standards, local cooperatives. *Journal of Environmental Policy & Planning*, 13(4), 373-397. doi:10.1080/1523908X.2011.633701
- Arthur, R. I., & Friend, R. M. (2011). Inland capture fisheries in the Mekong and their place and potential within food-led regional development. *Global Environmental Change*, 21(1), 219-226. doi:10.1016/j.gloenvcha.2010.07.014
- Barrett, C. B. (2010). Measuring food insecurity. *Science*, 327(5967), 825-828. doi: 10.2307/40509899
- Belton, B., & Thilstead, S. (2013). Fisheries in transition: FoHaod and nutrition security implications for the Global South. *Global Food Security*, doi: 10.1016/j.gfs.2013.10.001
- Béné, C. (2009). Are fishers poor or vulnerable? Assessing economic vulnerability in small-scale fishing communities. *The Journal of Development Studies*, 45(6), 911-933. doi:10.1080/00220380902807395
- Bianchi, G., Fletcher, R. (2011). Western Central Pacific in *Review of the state of world marine fishery resources*. FAO Fisheries and Aquaculture. Rome.
- Birkman, J. (2006). *Measuring vulnerability to natural hazards: Towards disaster resilient societies*. Tokyo; New York: United Nations University Press.
- Chappell, M., & LaValle, L. (2011). Food security and biodiversity: Can we have both? An agroecological analysis. *Agriculture and Human Values*, 28(1), 3-26. doi: 10.1007/s10460-009-9251-4
- Cinner, J. E., McClanahan, T. R., Graham, N. A. J., Daw, T. M., Maina, J., Stead, S. M., Bodin, Ö. (2012). Vulnerability of coastal communities to key impacts of climate change on coral reef fisheries. Elsevier. doi:10.1016/j.gloenvcha.2011.09.018 [Wrong citation, journal, volume, number, pages?]

Climate change impacts in Huong River Basin and adaptation in its Coastal District Phu Vang, Thua Thien Hue province. (2008). Institute of Meteorological, Hydrological and Environment: Ministry of Natural Resources and Environment, Vietnam.

Duncan, K., & Brebbia, C. A. (2009). Disaster management and human health risk: Reducing risk, improving outcomes. *International Conference on Disaster Management and Human Health*, New Forest, England. , 1(1) 1-392.

FishstatJ. Food and Agriculture Organization of the United Nations. Rome. Accessed 11/11/2013

Füssel, H. (2005). Vulnerability in climate change research: A comprehensive conceptual framework. Breslauer Symposium Number Six, University of California. , Paper 6

Godfray, H. C. J., Beddington, J. R., Crute, I. R., Haddad, L., Lawrence, D., Muir, J. F., Toulmin, C. (2010). Food security: The challenge of feeding 9 billion people. *Science*, 327(5967), 812-818. doi: 10.2307/40509896

Ha, T. T. P., & van Dijk, H. (2013). *Fishery livelihoods and (non-)compliance with fishery regulations—A case study in Ca Mau Province, Mekong Delta, Viet Nam*. Elsevier. doi:10.1016/j.marpol.2012.06.021

Ha, T. T. P., van Dijk, H., Bosma, R., & Sinh, L. X. (2013). Livelihood capabilities and pathways of shrimp farmers in the Mekong Delta. *Aquaculture Economics & Management*, 17(1), 1-30. doi:10.1080/13657305.2013.747224

Hampshire, K. R., Panter-Brick, C., Kilpatrick, K., & Casiday, R. E. (2009). Saving lives, preserving livelihoods: Understanding risk, decision-making and child health in a food crisis. *Social Science & Medicine*, 68(4), 758-765. doi:10.1016/j.socscimed.2008.11.014

Haughton, J., Khandker, S.R. (2009). *Handbook on poverty and inequality*. Washington, DC: The World Bank.

Hoff, L. (2001). *People in crisis: Clinical and public health perspectives*. San Francisco, CA: Jossey-Bass.

Human Development Index. United Nations Development Programme. Accessed 01/08/2014

Kozel, V. (2014). *Well begun but not yet done: Progress and emerging challenges for poverty reduction in Vietnam*. World Bank. doi.org110.1596/978-1-4648-0006-1

Langan, J. (2005). *Preparing nurses for disaster management*. Upper Saddle River, N.J: Pearson Prentice Hall.

Marschke, M. Betcherman, G. Vietnam's Seafood Boom: Economic growth with impoverishment? *Draft*

paper.

- McCarthy, J., Canziani, O., Leary, N., Dokken, D., & White, K. (2001). Climate change 2001: Impacts, adaptation and vulnerability. (Assessment Report No. 3). Intergovernmental Panel on Climate Change.
- McClanahan, T., Allison, E. H., & Cinner, J. E. (2013). Managing fisheries for human and food security. *Fish and Fisheries*, 14(3), 1467-2979. doi:10.1111/faf.12045
- McClanahan, T. R., Cinner, J. E., Maina, J. J., Graham, N. J., Daw, T. M., Stead, S. M., & Polunin, N. C. (2008). Conservation action in a changing climate. *Conservation Letters*, 1(2), 53-59. doi:10.1111/j.1755-263X.2008.00008.x
- McGregor, D., Dodman, D., & Barker, D. (2009). *Global change and Caribbean vulnerability: Environment, economy and society at risk*. Kingston, Jamaica: University of the West Indies Press.
- Moser, C. O. N. (1998). The asset vulnerability framework: Reassessing urban poverty reduction strategies. *World Development*, 26(1), 1-19. doi:10.1016/S0305-750X(97)10015-8
- Muir, J. (2013). Fish, feeds, and food security. *Animal Frontiers*, 3(1), 28-34. doi: 10.2527/af.2013-0005
- Natale, F., Hofherr, J., Fiore, G., & Virtanen, J. (2013). Interactions between aquaculture and fisheries. *Marine Policy*, 38, 205-213. doi:10.1016/j.marpol.2012.05.037
- Ocampo, J. A., Martin, J. (2003). *Globalization and development: A Latin American and Caribbean perspective*. The World Bank. doi:10.1596/0-8213-5501-5
- Pauly, D., Christensen, V., Dalsgaard, J., Froese, R., & Torres Jr., F. (1998). Fishing down marine food webs. *Science*, 279(5352), 860-863.
- Pelling, M. (2003). *The vulnerability of cities: Natural disasters and social resilience*. Sterling, VA: Earthscan Publications.
- Pomeroy, R., Thi Nguyen, K. A., & Thong, H. X. (2009). Small-scale marine fisheries policy in Vietnam. *Marine Policy*, 33(2), 419-428. doi:10.1016/j.marpol.2008.10.001
- Raakjaer, J., Manh Son, D., Staehr, K., Hovgard, H., Dieu Thuy, N. T., Ellegaard, K., Giang Hai, P. (2007). Adaptive fisheries management in Vietnam. *Marine Policy*, 31(2), 143-152.
- Result of the Household Livings Standards Survey 2012*. (2012). General Statistics Office of Vietnam (GSO).
- Schiller, Bradley R. 2008. The economics of poverty and discrimination. Upper Saddle River, NJ:

Prentice Hall.

Schipper, E., & Burton, I. (Eds.). (2009). *The Earthscan reader on adaptation to climate change*. London: Earthscan.

Scholtens, J., & Badjeck, M. (2010). Dollars, work and food: Understanding dependency on the fisheries and aquaculture sector. *Economics of Fish Resources and Aquatic Ecosystems: Balancing Uses, Balancing Costs*, Le Corum Montpellier, France. , IIFET 2010

Sen, Amartya. (1976). Poverty: An ordinal approach to measurement. *Econometrica*, 44(2), 219-231

Siddharthan, N., & Narayanan, K. (2013). *Human capital and Development: The Indian experience*. India: Springer India.

Smit, B., Wandel, J., Hovelsrud, G. (Eds.) (2008). *Community adaptation and vulnerability in Arctic regions: Framework document for an international polar year consortium*. Guelph, Ont.: University of Guelph.

Smith, J., Klein, R. J., Huq, S., & Potsdam-Institut für Klimafolgenforschung. (2003). *Climate change, adaptive capacity and development*. London, River Edge, NJ: Imperial College Press.

Sobiech, C. (2013). *Agent-based simulation of vulnerability dynamics: A case study of the German North Sea Coast*. Heidelberg: Springer.

The state of world fisheries and aquaculture. (2012). FAO Fisheries and Aquaculture Department. Rome: Food and Agriculture Organization of the United Nations.

Tacon, A. G. J., Metian, M., Turchini, G. M., & De Silva, S. S. (2009). Responsible aquaculture and trophic level implications to global fish supply. *Reviews in Fisheries Science*, 18(1), 94-105. doi:10.1080/10641260903325680

The Canadian Press. (2014,07 25). 'Preventing poverty' not a valid goal for tax purposes, CRA tells Oxfam Canada. *CBC News*. Retrieved from <http://www.cbc.ca/news/politics/preventing-poverty-not-a-valid-goal-for-tax-purposes-cra-tells-oxfam-canada-1.2717774>

Van den Berg, R., & Feinstein, O. (2009). *Evaluating climate change and development*. New Brunswick, N.J: Transaction Publishers.

Vietnam Fisheries and Aquaculture Sector Study: Final report. Ministry of Fisheries and The World Bank. February 16, 2005.

Vietnam Fisheries Transition Survey. (2012).

Watson, R., Cheung, W., Anticamara, J., Sumaila, R., Zeller, D., and Pauly, D. 2013. Global marine yield halved as fishing intensity redoubles. *Fish and Fisheries*, 14: 493-503.

Appendices

Appendix Ia Primary activity analysis – Cumulative table of boat size

Boat size class	Freq.	Percent	Cum.
Total	173	100	.
average hp per boat = 0	23	13.29	13.29
average hp per boat>0 and <=5	2	1.16	14.45
average hp per boat>5 and <=10	10	5.78	20.23
average hp per boat>10 and <=15	35	20.23	40.46
average hp per boat>15 and <=20	5	2.89	43.35
average hp per boat>20 and <=25	31	17.92	61.27
average hp per boat>25 and <=30	3	1.73	63.01
average hp per boat>30 and <=35	.	.	.
average hp per boat>35 and <=40	2	1.16	64.16
average hp per boat>40 and <=45	1	0.58	64.74
average hp per boat>45 and <=50	.	.	.
average hp per boat>50 and <=55	2	1.16	65.9
average hp per boat>55 and <=60	1	0.58	66.47
average hp per boat>60 and <=65	1	0.58	67.05
average hp per boat>65 and <=70	1	0.58	67.63
average hp per boat>70 and <=75	.	.	.
average hp per boat>75 and <=80	.	.	.
average hp per boat>80 and <=85	.	.	.
average hp per boat>85 and <=90	5	2.89	70.52
average hp per boat>90 and <=95	.	.	.
average hp per boat>95 and <=100	.	.	.
average hp per boat>100 and <=150	8	4.62	75.14
average hp per boat>150 and <=200	8	4.62	79.77
average hp per boat>200 and <=250	17	9.83	89.6
average hp per boat>250 and <=300	5	2.89	92.49
average hp per boat>300 and <=400	9	5.2	97.69
average hp per boat>400 and <=500	4	2.31	100

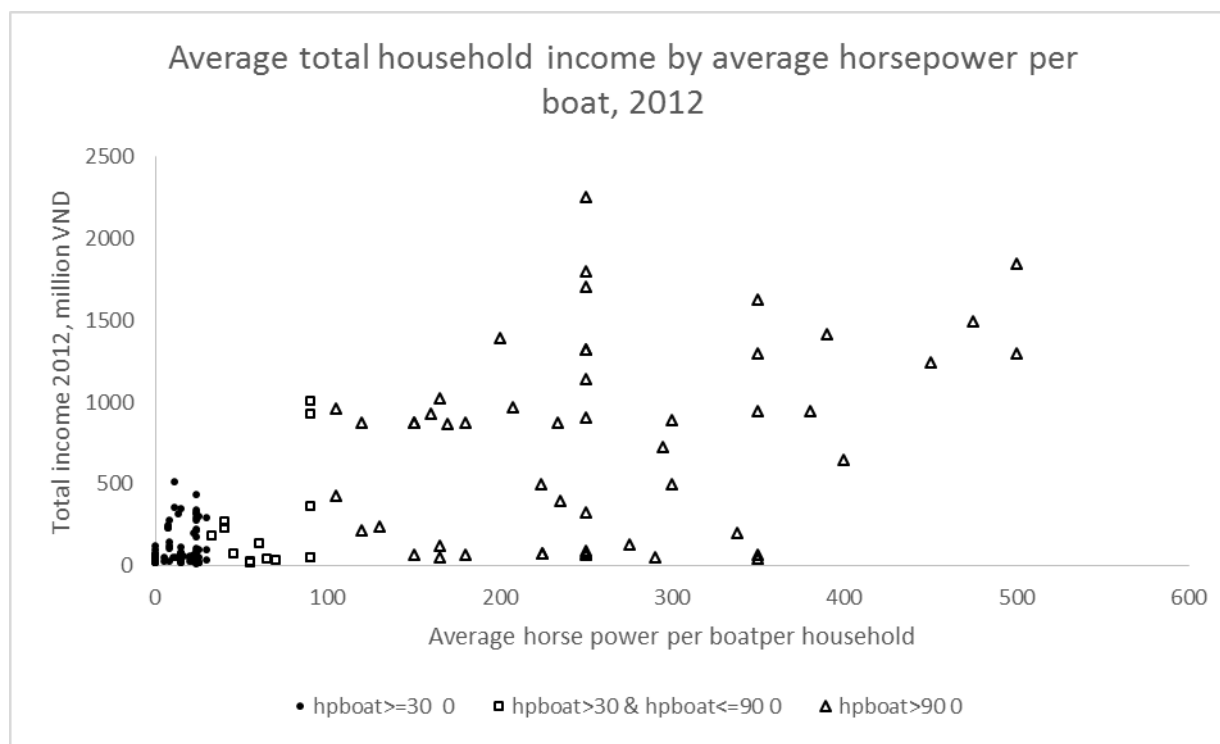
Appendix Ib

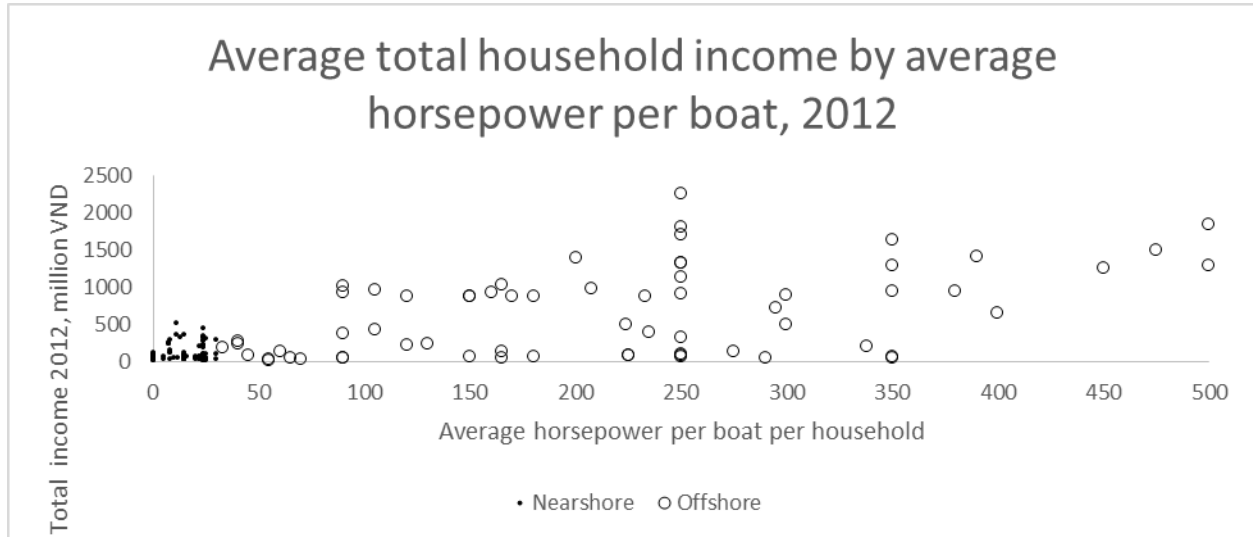
Primary activity analysis – Table of average boat size by nearshore and offshore primary activities

		Nearshore fishing	Offshore fishing
Average hp per boat>=30	Count	112	0
	Average income	97.571	.
Average hp per boat>30 & <=90	Count	0	14
	Average income	.	246.101
Average hp per boat>90	Count	0	51
	Average income	.	768.858
Missing hp per boat	Count	15	2
	Average income	66.63	293.5

Appendix Ic

Primary activity analysis – Graph of average boat size by near, mid or offshore capacity





Appendix IIa

Household data analysis – Mean income by primary activity and district

Geography	Primary sector	Income	Count	Mean income (million VND)	Standard deviation	Mean proportion of income
All districts	All sectors	Total income	599	147.75	269.96	1
All districts	All sectors	Fishing income	250	210.33	394.55	0.69
All districts	All sectors	Aquaculture income	450	44.43	50.51	0.57
All districts	All sectors	Other income	376	42.35	50.29	0.46
All districts	Fishing as primary activity - near-shore	Total income	127	93.92	98.67	1
All districts	Fishing as primary activity - near-shore	Fishing income	127	75.36	95.87	0.74
All districts	Fishing as primary activity - near-shore	Aquaculture income	52	16.41	12.41	0.28
All districts	Fishing as primary activity - near-shore	Other income	68	22.12	15.07	0.27
All districts	Fishing as primary activity - off-shore	Total income	67	645.44	572.34	1
All districts	Fishing as primary activity - off-shore	Fishing income	67	625.25	573.58	0.91
All districts	Fishing as primary activity - off-shore	Aquaculture income	10	31.13	17.28	0.22
All districts	Fishing as primary activity - off-shore	Other income	20	52.07	37.25	0.19
All districts	Aquaculture as primary activity - extensive	Total income	210	65.14	50.74	1
All districts	Aquaculture as primary activity - extensive	Fishing income	32	17.18	16.27	0.28
All districts	Aquaculture as primary activity - extensive	Aquaculture income	210	48.29	39.4	0.76
All districts	Aquaculture as primary activity - extensive	Other income	117	25.53	23.22	0.35
All districts	Aquaculture as primary activity - intensive	Total income	46	146.65	89.7	1
All districts	Aquaculture as primary activity - intensive	Fishing income	0	.	.	0
All districts	Aquaculture as primary activity - intensive	Aquaculture income	46	128.85	84.63	0.89
All districts	Aquaculture as primary activity - intensive	Other income	22	37.23	27.35	0.24
All districts	Other as primary activity	Total income	149	86.6	77.2	1
All districts	Other as primary activity	Fishing income	24	23.76	14.32	0.3
All districts	Other as primary activity	Aquaculture income	132	20.93	17.84	0.29
All districts	Other as primary activity	Other income	149	64.24	68.47	0.7

Geography	Primary sector	Income	Count	Mean income (million VND)	Standard deviation	Mean proportion of income
Dam Doi	All sectors	Total income	220	89.34	86.88	1
Dam Doi	All sectors	Fishing income	50	65.49	104.81	0.67
Dam Doi	All sectors	Aquaculture income	185	49.82	56.35	0.59
Dam Doi	All sectors	Other income	141	50.82	57.75	0.54
Dam Doi	Fishing as primary activity - near-shore	Total income	15	30.6	16.52	1
Dam Doi	Fishing as primary activity - near-shore	Fishing income	15	26.2	12.41	0.91
Dam Doi	Fishing as primary activity - near-shore	Aquaculture income	2	13.5	1.27	0.33
Dam Doi	Fishing as primary activity - near-shore	Other income	2	19.5	14.85	0.37
Dam Doi	Fishing as primary activity - off-shore	Total income	19	155.44	151.58	1
Dam Doi	Fishing as primary activity - off-shore	Fishing income	19	137.28	143.8	0.88
Dam Doi	Fishing as primary activity - off-shore	Aquaculture income	3	50	20	0.27
Dam Doi	Fishing as primary activity - off-shore	Other income	5	39.01	36.58	0.31
Dam Doi	Aquaculture as primary activity - extensive	Total income	77	64.56	54.27	1
Dam Doi	Aquaculture as primary activity - extensive	Fishing income	8	6.75	3.85	0.18
Dam Doi	Aquaculture as primary activity - extensive	Aquaculture income	77	47.14	42.27	0.76
Dam Doi	Aquaculture as primary activity - extensive	Other income	45	28.62	24.82	0.38
Dam Doi	Aquaculture as primary activity - intensive	Total income	34	136.94	85.25	1
Dam Doi	Aquaculture as primary activity - intensive	Fishing income	0	.	.	0
Dam Doi	Aquaculture as primary activity - intensive	Aquaculture income	34	117.68	78.4	0.88
Dam Doi	Aquaculture as primary activity - intensive	Other income	14	46.79	29.39	0.3
Dam Doi	Other as primary activity	Total income	75	88.21	83.25	1
Dam Doi	Other as primary activity	Fishing income	8	27.38	22.48	0.23
Dam Doi	Other as primary activity	Aquaculture income	69	20.41	19.32	0.29
Dam Doi	Other as primary activity	Other income	75	66.51	71.61	0.71
Tran van Thoi	All sectors	Total income	179	315.27	440.02	1
Tran van Thoi	All sectors	Fishing income	80	571.79	536.97	0.89

Geography	Primary sector	Income	Count	Mean income (million VND)	Standard deviation	Mean proportion of income
Tran van Thoi	All sectors	Aquaculture income	101	50.73	62.29	0.59
Tran van Thoi	All sectors	Other income	116	47.99	58.46	0.41
Tran van Thoi	Fishing as primary activity - near-shore	Total income	34	215.56	120.96	1
Tran van Thoi	Fishing as primary activity - near-shore	Fishing income	34	194.21	121.12	0.86
Tran van Thoi	Fishing as primary activity - near-shore	Aquaculture income	0	.	.	0
Tran van Thoi	Fishing as primary activity - near-shore	Other income	26	27.92	17.41	0.18
Tran van Thoi	Fishing as primary activity - off-shore	Total income	42	946.7	516.93	1
Tran van Thoi	Fishing as primary activity - off-shore	Fishing income	42	929.12	515.76	0.97
Tran van Thoi	Fishing as primary activity - off-shore	Aquaculture income	2	30.63	0.88	0.08
Tran van Thoi	Fishing as primary activity - off-shore	Other income	11	61.55	29.36	0.09
Tran van Thoi	Aquaculture as primary activity - extensive	Total income	45	61.38	65.22	1
Tran van Thoi	Aquaculture as primary activity - extensive	Fishing income	0	.	.	0
Tran van Thoi	Aquaculture as primary activity - extensive	Aquaculture income	45	49.18	46.17	0.82
Tran van Thoi	Aquaculture as primary activity - extensive	Other income	25	21.96	30.88	0.32
Tran van Thoi	Aquaculture as primary activity - intensive	Total income	12	174.15	100	1
Tran van Thoi	Aquaculture as primary activity - intensive	Fishing income	0	.	.	0
Tran van Thoi	Aquaculture as primary activity - intensive	Aquaculture income	12	160.48	96.88	0.91
Tran van Thoi	Aquaculture as primary activity - intensive	Other income	8	20.5	11.74	0.13
Tran van Thoi	Other as primary activity	Total income	46	97.64	85.23	1
Tran van Thoi	Other as primary activity	Fishing income	4	29.29	10.84	0.28
Tran van Thoi	Other as primary activity	Aquaculture income	42	21.98	16.26	0.28
Tran van Thoi	Other as primary activity	Other income	46	75.03	79.43	0.72
Hue	All sectors	Total income	200	62.05	33.37	1
Hue	All sectors	Fishing income	120	29.7	15.51	0.55

Geography	Primary sector	Income	Count	Mean income (million VND)	Standard deviation	Mean proportion of income
Hue	All sectors	Aquaculture income	164	34.49	30.09	0.52
Hue	All sectors	Other income	119	26.81	19.75	0.41
Hue	Fishing as primary activity - near-shore	Total income	78	53.07	24.61	1
Hue	Fishing as primary activity - near-shore	Fishing income	78	33	14.13	0.66
Hue	Fishing as primary activity - near-shore	Aquaculture income	50	16.52	12.64	0.28
Hue	Fishing as primary activity - near-shore	Other income	40	18.48	12.4	0.32
Hue	Fishing as primary activity - off-shore	Total income	6	88.23	51.68	1
Hue	Fishing as primary activity - off-shore	Fishing income	6	43.33	12.11	0.57
Hue	Fishing as primary activity - off-shore	Aquaculture income	5	20	7.07	0.24
Hue	Fishing as primary activity - off-shore	Other income	4	42.34	58.21	0.35
Hue	Aquaculture as primary activity - extensive	Total income	88	67.55	38.04	1
Hue	Aquaculture as primary activity - extensive	Fishing income	24	20.66	17.38	0.31
Hue	Aquaculture as primary activity - extensive	Aquaculture income	88	48.85	32.99	0.73
Hue	Aquaculture as primary activity - extensive	Other income	47	24.47	15.98	0.35
Hue	Aquaculture as primary activity - intensive	Total income	0	.	.	0
Hue	Aquaculture as primary activity - intensive	Fishing income	0	.	.	0
Hue	Aquaculture as primary activity - intensive	Aquaculture income	0	.	.	0
Hue	Aquaculture as primary activity - intensive	Other income	0	.	.	0
Hue	Other as primary activity	Total income	28	64.17	28.86	1
Hue	Other as primary activity	Fishing income	12	19.5	5.9	0.34
Hue	Other as primary activity	Aquaculture income	21	20.51	16.44	0.29
Hue	Other as primary activity	Other income	28	40.43	18.18	0.64

Appendix IIb

Household data analysis – Breakdown of mean contributing parts for ‘Other’ activity income

Geography	Primary sector	Total number of households	Count	Farm income	Wage income	Self-employment income	Other income
All districts	All sectors	599	376	14.3366	31.1853	59.1393	12.0294
All districts	Fishing as primary activity - near-shore	127	68	20.2072	13.3908	17.25	9.375
All districts	Fishing as primary activity - off-shore	67	20	32.3333	36.119	70	12.0294
All districts	Aquaculture as primary activity - extensive	210	117	11.8	23.1667	23.3477	15.75
All districts	Aquaculture as primary activity - intensive	46	22	14.1111	32	48.5714	.
All districts	Other as primary activity	149	149	12.1048	42.8692	89.7963	11.7574
Dam Doi	All sectors	220	141	10.5063	38.9269	68.3889	12.3382
Dam Doi	Fishing as primary activity - near-shore	15	2	10	9		20
Dam Doi	Fishing as primary activity - off-shore	19	5	32.3333	17.6667	40	12.0294
Dam Doi	Aquaculture as primary activity - extensive	77	45	10.7308	29.2	27.8667	7
Dam Doi	Aquaculture as primary activity - intensive	34	14	15	35.625	48.5714	
Dam Doi	Other as primary activity	75	75	8.93478	47.325	95.1667	11.6667
Tran van Thoi	All sectors	179	116	19.1811	40.187	111.625	.
Tran van Thoi	Fishing as primary activity - near-shore	34	26	27.6	6	30	.
Tran van Thoi	Fishing as primary activity - off-shore	42	11	32.3333	63.3333	100	.
Tran van Thoi	Aquaculture as primary activity - extensive	45	25	12.1	27.7273	2	.
Tran van Thoi	Aquaculture as primary activity - intensive	12	8	13.8571	22.3333	39.975	.
Tran van Thoi	Other as primary activity	46	46	16.7314	42.7909	129.5	.
Hue	All sectors	200	119	9.48095	18.8179	25.658	11.8971
Hue	Fishing as primary activity - near-shore	78	40	4.33333	13.7181	15.8333	7.85714
Hue	Fishing as primary activity - off-shore	6	4	32.3333	13.75	70	12.0294
Hue	Aquaculture as primary activity - extensive	88	47	13.0111	16.8395	20.7679	17.5
Hue	Aquaculture as primary activity - intensive	.	.	.	.	.	.
Hue	Other as primary activity	28	28	7	33.1111	36.6667	12.0294

Appendix IIc

Household data analysis – Highest level of education achieved by a household member by primary activity and district

Geography	Primary sector	Highest level of education achieved by a household member - households reporting	Highest level of education achieved by a household member - none	Highest level of education achieved by a household member - primary	Highest level of education achieved by a household member - secondary	Highest level of education achieved by a household member - post-secondary
All districts	All sectors	599	0	71	387	141
All districts	Fishing as primary activity - near-shore	127	0	36	78	13
All districts	Fishing as primary activity - off-shore	67	0	5	52	10
All districts	Aquaculture as primary activity - extensive	210	0	17	136	57
All districts	Aquaculture as primary activity - intensive	46	0	1	33	12
All districts	Other as primary activity	149	0	12	88	49
Dam Doi	All sectors	220	0	13	149	58
Dam Doi	Fishing as primary activity - near-shore	15	0	5	10	0
Dam Doi	Fishing as primary activity - off-shore	19	0	3	14	2
Dam Doi	Aquaculture as primary activity - extensive	77	0	2	52	23
Dam Doi	Aquaculture as primary activity - intensive	34	0	1	24	9
Dam Doi	Other as primary activity	75	0	2	49	24
Tran van Thoi	All sectors	179	0	19	123	37
Tran van Thoi	Fishing as primary activity - near-shore	34	0	12	21	1
Tran van Thoi	Fishing as primary activity - off-shore	42	0	2	32	8
Tran van Thoi	Aquaculture as primary activity - extensive	45	0	0	37	8
Tran van Thoi	Aquaculture as primary activity - intensive	12	0	0	9	3
Tran van Thoi	Other as primary activity	46	0	5	24	17
Hue	All sectors	200	0	39	115	46
Hue	Fishing as primary activity - near-shore	78	0	19	47	12
Hue	Fishing as primary activity - off-shore	6	0	0	6	0
Hue	Aquaculture as primary activity - extensive	88	0	15	47	26
Hue	Aquaculture as primary activity - intensive	.	.	.	.	.
Hue	Other as primary activity	28	0	5	15	8

Appendix II d

Household data analysis – Average assets per household by primary activity and district

Geography	Primary sector	Total number of households	Assets - households reporting	Average assets per household
All districts	All sectors	599	599	6.036728
All districts	Fishing as primary activity - near-shore	127	127	5.007874
All districts	Fishing as primary activity - off-shore	67	67	7.507463
All districts	Aquaculture as primary activity - extensive	210	210	5.938095
All districts	Aquaculture as primary activity - intensive	46	46	7.543478
All districts	Other as primary activity	149	149	5.926175
Dam Doi	All sectors	220	220	5.968182
Dam Doi	Fishing as primary activity - near-shore	15	15	4.333333
Dam Doi	Fishing as primary activity - off-shore	19	19	5.210526
Dam Doi	Aquaculture as primary activity - extensive	77	77	5.87013
Dam Doi	Aquaculture as primary activity - intensive	34	34	7.676471
Dam Doi	Other as primary activity	75	75	5.813334
Tran van Thoi	All sectors	179	179	6.536313
Tran van Thoi	Fishing as primary activity - near-shore	34	34	4.617647
Tran van Thoi	Fishing as primary activity - off-shore	42	42	8.690476
Tran van Thoi	Aquaculture as primary activity - extensive	45	45	6.022222
Tran van Thoi	Aquaculture as primary activity - intensive	12	12	7.166667
Tran van Thoi	Other as primary activity	46	46	6.326087
Hue	All sectors	200	200	5.665
Hue	Fishing as primary activity - near-shore	78	78	5.307693
Hue	Fishing as primary activity - off-shore	6	6	6.5
Hue	Aquaculture as primary activity - extensive	88	88	5.954545
Hue	Aquaculture as primary activity - intensive	.	.	.
Hue	Other as primary activity	28	28	5.571429

* Assets

include car, motorbike, motorboat, rowboat, cellphone, television, stereo, machine pump, computer, fridge, freezer, air conditioner, washing machine, electric cooker, gas cooker, water heater, microwave

Appendix IIe

Household data analysis – Household ownership by primary activity by district

Geography	Primary sector	Total number of households	House ownership - households reporting count	House ownership - yes	House ownership - no
All districts	All sectors	599	596	583	13
All districts	Fishing as primary activity - near-shore	127	126	121	5
All districts	Fishing as primary activity - off-shore	67	66	64	2
All districts	Aquaculture as primary activity - extensive	210	210	207	3
All districts	Aquaculture as primary activity - intensive	46	46	46	0
All districts	Other as primary activity	149	148	145	3
Dam Doi	All sectors	220	219	216	3
Dam Doi	Fishing as primary activity - near-shore	15	15	15	0
Dam Doi	Fishing as primary activity - off-shore	19	18	17	1
Dam Doi	Aquaculture as primary activity - extensive	77	77	76	1
Dam Doi	Aquaculture as primary activity - intensive	34	34	34	0
Dam Doi	Other as primary activity	75	75	74	1
Tran van Thoi	All sectors	179	179	172	7
Tran van Thoi	Fishing as primary activity - near-shore	34	34	30	4
Tran van Thoi	Fishing as primary activity - off-shore	42	42	41	1
Tran van Thoi	Aquaculture as primary activity - extensive	45	45	45	0
Tran van Thoi	Aquaculture as primary activity - intensive	12	12	12	0
Tran van Thoi	Other as primary activity	46	46	44	2
Hue	All sectors	200	198	195	3
Hue	Fishing as primary activity - near-shore	78	77	76	1
Hue	Fishing as primary activity - off-shore	6	6	6	0
Hue	Aquaculture as primary activity - extensive	88	88	86	2
Hue	Aquaculture as primary activity - intensive	.	.	.	.
Hue	Other as primary activity	28	27	27	0

Appendix II

Household data analysis – Type of house by primary activity by district

Geography	Primary sector	Total number of households	Main residence - households reporting	Main residence - Permanent - concrete	Main residence - semi-permanent - brick, tin roof	Main residence - Temporary - thatch
All districts	All sectors	599	589	196	259	134
All districts	Fishing as primary activity - near-shore	127	124	49	55	20
All districts	Fishing as primary activity - off-shore	67	66	27	32	7
All districts	Aquaculture as primary activity - extensive	210	207	68	84	55
All districts	Aquaculture as primary activity - intensive	46	46	21	19	6
All districts	Other as primary activity	149	146	31	69	46
Dam Doi	All sectors	220	216	46	83	87
Dam Doi	Fishing as primary activity - near-shore	15	15	0	3	12
Dam Doi	Fishing as primary activity - off-shore	19	18	3	10	5
Dam Doi	Aquaculture as primary activity - extensive	77	75	13	30	32
Dam Doi	Aquaculture as primary activity - intensive	34	34	18	12	4
Dam Doi	Other as primary activity	75	74	12	28	34
Tran van Thoi	All sectors	179	175	40	106	29
Tran van Thoi	Fishing as primary activity - near-shore	34	32	6	22	4
Tran van Thoi	Fishing as primary activity - off-shore	42	42	19	21	2
Tran van Thoi	Aquaculture as primary activity - extensive	45	44	5	28	11
Tran van Thoi	Aquaculture as primary activity - intensive	12	12	3	7	2
Tran van Thoi	Other as primary activity	46	45	7	28	10
Hue	All sectors	200	198	110	70	18
Hue	Fishing as primary activity - near-shore	78	77	43	30	4
Hue	Fishing as primary activity - off-shore	6	6	5	1	0
Hue	Aquaculture as primary activity - extensive	88	88	50	26	12
Hue	Aquaculture as primary activity - intensive	.	.	.	.	.
Hue	Other as primary activity	28	27	12	13	2

Appendix IIg Household data analysis – Average land area in m² and ha by primary activity by district

Geography	Primary sector	Total number of households	Total land area - households	Total land area - mean (m²)	Total land area - mean (ha)
All districts	All sectors	599	599	15615.76	1.56
All districts	Fishing as primary activity - near-shore	127	127	5593.464	0.56
All districts	Fishing as primary activity - off-shore	67	67	2437.522	0.24
All districts	Aquaculture as primary activity - extensive	210	210	21344.79	2.13
All districts	Aquaculture as primary activity - intensive	46	46	27211.35	2.72
All districts	Other as primary activity	149	149	18429.72	1.84
Dam Doi	All sectors	220	220	23467.31	2.35
Dam Doi	Fishing as primary activity - near-shore	15	15	2391.533	0.24
Dam Doi	Fishing as primary activity - off-shore	19	19	6051.21	0.61
Dam Doi	Aquaculture as primary activity - extensive	77	77	27448.1	2.74
Dam Doi	Aquaculture as primary activity - intensive	34	34	30490.29	3.05
Dam Doi	Other as primary activity	75	75	24823.84	2.48
Tran van Thoi	All sectors	179	179	11572.17	1.16
Tran van Thoi	Fishing as primary activity - near-shore	34	34	5646.324	0.56
Tran van Thoi	Fishing as primary activity - off-shore	42	42	1128.357	0.11
Tran van Thoi	Aquaculture as primary activity - extensive	45	45	21089.18	2.11
Tran van Thoi	Aquaculture as primary activity - intensive	12	12	17921	1.79
Tran van Thoi	Other as primary activity	46	46	14521.48	1.45
Hue	All sectors	200	200	10598.07	1.06
Hue	Fishing as primary activity - near-shore	78	78	6186.18	0.62
Hue	Fishing as primary activity - off-shore	6	6	158.3333	0.02
Hue	Aquaculture as primary activity - extensive	88	88	16135.11	1.61
Hue	Aquaculture as primary activity - intensive	.	0	0.000	0.00
Hue	Other as primary activity	28	28	7723.286	0.77

Appendix IIIh

Household data analysis – Average number of household occupants by primary activity by district

Geography	Primary sector	Total number of households	Number of household occupants - households reporting	Number of household occupants - total number of individuals	Number of household occupants - average number of people per household
All districts	All sectors	599	599	2861	4.77629
All districts	Fishing as primary activity - near-shore	127	127	599	4.71654
All districts	Fishing as primary activity - off-shore	67	67	304	4.53731
All districts	Aquaculture as primary activity - extensive	210	210	1005	4.78571
All districts	Aquaculture as primary activity - intensive	46	46	220	4.78261
All districts	Other as primary activity	149	149	733	4.91946
Dam Doi	All sectors	220	220	1064	4.83636
Dam Doi	Fishing as primary activity - near-shore	15	15	70	4.66667
Dam Doi	Fishing as primary activity - off-shore	19	19	96	5.05263
Dam Doi	Aquaculture as primary activity - extensive	77	77	378	4.90909
Dam Doi	Aquaculture as primary activity - intensive	34	34	161	4.73529
Dam Doi	Other as primary activity	75	75	359	4.78667
Tran van Thoi	All sectors	179	179	769	4.29609
Tran van Thoi	Fishing as primary activity - near-shore	34	34	134	3.94118
Tran van Thoi	Fishing as primary activity - off-shore	42	42	174	4.14286
Tran van Thoi	Aquaculture as primary activity - extensive	45	45	190	4.22222
Tran van Thoi	Aquaculture as primary activity - intensive	12	12	59	4.91667
Tran van Thoi	Other as primary activity	46	46	212	4.6087
Hue	All sectors	200	200	1028	5.14
Hue	Fishing as primary activity - near-shore	78	78	395	5.0641
Hue	Fishing as primary activity - off-shore	6	6	34	5.66667
Hue	Aquaculture as primary activity - extensive	88	88	437	4.96591
Hue	Aquaculture as primary activity - intensive	.	.	.	.
Hue	Other as primary activity	28	28	162	5.78571

Appendix IIIa

Fishing species analysis – Species fished by primary activity

Species	Number of species reported	Fishing as primary activity - near-shore	Fishing as primary activity - off-shore	Aquaculture as primary activity - extensive	Aquaculture as primary activity - intensive	Other as primary activity
All species	545	270	173	54	0	48
Wild mixed shrimp	135	90	11	15	0	19
Crab	17	10	0	6	0	1
Tuna	37	0	36	0	0	1
Squid	80	26	48	0	0	6
Mackeral	32	1	30	0	0	1
Barramundi	0	0	0	0	0	0
Ray (skate)	7	2	4	1	0	0
Trash fish (mixed small species)	81	43	28	4	0	6
Tigerfish	6	3	2	1	0	0
Snapper	0	0	0	0	0	0
Oyster	3	2	0	1	0	0
Mussels	4	3	0	0	0	1
Snails	1	1	0	0	0	0
Grouper	5	0	5	0	0	0
Catfish	6	5	0	1	0	0
Croaker fish	1	0	1	0	0	0
Goby	62	45	0	9	0	8
Carp	13	10	0	1	0	2
Leather jacket	1	0	1	0	0	0
Mahi mahi	5	1	4	0	0	0
Mullet	4	1	0	3	0	0
Bream (including yellow, black, and threadfin sea bream)	9	3	3	2	0	1
Tilapia	1	0	0	0	0	1
Whipfin silver biddy	22	15	0	7	0	0
Siamese Glass fish	13	9	0	3	0	1

Appendix IIIB

Fishing species analysis – Species fished by district

	All districts	Dam Doi	Tran van Thoi	Hue
All species	545	90	183	272
Wild mixed shrimp	135	26	21	88
Crab	17	0	0	17
Tuna	37	5	29	3
Squid	80	11	69	0
Mackeral	32	3	27	2
Barramundi	0	0	0	0
Ray (skate)	7	7	0	0
Trash fish (mixed small species)	81	32	31	18
Tigerfish	6	0	0	6
Snapper	0	0	0	0
Oyster	3	2	0	1
Mussels	4	2	0	2
Snails	1	1	0	0
Grouper	5	0	4	1
Catfish	6	0	2	4
Croaker fish	1	1	0	0
Goby	62	0	0	62
Carp	13	0	0	13
Leather jacket	1	0	0	1
Mahi mahi	5	0	0	5
Mullet	4	0	0	4
Bream (including yellow, black, and threadfin sea bream)	9	0	0	9
Tilapia	1	0	0	1
Whipfin silver biddy	22	0	0	22
Siamese Glass fish	13	0	0	13

Appendix IIIc

Fishing species analysis – Species fished by primary activity by district

Geography	Species	Fishing as primary activity - near-shore	Fishing as primary activity - off-shore	Aquaculture as primary activity - extensive	Aquaculture as primary activity - intensive	Other as primary activity
Dam Doi	Wild mixed shrimp	9	11	1	0	5
Dam Doi	Crab	0	0	0	0	0
Dam Doi	Tuna	0	5	0	0	0
Dam Doi	Squid	1	6	0	0	4
Dam Doi	Mackeral	0	3	0	0	0
Dam Doi	Barramundi	0	0	0	0	0
Dam Doi	Ray (skate)	2	4	1	0	0
Dam Doi	Trash fish (mixed small species)	12	16	2	0	2
Dam Doi	Tigerfish	0	0	0	0	0
Dam Doi	Snapper	0	0	0	0	0
Dam Doi	Oyster	1	0	1	0	0
Dam Doi	Mussels	2	0	0	0	0
Dam Doi	Snails	1	0	0	0	0
Dam Doi	Grouper	0	0	0	0	0
Dam Doi	Catfish	0	0	0	0	0
Dam Doi	Croaker fish	0	1	0	0	0
Dam Doi	Goby	0	0	0	0	0
Dam Doi	Carp	0	0	0	0	0
Dam Doi	Leather jacket	0	0	0	0	0
Dam Doi	Mahi mahi	0	0	0	0	0
Dam Doi	Mullet	0	0	0	0	0

Geography	Species	Fishing as primary activity - near- shore	Fishing as primary activity - off-shore	Aquaculture as primary activity - extensive	Aquaculture as primary activity - intensive	Other as primary activity
Dam Doi	Bream (including yellow, black, and threadfin sea bream)	0	0	0	0	0
Dam Doi	Tilapia	0	0	0	0	0
Dam Doi	Whipfin silver biddy	0	0	0	0	0
Dam Doi	Siamese Glass fish	0	0	0	0	0
Tran van Thoi	Wild mixed shrimp	18	0	0	0	3
Tran van Thoi	Crab	0	0	0	0	0
Tran van Thoi	Tuna	0	28	0	0	1
Tran van Thoi	Squid	25	42	0	0	2
Tran van Thoi	Mackeral	0	26	0	0	1
Tran van Thoi	Barramundi	0	0	0	0	0
Tran van Thoi	Ray (skate)	0	0	0	0	0
Tran van Thoi	Trash fish (mixed small species)	18	12	0	0	1
Tran van Thoi	Tigerfish	0	0	0	0	0
Tran van Thoi	Snapper	0	0	0	0	0
Tran van Thoi	Oyster	0	0	0	0	0

Geography	Species	Fishing as primary activity - near- shore	Fishing as primary activity - off-shore	Aquaculture as primary activity - extensive	Aquaculture as primary activity - intensive	Other as primary activity
Tran van Thoi	Mussels	0	0	0	0	0
Tran van Thoi	Snails	0	0	0	0	0
Tran van Thoi	Grouper	0	4	0	0	0
Tran van Thoi	Catfish	2	0	0	0	0
Tran van Thoi	Croaker fish	0	0	0	0	0
Tran van Thoi	Goby	0	0	0	0	0
Tran van Thoi	Carp	0	0	0	0	0
Tran van Thoi	Leather jacket	0	0	0	0	0
Tran van Thoi	Mahi mahi	0	0	0	0	0
Tran van Thoi	Mullet	0	0	0	0	0
Tran van Thoi	Bream (including yellow, black, and threadfin sea bream)	0	0	0	0	0
Tran van Thoi	Tilapia	0	0	0	0	0
Tran van Thoi	Whipfin silver biddy	0	0	0	0	0
Tran van Thoi	Siamese Glass fish	0	0	0	0	0

Geography	Species	Fishing as primary activity - near- shore	Fishing as primary activity - off-shore	Aquaculture as primary activity - extensive	Aquaculture as primary activity - intensive	Other as primary activity
Hue	Wild mixed shrimp	60	0	14	0	14
Hue	Crab	10	0	6	0	1
Hue	Tuna	0	3	0	0	0
Hue	Squid	0	0	0	0	0
Hue	Mackeral	1	1	0	0	0
Hue	Barramundi	0	0	0	0	0
Hue	Ray (skate)	0	0	0	0	0
Hue	Trash fish (mixed small species)	13	0	2	0	3
Hue	Tigerfish	3	2	1	0	0
Hue	Snapper	0	0	0	0	0
Hue	Oyster	1	0	0	0	0
Hue	Mussels	1	0	0	0	1
Hue	Snails	0	0	0	0	0
Hue	Grouper	0	1	0	0	0
Hue	Catfish	3	0	1	0	0
Hue	Croaker fish	0	0	0	0	0
Hue	Goby	42	0	9	0	11
Hue	Carp	9	0	1	0	3
Hue	Leather jacket	0	1	0	0	0
Hue	Mahi mahi	1	4	0	0	0
Hue	Mullet	1	0	3	0	0
Hue	Bream (including yellow, black, and threadfin sea bream)	3	3	2	0	1

Geography	Species	Fishing as primary activity - near- shore	Fishing as primary activity - off-shore	Aquaculture as primary activity - extensive	Aquaculture as primary activity - intensive	Other as primary activity
Hue	Tilapia	0	0	0	0	1
Hue	Whipfin silver biddy	15	0	7	0	0
Hue	Siamese Glass fish	9	0	3	0	1

Appendix IIId Fishing species analysis – Top species fished by primary activity by district

Geography	Primary sector	Count wild mixed shrimp	Quantity wild mixed shrimp (kg)	Count squid	Quantity squid (kg)	Count trash fish	Quantity trash fish (kg)	Count Tuna	Quantity tuna (kg)	Count goby	Quantity goby (kg)	Count whipfin silver biddy	Quantity whipfin silver biddy (kg)
All districts	All sectors	135	1,420	80	10,143	80	10,893	37	5,946	62	206	22	103
All districts	Fishing as primary	90	1,394	26	2,640	42	1,262	.	.	45	228	15	116
All districts	Fishing as primary	11	2,023	48	15,085	28	28,843	36	6,028	.	.	.	.
All districts	Aquaculture as primary	15	179	.	.	4	115	.	.	9	140	7	76
All districts	Aquaculture as primary	.	.	.	.	.	.	.	.	.	.	.	.
All districts	Other as primary	19	2,175	6	3,108	6	1,730	1	3,000	8	151	.	.
Dam Doi	All sectors	26	2,412	11	2,855	31	3,350	5	1,420	.	.	.	.
Dam Doi	Fishing as primary	9	318	1	100	11	468	.	.	.	.	.	.
Dam Doi	Fishing as primary	11	2,023	6	4,467	16	5,538	5	1,420	.	.	.	.
Dam Doi	Aquaculture as primary	1	100	.	.	2	155	.	.	.	.	.	.
Dam Doi	Aquaculture as primary	.	.	.	.	.	.	.	.	.	.	.	.
Dam Doi	Other as primary	5	7,500	4	1,125	2	4,900	.	.	.	.	.	.
Tran van Thoi	All sectors	21	4,686	69	11,304	31	24,664	29	7,203	.	.	.	.
Tran van Thoi	Fishing as primary	18	5,372	25	2,742	18	2,516	.	.	.	.	.	.
Tran van Thoi	Fishing as primary	.	.	42	16,602	12	59,917	28	7,354	.	.	.	.
Tran van Thoi	Aquaculture as primary	.	.	.	.	.	.	.	.	.	.	.	.
Tran van Thoi	Aquaculture as primary	.	.	.	.	.	.	.	.	.	.	.	.
Tran van Thoi	Other as primary	3	567	2	7,075	1	300	1	3,000	.	.	.	.
Hue	All sectors	88	348	.	.	18	166	3	1,333	62	206	22	103
Hue	Fishing as primary	63	411	.	.	13	196	.	.	45	228	15	116
Hue	Fishing as primary	.	.	.	.	.	.	3	1,333	.	.	.	.
Hue	Aquaculture as primary	14	185	.	.	2	75	.	.	9	140	7	76
Hue	Aquaculture as primary	.	.	.	.	.	.	.	.	.	.	.	.
Hue	Other as primary	11	194	.	.	3	93	.	.	8	151	.	.

Appendix IIIe

Aquaculture species analysis - Species farmed by primary activity

Species	All sectors	Fishing as primary activity - near-shore	Fishing as primary activity - off-shore	Aquaculture as primary activity - extensive	Aquaculture as primary activity - intensive	Other as primary activity
All species	1081	118	20	537	106	300
Black tiger shrimp	424	44	4	203	45	128
Whiteleg shrimp	37	0	0	4	26	7
Greasy back shrimp	1	0	0	1	0	0
Crab	370	34	4	196	29	107
Sea bass	35	6	6	15	0	8
Eel	0	0	0	0	0	0
Blood Cockle	0	0	0	0	0	0
Tilapia	8	0	0	5	2	1
Goby (including dragon fish goby and marble sleeper goby)	16	0	1	4	2	9
Mussel	2	0	0	2	0	0
Spotted scat	1	0	0	0	0	1
Rabbitfish	125	30	2	77	0	16
Tigerfish	1	1	0	0	0	0
Snapper	4	2	1	1	0	0
Bream	2	0	2	0	0	0
Fish generally	55	1	0	29	2	23

Species	All districts	Dam Doi	Tran van Thoi	Hue
All species	1081	464	200	417
Black tiger shrimp	424	182	100	142
Whiteleg shrimp	37	35	0	2
Greasy back shrimp	1	0	0	1
Crab	370	160	88	122
Sea bass	35	16	5	14
Eel	0	0	0	0
Blood Cockle	0	0	0	0
Tilapia	8	8	0	0
Goby (including dragon fish goby and marble sleeper goby)	16	11	5	0
Mussel	2	0	0	2
Spotted scat	1	1	0	0
Rabbitfish	125	0	0	125
Tigerfish	1	0	0	1
Snapper	4	0	0	4
Bream	2	0	0	2
Fish generally	55	51	2	2

Appendix IIIg

Aquaculture species analysis – Species farmed by primary activity by district

Geography	Species	Fishing as primary activity - near-shore	Fishing as primary activity - off-shore	Aquaculture as primary activity - extensive	Aquaculture as primary activity - intensive	Other as primary activity
Dam Doi	Black tiger shrimp	2	2	77	33	68
Dam Doi	Whiteleg shrimp	0	0	2	26	7
Dam Doi	Greasy back shrimp	0	0	0	0	0
Dam Doi	Crab	2	2	77	19	60
Dam Doi	Sea bass	0	0	10	0	6
Dam Doi	Eel	0	0	0	0	0
Dam Doi	Blood Cockle	0	0	0	0	0
Dam Doi	Tilapia	0	0	5	2	1
Dam Doi	Goby (including dragon fish goby and marble sleeper goby)	0	1	4	2	4
Dam Doi	Mussel	0	0	0	0	0
Dam Doi	Spotted scat	0	0	0	0	1
Dam Doi	Rabbitfish	0	0	0	0	0
Dam Doi	Tigerfish	0	0	0	0	0
Dam Doi	Snapper	0	0	0	0	0
Dam Doi	Bream	0	0	0	0	0
Dam Doi	Fish generally	1	0	27	1	22
Tran van Thoi	Black tiger shrimp	0	2	45	12	41
Tran van Thoi	Whiteleg shrimp	0	0	0	0	0
Tran van Thoi	Greasy back shrimp	0	0	0	0	0
Tran van Thoi	Crab	0	2	44	10	32
Tran van Thoi	Sea bass	0	1	3	0	1

Geography	Species	Fishing as primary activity - near-shore	Fishing as primary activity - off-shore	Aquaculture as primary activity - extensive	Aquaculture as primary activity - intensive	Other as primary activity
Tran van Thoi	Eel	0	0	0	0	0
Tran van Thoi	Blood Cockle	0	0	0	0	0
Tran van Thoi	Tilapia	0	0	0	0	0
Tran van Thoi	Goby (including dragon fish goby and marble sleeper goby)	0	0	0	0	5
Tran van Thoi	Mussel	0	0	0	0	0
Tran van Thoi	Spotted scat	0	0	0	0	0
Tran van Thoi	Rabbitfish	0	0	0	0	0
Tran van Thoi	Tigerfish	0	0	0	0	0
Tran van Thoi	Snapper	0	0	0	0	0
Tran van Thoi	Bream	0	0	0	0	0
Tran van Thoi	Fish generally	0	0	1	1	0
Hue	Black tiger shrimp	42	0	81	.	19
Hue	Whiteleg shrimp	0	0	2	.	0
Hue	Greasy back shrimp	0	0	1	.	0
Hue	Crab	32	0	75	.	15
Hue	Sea bass	6	5	2	.	1
Hue	Eel	0	0	0	.	0
Hue	Blood Cockle	0	0	0	.	0
Hue	Tilapia	0	0	0	.	0
Hue	Goby (including dragon fish goby and marble sleeper goby)	0	0	0	.	0
Hue	Mussel	0	0	2	.	0
Hue	Spotted scat	0	0	0	.	0
Hue	Rabbitfish	30	2	77	.	16

Geography	Species	Fishing as primary activity - near-shore	Fishing as primary activity - off-shore	Aquaculture as primary activity - extensive	Aquaculture as primary activity - intensive	Other as primary activity
Hue	Tigerfish	1	0	0	.	0
Hue	Snapper	2	1	1	.	0
Hue	Bream	0	2	0	.	0
Hue	Fish generally	0	0	1	.	1

Appendix IIIh Aquaculture species analysis – Top species farmed by primary activity by district

Primary sector	Count black tiger shrimp	Quantity black tiger shrimp (kg)	Count whiteleg shrimp	Quantity whiteleg shrimp (kg)	Count crab	Quantity crab (kg)	Count rabbitfish	Quantity rabbitfish (kg)	Count fish generally	Quantity fish generally (kg)	Count seabass	Quantity seabass (kg)
All sectors	419	461.5131	33	3434.242	349	132.4069	122	176.1475	55	364.1818	35	320.5714
Fishing as primary activity ☐ near-shore	43	134.5814	.	.	34	96.61765	29	131.3793	1	1500	6	345
Fishing as primary activity ☐ off-shore	4	425	.	.	4	250	2	110	.	.	6	440
Aquaculture as primary activity ☐ extensive	200	336.17	4	737.5	194	145.3247	76	215.5263	29	393.1035	15	295.3333
Aquaculture as primary activity ☐ intensive	45	1589.2	24	4291.667	17	174.7059	.	.	2	800	.	.
Other as primary activity	127	371.1732	5	1476	100	107.62	15	72	23	240.4348	8	260
All sectors	182	659.5824	31	3644.516	140	127.8643	.	.	51	371.1765	16	164.375
Fishing as primary activity ☐ near-shore	2	320	.	.	2	120	.	.	1	1500	.	.
Fishing as primary activity ☐ off-shore	2	400	.	.	2	190	.	.	.	.	.	.
Aquaculture as primary activity ☐ extensive	77	475.5844	2	1300	75	141.2667	.	.	27	401.8518	10	210
Aquaculture as primary activity ☐ intensive	33	1657.576	24	4291.667	7	218.5714	.	.	1	1200	.	.
Other as primary activity	68	401.2353	5	1476	54	95.48148	.	.	22	244.5455	6	88.33334
All sectors	100	527.63	.	.	86	138	.	.	2	400	5	176
Fishing as primary activity ☐ near-shore	.	.	.	.	.	.	.	.	.	.	.	.
Fishing as primary activity ☐ off-shore	2	450	.	.	2	310	.	.	.	.	1	200
Aquaculture as primary activity ☐ extensive	45	391.3111	.	.	44	143.3636	.	.	1	400	3	210
Aquaculture as primary activity ☐ intensive	12	1401.167	.	.	10	144	.	.	1	400	.	.
Other as primary activity	41	425.3658	.	.	32	118	.	.	.	.	1	50
All sectors	137	150.1241	2	175	121	133.595	122	176.1475	2	150	14	550.7143
Fishing as primary activity ☐ near-shore	41	125.5366	.	.	32	95.15625	29	131.3793	.	.	6	345
Fishing as primary activity ☐ off-shore	0	0	.	.	0	0	2	110	.	.	5	488
Aquaculture as primary activity ☐ extensive	78	166.7308	2	175	75	150.5333	76	215.5263	1	150	2	850
Aquaculture as primary activity ☐ intensive	.	.	.	.	.	.	.	.	.	.	.	.
Other as primary activity	18	134.1667	.	.	14	130.7143	15	72	1	150	1	1500

Appendix IV

Income reconciliation with Household Living Standards survey results, 2012

Province	District	Commune	Fishing	Aquaculture	Farm	Wage	Self-employed	Other	Total
			2012	2012	2012	2012	2012	2012	2012
Ca Mau	District 1- Dam Doi	Commune 1— Tan Duyet	0.00	73.99	0.00	68.82	58.18	0.00	110.19
		Commune 3— TAK	18.00	43.56	14.50	26.42	90.11	0.00	84.08
		Commune 6— Nguyen Huan	26.00	18.84	7.99	23.82	52.00	12.40	50.89
		Commune 8— Tau Thuan	91.24	64.84	25.08	38.04	62.92	12.03	108.57
		Total (Dam Doi)	65.49	49.82	10.51	38.93	68.39	12.34	89.34
	District 2- Tran Van Tho	Commune 2— Phong Dien	140.00	51.22	12.75	41.41	94.17	0.00	81.44
		Commune 4— Khanh Binh Tay	185.59	0.00	28.63	24.67	30.00	0.00	209.66
		Commune 5— Song Doc Town	978.97	31.25	50.00	66.00	166.67	0.00	1,002.34
		Commune 7— Loi An	0.00	50.62	13.34	36.62	115.17	0.00	97.68
		Total (Tran Van Tho)	571.79	50.73	19.24	40.19	111.63	0.00	315.27
	Total (Ca Mau)		377.06	50.14	15.83	39.46	78.27	12.34	190.70
Total (Ca Mau but excluding commune 4 & 5)		66.95	50.20	11.88	38.72	74.98	12.34	89.41	
Hue	District 3- Phu Vang	Commune 9— Vinh Ha	27.23	12.63	4.91	16.55	15.17	11.00	52.35
		Commune 10— Thuan An	37.12	35.50	10.67	16.34	29.80	12.38	70.21
		Commune 11— Phu Xuan	30.71	51.06	10.20	20.78	24.78	5.00	68.42
		Commune 12— Vinh Xuan	27.82	29.27	15.45	39.57	31.14	17.50	57.23
		Total (Phu Vang)	29.70	34.49	9.48	18.82	25.66	11.90	62.05
	Total (Hue)		29.70	34.49	9.48	18.82	25.66	11.90	62.05
All Selected Area			210.33	44.43	14.34	31.19	59.14	12.03	147.75
All Selected Area (excluding commune 4 & 5)			40.81	44.46	11.20	30.43	56.37	12.03	78.89

Appendix Va

Vulnerability analysis - Average vulnerability by number of activities in livelihood portfolio by primary activity by district

Geography	Primary activity	Number of activities in livelihood portfolio	Households reporting	Average vulnerability
All geographies	All primary activities	All portfolios	599	0.3
All geographies	All primary activities	1	176	0.536801
All geographies	All primary activities	2	271	0.2291622
All geographies	All primary activities	3	121	0.1634132
All geographies	All primary activities	4	20	0.1273808
All geographies	All primary activities	5	6	0.0396418
All geographies	All primary activities	6	5	0.0162073
All geographies	Fishing - nearshore	All portfolios	127	0.21
All geographies	Fishing - nearshore	1	33	0.4309673
All geographies	Fishing - nearshore	2	62	0.1600633
All geographies	Fishing - nearshore	3	21	0.0956836
All geographies	Fishing - nearshore	4	6	0.0543208
All geographies	Fishing - nearshore	5	2	0.0277155
All geographies	Fishing - nearshore	6	3	0.0199765
All geographies	Fishing - offshore	All portfolios	67	0.23
All geographies	Fishing - offshore	1	42	0.2798859
All geographies	Fishing - offshore	2	19	0.1479715
All geographies	Fishing - offshore	3	4	0.1107842
All geographies	Fishing - offshore	4	.	.
All geographies	Fishing - offshore	5	1	0.0745281
All geographies	Fishing - offshore	6	1	0.0107547

Geography	Primary activity	Number of activities in livelihood portfolio	Households reporting	Average vulnerability
All geographies	Aquaculture - extensive	All portfolios	210	0.44
All geographies	Aquaculture - extensive	1	75	0.7602488
All geographies	Aquaculture - extensive	2	88	0.3112376
All geographies	Aquaculture - extensive	3	39	0.1980339
All geographies	Aquaculture - extensive	4	5	0.0870892
All geographies	Aquaculture - extensive	5	2	0.0231034
All geographies	Aquaculture - extensive	6	1	0.0103523
All geographies	Aquaculture - intensive	All portfolios	46	0.31
All geographies	Aquaculture - intensive	1	24	0.4302047
All geographies	Aquaculture - intensive	2	17	0.1868959
All geographies	Aquaculture - intensive	3	5	0.1075689
All geographies	Aquaculture - intensive	4	.	.
All geographies	Aquaculture - intensive	5	.	.
All geographies	Aquaculture - intensive	6	.	.
All geographies	Other activities	All portfolios	149	0.21
All geographies	Other activities	1	2	0.5781401
All geographies	Other activities	2	85	0.2211935
All geographies	Other activities	3	52	0.174218
All geographies	Other activities	4	9	0.1984715
All geographies	Other activities	5	1	0.0616852
All geographies	Other activities	6	.	.
Dam Doi	All primary activities	All portfolios	220	0.39
Dam Doi	All primary activities	1	74	0.725829
Dam Doi	All primary activities	2	100	0.2581767

Geography	Primary activity	Number of activities in livelihood portfolio	Households reporting	Average vulnerability
Dam Doi	All primary activities	3	38	0.1537214
Dam Doi	All primary activities	4	7	0.1642364
Dam Doi	All primary activities	5	1	0.0745281
Dam Doi	All primary activities	6	.	.
Dam Doi	Fishing - nearshore	All portfolios	15	0.44
Dam Doi	Fishing - nearshore	1	12	0.5189442
Dam Doi	Fishing - nearshore	2	2	0.1563212
Dam Doi	Fishing - nearshore	3	.	.
Dam Doi	Fishing - nearshore	4	1	0.0811192
Dam Doi	Fishing - nearshore	5	.	.
Dam Doi	Fishing - nearshore	6	.	.
Dam Doi	Fishing - offshore	All portfolios	19	0.54
Dam Doi	Fishing - offshore	1	11	0.7657443
Dam Doi	Fishing - offshore	2	7	0.2424044
Dam Doi	Fishing - offshore	3	.	.
Dam Doi	Fishing - offshore	4	.	.
Dam Doi	Fishing - offshore	5	1	0.0745281
Dam Doi	Fishing - offshore	6	.	.
Dam Doi	Aquaculture - extensive	All portfolios	77	0.54
Dam Doi	Aquaculture - extensive	1	29	0.9949073
Dam Doi	Aquaculture - extensive	2	28	0.3427862
Dam Doi	Aquaculture - extensive	3	18	0.1679727
Dam Doi	Aquaculture - extensive	4	2	0.1549913
Dam Doi	Aquaculture - extensive	5	.	.
Dam Doi	Aquaculture - extensive	6	.	.
Dam Doi	Aquaculture - intensive	All portfolios	34	0.32
Dam Doi	Aquaculture - intensive	1	20	0.4526118
Dam Doi	Aquaculture - intensive	2	11	0.155964
Dam Doi	Aquaculture - intensive	3	3	0.0897915
Dam Doi	Aquaculture - intensive	4	.	.
Dam Doi	Aquaculture - intensive	5	.	.
Dam Doi	Aquaculture - intensive	6	.	.
Dam Doi	Other activities	All portfolios	75	0.23
Dam Doi	Other activities	1	2	0.5781401
Dam Doi	Other activities	2	52	0.2402803
Dam Doi	Other activities	3	17	0.1499135
Dam Doi	Other activities	4	4	0.1896382
Dam Doi	Other activities	5	.	.

Geography	Primary activity	Number of activities in livelihood portfolio	Households reporting	Average vulnerability
Dam Doi	Other activities	6	.	.
Tran van Thoi	All primary activities	All portfolios	179	0.28
Tran van Thoi	All primary activities	1	63	0.3636689
Tran van Thoi	All primary activities	2	79	0.2372516
Tran van Thoi	All primary activities	3	34	0.238167
Tran van Thoi	All primary activities	4	3	0.2574251
Tran van Thoi	All primary activities	5	.	.
Tran van Thoi	All primary activities	6	.	.
Tran van Thoi	Fishing - nearshore	All portfolios	34	0.14
Tran van Thoi	Fishing - nearshore	1	8	0.2180306
Tran van Thoi	Fishing - nearshore	2	25	0.1502744
Tran van Thoi	Fishing - nearshore	3	1	0.142039
Tran van Thoi	Fishing - nearshore	4	.	.
Tran van Thoi	Fishing - nearshore	5	.	.
Tran van Thoi	Fishing - nearshore	6	.	.
Tran van Thoi	Fishing - offshore	All portfolios	42	0.1
Tran van Thoi	Fishing - offshore	1	31	0.1074845
Tran van Thoi	Fishing - offshore	2	9	0.0615975
Tran van Thoi	Fishing - offshore	3	2	0.083833
Tran van Thoi	Fishing - offshore	4	.	.
Tran van Thoi	Fishing - offshore	5	.	.
Tran van Thoi	Fishing - offshore	6	.	.
Tran van Thoi	Aquaculture - extensive	All portfolios	45	0.64
Tran van Thoi	Aquaculture - extensive	1	20	0.8281102
Tran van Thoi	Aquaculture - extensive	2	18	0.4954852
Tran van Thoi	Aquaculture - extensive	3	7	0.445528
Tran van Thoi	Aquaculture - extensive	4	.	.
Tran van Thoi	Aquaculture - extensive	5	.	.
Tran van Thoi	Aquaculture - extensive	6	.	.
Tran van Thoi	Aquaculture - intensive	All portfolios	12	0.25
Tran van Thoi	Aquaculture - intensive	1	4	0.3181689
Tran van Thoi	Aquaculture - intensive	2	6	0.2436044
Tran van Thoi	Aquaculture - intensive	3	2	0.1342351
Tran van Thoi	Aquaculture - intensive	4	.	.
Tran van Thoi	Aquaculture - intensive	5	.	.
Tran van Thoi	Aquaculture - intensive	6	.	.
Tran van Thoi	Other activities	All portfolios	46	0.2
Tran van Thoi	Other activities	1	.	.

Geography	Primary activity	Number of activities in livelihood portfolio	Households reporting	Average vulnerability
Tran van Thoi	Other activities	2	21	0.1929183
Tran van Thoi	Other activities	3	22	0.2000367
Tran van Thoi	Other activities	4	3	0.2574251
Tran van Thoi	Other activities	5	.	.
Tran van Thoi	Other activities	6	.	.
Hue	All primary activities	All portfolios	200	0.21
Hue	All primary activities	1	39	0.4578074
Hue	All primary activities	2	92	0.1906785
Hue	All primary activities	3	49	0.1190592
Hue	All primary activities	4	10	0.0625685
Hue	All primary activities	5	5	0.0326646
Hue	All primary activities	6	5	0.016207
Hue	Fishing - nearshore	All portfolios	78	0.18
Hue	Fishing - nearshore	1	13	0.4807959
Hue	Fishing - nearshore	2	35	0.1672691
Hue	Fishing - nearshore	3	20	0.0933659
Hue	Fishing - nearshore	4	5	0.0489612
Hue	Fishing - nearshore	5	2	0.0277155
Hue	Fishing - nearshore	6	3	0.0199765
Hue	Fishing - offshore	All portfolios	6	0.14
Hue	Fishing - offshore	1	.	.
Hue	Fishing - offshore	2	3	0.1867497
Hue	Fishing - offshore	3	2	0.1377354
Hue	Fishing - offshore	4	.	.
Hue	Fishing - offshore	5	.	.
Hue	Fishing - offshore	6	1	0.0107547
Hue	Aquaculture - extensive	All portfolios	88	0.25
Hue	Aquaculture - extensive	1	26	0.4463131
Hue	Aquaculture - extensive	2	42	0.2112421
Hue	Aquaculture - extensive	3	14	0.112937
Hue	Aquaculture - extensive	4	3	0.0418212
Hue	Aquaculture - extensive	5	2	0.0231034
Hue	Aquaculture - extensive	6	1	0.0103523
Hue	Aquaculture - intensive	All portfolios	.	.
Hue	Aquaculture - intensive	1	.	.
Hue	Aquaculture - intensive	2	.	.
Hue	Aquaculture - intensive	3	.	.
Hue	Aquaculture - intensive	4	.	.

Geography	Primary activity	Number of activities in livelihood portfolio	Households reporting	Average vulnerability
Hue	Aquaculture - intensive	5	.	.
Hue	Aquaculture - intensive	6	.	.
Hue	Other activities	All portfolios	28	0.17
Hue	Other activities	1	.	.
Hue	Other activities	2	12	0.1879653
Hue	Other activities	3	13	0.1623075
Hue	Other activities	4	2	0.1277079
Hue	Other activities	5	1	0.0616852
Hue	Other activities	6	.	.

Appendix Vb

Vulnerability analysis - Average vulnerability by income dependency on primary activity by primary activity by district

Geography	Primary activity	Income dependency on primary activity	Households reporting	Average vulnerability
All geographies	All primary activities	All levels of dependency	599	0.2991977
All geographies	All primary activities	Greater than 0.9 and less than or equal to 1	217	0.4855339
All geographies	All primary activities	Greater than 0.8 and less than or equal to 0.9	64	0.2969934
All geographies	All primary activities	Greater than 0.7 and less than or equal to 0.8	75	0.2383065
All geographies	All primary activities	Greater than 0.6 and less than or equal to 0.7	103	0.1766545
All geographies	All primary activities	Greater than 0.5 and less than or equal to 0.6	70	0.1693075
All geographies	All primary activities	Greater than 0.4 and less than or equal to 0.5	54	0.1171473
All geographies	All primary activities	Greater than 0.3 and less than or equal to 0.4	11	0.0473709
All geographies	All primary activities	Less than or equal to 0.3	5	0.0168104
All geographies	Fishing - nearshore	All levels of dependency	127	0.2094211
All geographies	Fishing - nearshore	Greater than 0.9 and less than or equal to 1	44	0.3751673
All geographies	Fishing - nearshore	Greater than 0.8 and less than or equal to 0.9	13	0.1881229
All geographies	Fishing - nearshore	Greater than 0.7 and less than or equal to 0.8	11	0.1521205
All geographies	Fishing - nearshore	Greater than 0.6 and less than or equal to 0.7	22	0.1462841

Geography	Primary activity	Income dependency on primary activity	Households reporting	Average vulnerability
All geographies	Fishing - nearshore	Greater than 0.5 and less than or equal to 0.6	11	0.1002518
All geographies	Fishing - nearshore	Greater than 0.4 and less than or equal to 0.5	21	0.0721073
All geographies	Fishing - nearshore	Greater than 0.3 and less than or equal to 0.4	5	0.0269855
All geographies	Fishing - nearshore	Less than or equal to 0.3	.	.
All geographies	Fishing - offshore	All levels of dependency	67	0.2252997
All geographies	Fishing - offshore	Greater than 0.9 and less than or equal to 1	50	0.2503629
All geographies	Fishing - offshore	Greater than 0.8 and less than or equal to 0.9	4	0.0701145
All geographies	Fishing - offshore	Greater than 0.7 and less than or equal to 0.8	3	0.2183807
All geographies	Fishing - offshore	Greater than 0.6 and less than or equal to 0.7	6	0.1689994
All geographies	Fishing - offshore	Greater than 0.5 and less than or equal to 0.6	3	0.2055297
All geographies	Fishing - offshore	Greater than 0.4 and less than or equal to 0.5	.	.
All geographies	Fishing - offshore	Greater than 0.3 and less than or equal to 0.4	.	.
All geographies	Fishing - offshore	Less than or equal to 0.3	1	0.0107547
All geographies	Aquaculture - extensive	All levels of dependency	210	0.4410614
All geographies	Aquaculture - extensive	Greater than 0.9 and less than or equal to 1	78	0.7606297
All geographies	Aquaculture - extensive	Greater than 0.8 and less than or equal to 0.9	15	0.4541729
All	Aquaculture - extensive	Greater than 0.7 and less than or equal to 0.8	30	0.324792

Geography	Primary activity	Income dependency on primary activity	Households reporting	Average vulnerability
geographies				
All geographies	Aquaculture - extensive	Greater than 0.6 and less than or equal to 0.7	31	0.2098159
All geographies	Aquaculture - extensive	Greater than 0.5 and less than or equal to 0.6	26	0.2330422
All geographies	Aquaculture - extensive	Greater than 0.4 and less than or equal to 0.5	22	0.1731785
All geographies	Aquaculture - extensive	Greater than 0.3 and less than or equal to 0.4	5	0.0655835
All geographies	Aquaculture - extensive	Less than or equal to 0.3	3	0.0120655
All geographies	Aquaculture - intensive	All levels of dependency	46	0.3052171
All geographies	Aquaculture - intensive	Greater than 0.9 and less than or equal to 1	30	0.389366
All geographies	Aquaculture - intensive	Greater than 0.8 and less than or equal to 0.9	5	0.2082922
All geographies	Aquaculture - intensive	Greater than 0.7 and less than or equal to 0.8	2	0.1125625
All geographies	Aquaculture - intensive	Greater than 0.6 and less than or equal to 0.7	6	0.1070413
All geographies	Aquaculture - intensive	Greater than 0.5 and less than or equal to 0.6	2	0.1908109
All geographies	Aquaculture - intensive	Greater than 0.4 and less than or equal to 0.5	1	0.0685522
All geographies	Aquaculture - intensive	Greater than 0.3 and less than or equal to 0.4	.	.
All geographies	Aquaculture - intensive	Less than or equal to 0.3	.	.
All geographies	Other activities	All levels of dependency	149	0.2071476
All geographies	Other activities	Greater than 0.9 and less than or equal to 1	15	0.3550172

Geography	Primary activity	Income dependency on primary activity	Households reporting	Average vulnerability
All geographies	Other activities	Greater than 0.8 and less than or equal to 0.9	27	0.3121284
All geographies	Other activities	Greater than 0.7 and less than or equal to 0.8	29	0.1922632
All geographies	Other activities	Greater than 0.6 and less than or equal to 0.7	38	0.1793849
All geographies	Other activities	Greater than 0.5 and less than or equal to 0.6	28	0.1318373
All geographies	Other activities	Greater than 0.4 and less than or equal to 0.5	10	0.0933223
All geographies	Other activities	Greater than 0.3 and less than or equal to 0.4	1	0.058235
All geographies	Other activities	Less than or equal to 0.3	1	0.0371008
Dam Doi	All primary activities	All levels of dependency	220	0.3936118
Dam Doi	All primary activities	Greater than 0.9 and less than or equal to 1	86	0.6698509
Dam Doi	All primary activities	Greater than 0.8 and less than or equal to 0.9	19	0.2713645
Dam Doi	All primary activities	Greater than 0.7 and less than or equal to 0.8	29	0.2795423
Dam Doi	All primary activities	Greater than 0.6 and less than or equal to 0.7	30	0.1947496
Dam Doi	All primary activities	Greater than 0.5 and less than or equal to 0.6	39	0.1906814
Dam Doi	All primary activities	Greater than 0.4 and less than or equal to 0.5	15	0.1529081
Dam Doi	All primary activities	Greater than 0.3 and less than or equal to 0.4	2	0.076049
Dam Doi	All primary activities	Less than or equal to 0.3	.	.
Dam Doi	Fishing - nearshore	All levels of dependency	15	0.4414061
Dam Doi	Fishing - nearshore	Greater than 0.9 and less than or equal to 1	12	0.5189442
Dam Doi	Fishing - nearshore	Greater than 0.8 and less than or equal to 0.9	.	.
Dam Doi	Fishing - nearshore	Greater than 0.7 and less than or equal to 0.8	.	.
Dam Doi	Fishing - nearshore	Greater than 0.6 and less than or equal to 0.7	1	0.2014082
Dam Doi	Fishing - nearshore	Greater than 0.5 and less than or equal to 0.6	1	0.1112343
Dam Doi	Fishing - nearshore	Greater than 0.4 and less than or equal to 0.5	1	0.0811192

Geography	Primary activity	Income dependency on primary activity	Households reporting	Average vulnerability
Dam Doi	Fishing - nearshore	Greater than 0.3 and less than or equal to 0.4	.	.
Dam Doi	Fishing - nearshore	Less than or equal to 0.3	.	.
Dam Doi	Fishing - offshore	All levels of dependency	19	0.5365551
Dam Doi	Fishing - offshore	Greater than 0.9 and less than or equal to 1	12	0.7264087
Dam Doi	Fishing - offshore	Greater than 0.8 and less than or equal to 0.9	1	0.1425123
Dam Doi	Fishing - offshore	Greater than 0.7 and less than or equal to 0.8	2	0.2153112
Dam Doi	Fishing - offshore	Greater than 0.6 and less than or equal to 0.7	1	0.2879183
Dam Doi	Fishing - offshore	Greater than 0.5 and less than or equal to 0.6	3	0.2055297
Dam Doi	Fishing - offshore	Greater than 0.4 and less than or equal to 0.5	.	.
Dam Doi	Fishing - offshore	Greater than 0.3 and less than or equal to 0.4	.	.
Dam Doi	Fishing - offshore	Less than or equal to 0.3	.	.
Dam Doi	Aquaculture - extensive	All levels of dependency	77	0.5426469
Dam Doi	Aquaculture - extensive	Greater than 0.9 and less than or equal to 1	30	0.9727364
Dam Doi	Aquaculture - extensive	Greater than 0.8 and less than or equal to 0.9	3	0.4492978
Dam Doi	Aquaculture - extensive	Greater than 0.7 and less than or equal to 0.8	10	0.4487606
Dam Doi	Aquaculture - extensive	Greater than 0.6 and less than or equal to 0.7	7	0.1940357
Dam Doi	Aquaculture - extensive	Greater than 0.5 and less than or equal to 0.6	17	0.2205344
Dam Doi	Aquaculture - extensive	Greater than 0.4 and less than or equal to 0.5	9	0.1738918
Dam Doi	Aquaculture - extensive	Greater than 0.3 and less than or equal to 0.4	1	0.0938631
Dam Doi	Aquaculture - extensive	Less than or equal to 0.3	.	.
Dam Doi	Aquaculture - intensive	All levels of dependency	34	0.324624
Dam Doi	Aquaculture - intensive	Greater than 0.9 and less than or equal to 1	22	0.4339548
Dam Doi	Aquaculture - intensive	Greater than 0.8 and less than or equal to 0.9	2	0.1373305
Dam Doi	Aquaculture - intensive	Greater than 0.7 and less than or equal to 0.8	2	0.1125625
Dam Doi	Aquaculture - intensive	Greater than 0.6 and less than or equal to 0.7	5	0.10805
Dam Doi	Aquaculture - intensive	Greater than 0.5 and less than or equal to 0.6	2	0.1908109
Dam Doi	Aquaculture - intensive	Greater than 0.4 and less than or equal to 0.5	1	0.0685522
Dam Doi	Aquaculture - intensive	Greater than 0.3 and less than or equal to 0.4	.	.

Geography	Primary activity	Income dependency on primary activity	Households reporting	Average vulnerability
Dam Doi	Aquaculture - intensive	Less than or equal to 0.3	.	.
Dam Doi	Other activities	All levels of dependency	75	0.2261059
Dam Doi	Other activities	Greater than 0.9 and less than or equal to 1	10	0.3933841
Dam Doi	Other activities	Greater than 0.8 and less than or equal to 0.9	13	0.2608353
Dam Doi	Other activities	Greater than 0.7 and less than or equal to 0.8	15	0.1975582
Dam Doi	Other activities	Greater than 0.6 and less than or equal to 0.7	16	0.2159164
Dam Doi	Other activities	Greater than 0.5 and less than or equal to 0.6	16	0.1611277
Dam Doi	Other activities	Greater than 0.4 and less than or equal to 0.5	4	0.144731
Dam Doi	Other activities	Greater than 0.3 and less than or equal to 0.4	1	0.058235
Dam Doi	Other activities	Less than or equal to 0.3	.	.
Tran van Thoi	All primary activities	All levels of dependency	179	0.2822569
Tran van Thoi	All primary activities	Greater than 0.9 and less than or equal to 1	89	0.3252572
Tran van Thoi	All primary activities	Greater than 0.8 and less than or equal to 0.9	28	0.3001799
Tran van Thoi	All primary activities	Greater than 0.7 and less than or equal to 0.8	25	0.2321441
Tran van Thoi	All primary activities	Greater than 0.6 and less than or equal to 0.7	17	0.1998937
Tran van Thoi	All primary activities	Greater than 0.5 and less than or equal to 0.6	11	0.1970295
Tran van Thoi	All primary activities	Greater than 0.4 and less than or equal to 0.5	7	0.2366049
Tran van Thoi	All primary activities	Greater than 0.3 and less than or equal to 0.4	1	0.1085911
Tran van Thoi	All primary activities	Less than or equal to 0.3	1	0.0371008
Tran van Thoi	Fishing - nearshore	All levels of dependency	34	0.1659748
Tran van Thoi	Fishing - nearshore	Greater than 0.9 and less than or equal to 1	17	0.1954194
Tran van Thoi	Fishing - nearshore	Greater than 0.8 and less than or equal to 0.9	7	0.1482384
Tran van Thoi	Fishing - nearshore	Greater than 0.7 and less than or equal to 0.8	6	0.1384491
Tran van Thoi	Fishing - nearshore	Greater than 0.6 and less than or equal to 0.7	1	0.1973391
Tran van Thoi	Fishing - nearshore	Greater than 0.5 and less than or equal to 0.6	3	0.0851039
Tran van Thoi	Fishing - nearshore	Greater than 0.4 and less than or equal to 0.5	.	.
Tran van Thoi	Fishing - nearshore	Greater than 0.3 and less than or equal to 0.4	.	.
Tran van Thoi	Fishing - nearshore	Less than or equal to 0.3	.	.

Geography	Primary activity	Income dependency on primary activity	Households reporting	Average vulnerability
Tran van Thoi	Fishing - offshore	All levels of dependency	42	0.0965253
Tran van Thoi	Fishing - offshore	Greater than 0.9 and less than or equal to 1	38	0.1000326
Tran van Thoi	Fishing - offshore	Greater than 0.8 and less than or equal to 0.9	3	0.0459819
Tran van Thoi	Fishing - offshore	Greater than 0.7 and less than or equal to 0.8	.	.
Tran van Thoi	Fishing - offshore	Greater than 0.6 and less than or equal to 0.7	1	0.1148778
Tran van Thoi	Fishing - offshore	Greater than 0.5 and less than or equal to 0.6	.	.
Tran van Thoi	Fishing - offshore	Greater than 0.4 and less than or equal to 0.5	.	.
Tran van Thoi	Fishing - offshore	Greater than 0.3 and less than or equal to 0.4	.	.
Tran van Thoi	Fishing - offshore	Less than or equal to 0.3	.	.
Tran van Thoi	Aquaculture - extensive	All levels of dependency	45	0.6355474
Tran van Thoi	Aquaculture - extensive	Greater than 0.9 and less than or equal to 1	22	0.8428581
Tran van Thoi	Aquaculture - extensive	Greater than 0.8 and less than or equal to 0.9	4	0.7629409
Tran van Thoi	Aquaculture - extensive	Greater than 0.7 and less than or equal to 0.8	7	0.3982538
Tran van Thoi	Aquaculture - extensive	Greater than 0.6 and less than or equal to 0.7	4	0.3371929
Tran van Thoi	Aquaculture - extensive	Greater than 0.5 and less than or equal to 0.6	2	0.6469154
Tran van Thoi	Aquaculture - extensive	Greater than 0.4 and less than or equal to 0.5	5	0.293204
Tran van Thoi	Aquaculture - extensive	Greater than 0.3 and less than or equal to 0.4	1	0.1085911
Tran van Thoi	Aquaculture - extensive	Less than or equal to 0.3	.	.
Tran van Thoi	Aquaculture - intensive	All levels of dependency	12	0.250231
Tran van Thoi	Aquaculture - intensive	Greater than 0.9 and less than or equal to 1	8	0.2667468
Tran van Thoi	Aquaculture - intensive	Greater than 0.8 and less than or equal to 0.9	3	0.2556
Tran van Thoi	Aquaculture - intensive	Greater than 0.7 and less than or equal to 0.8		.
Tran van Thoi	Aquaculture - intensive	Greater than 0.6 and less than or equal to 0.7	1	0.1019977
Tran van Thoi	Aquaculture - intensive	Greater than 0.5 and less than or equal to 0.6	.	.
Tran van Thoi	Aquaculture - intensive	Greater than 0.4 and less than or equal to 0.5	.	.
Tran van Thoi	Aquaculture - intensive	Greater than 0.3 and less than or equal to 0.4	.	.
Tran van Thoi	Aquaculture - intensive	Less than or equal to 0.3	.	.
Tran van Thoi	Other activities	All levels of dependency	46	0.2005297

Geography	Primary activity	Income dependency on primary activity	Households reporting	Average vulnerability
Tran van Thoi	Other activities	Greater than 0.9 and less than or equal to 1	4	0.2869178
Tran van Thoi	Other activities	Greater than 0.8 and less than or equal to 0.9	11	0.3100782
Tran van Thoi	Other activities	Greater than 0.7 and less than or equal to 0.8	12	0.1820944
Tran van Thoi	Other activities	Greater than 0.6 and less than or equal to 0.7	10	0.1635206
Tran van Thoi	Other activities	Greater than 0.5 and less than or equal to 0.6	6	0.1030303
Tran van Thoi	Other activities	Greater than 0.4 and less than or equal to 0.5	2	0.095107
Tran van Thoi	Other activities	Greater than 0.3 and less than or equal to 0.4	.	.
Tran van Thoi	Other activities	Less than or equal to 0.3	1	0.0371008
Hue	All primary activities	All levels of dependency	200	0.2105043
Hue	All primary activities	Greater than 0.9 and less than or equal to 1	42	0.4477569
Hue	All primary activities	Greater than 0.8 and less than or equal to 0.9	17	0.3203891
Hue	All primary activities	Greater than 0.7 and less than or equal to 0.8	21	0.1886978
Hue	All primary activities	Greater than 0.6 and less than or equal to 0.7	56	0.1599059
Hue	All primary activities	Greater than 0.5 and less than or equal to 0.6	20	0.1123812
Hue	All primary activities	Greater than 0.4 and less than or equal to 0.5	32	0.0742531
Hue	All primary activities	Greater than 0.3 and less than or equal to 0.4	8	0.0325489
Hue	All primary activities	Less than or equal to 0.3	4	0.0117378
Hue	Fishing - nearshore	All levels of dependency	78	0.1837468
Hue	Fishing - nearshore	Greater than 0.9 and less than or equal to 1	15	0.4638602
Hue	Fishing - nearshore	Greater than 0.8 and less than or equal to 0.9	6	0.2346549
Hue	Fishing - nearshore	Greater than 0.7 and less than or equal to 0.8	5	0.1685263
Hue	Fishing - nearshore	Greater than 0.6 and less than or equal to 0.7	20	0.1409751
Hue	Fishing - nearshore	Greater than 0.5 and less than or equal to 0.6	7	0.1051748
Hue	Fishing - nearshore	Greater than 0.4 and less than or equal to 0.5	20	0.0716567
Hue	Fishing - nearshore	Greater than 0.3 and less than or equal to 0.4	5	0.0269855
Hue	Fishing - nearshore	Less than or equal to 0.3	.	.
Hue	Fishing - offshore	All levels of dependency	6	0.1410791
Hue	Fishing - offshore	Greater than 0.9 and less than or equal to 1	.	.

Geography	Primary activity	Income dependency on primary activity	Households reporting	Average vulnerability
Hue	Fishing - offshore	Greater than 0.8 and less than or equal to 0.9	.	.
Hue	Fishing - offshore	Greater than 0.7 and less than or equal to 0.8	1	0.2245195
Hue	Fishing - offshore	Greater than 0.6 and less than or equal to 0.7	4	0.1528001
Hue	Fishing - offshore	Greater than 0.5 and less than or equal to 0.6	.	.
Hue	Fishing - offshore	Greater than 0.4 and less than or equal to 0.5	.	.
Hue	Fishing - offshore	Greater than 0.3 and less than or equal to 0.4	.	.
Hue	Fishing - offshore	Less than or equal to 0.3	1	0.0107547
Hue	Aquaculture - extensive	All levels of dependency	88	0.252721
Hue	Aquaculture - extensive	Greater than 0.9 and less than or equal to 1	26	0.4463131
Hue	Aquaculture - extensive	Greater than 0.8 and less than or equal to 0.9	8	0.3016171
Hue	Aquaculture - extensive	Greater than 0.7 and less than or equal to 0.8	13	0.1898751
Hue	Aquaculture - extensive	Greater than 0.6 and less than or equal to 0.7	20	0.1898635
Hue	Aquaculture - extensive	Greater than 0.5 and less than or equal to 0.6	7	0.1451688
Hue	Aquaculture - extensive	Greater than 0.4 and less than or equal to 0.5	8	0.0973602
Hue	Aquaculture - extensive	Greater than 0.3 and less than or equal to 0.4	3	0.0418212
Hue	Aquaculture - extensive	Less than or equal to 0.3	3	0.0120655
Hue	Aquaculture - intensive	All levels of dependency	.	.
Hue	Aquaculture - intensive	Greater than 0.9 and less than or equal to 1	.	.
Hue	Aquaculture - intensive	Greater than 0.8 and less than or equal to 0.9	.	.
Hue	Aquaculture - intensive	Greater than 0.7 and less than or equal to 0.8	.	.
Hue	Aquaculture - intensive	Greater than 0.6 and less than or equal to 0.7	.	.
Hue	Aquaculture - intensive	Greater than 0.5 and less than or equal to 0.6	.	.
Hue	Aquaculture - intensive	Greater than 0.4 and less than or equal to 0.5	.	.
Hue	Aquaculture - intensive	Greater than 0.3 and less than or equal to 0.4	.	.
Hue	Aquaculture - intensive	Less than or equal to 0.3	.	.
Hue	Other activities	All levels of dependency	28	0.1672387
Hue	Other activities	Greater than 0.9 and less than or equal to 1	1	0.2437458
Hue	Other activities	Greater than 0.8 and less than or equal to 0.9	3	0.5419159

Geography	Primary activity	Income dependency on primary activity	Households reporting	Average vulnerability
Hue	Other activities	Greater than 0.7 and less than or equal to 0.8	2	0.2135632
Hue	Other activities	Greater than 0.6 and less than or equal to 0.7	12	0.1438965
Hue	Other activities	Greater than 0.5 and less than or equal to 0.6	6	0.0825366
Hue	Other activities	Greater than 0.4 and less than or equal to 0.5	4	0.0410213
Hue	Other activities	Greater than 0.3 and less than or equal to 0.4	.	.
Hue	Other activities	Less than or equal to 0.3	.	.

Appendix Vc

Vulnerability analysis - Average vulnerability by household income per capita per month by primary activity by district

Geography	Primary activity	Household income per month per capita (VND)	Households reporting	Average vulnerability
All geographies	All primary activities	All levels of income	599	0.2991977
All geographies	All primary activities	Income less than or equal to 300,000	25	1.073976
All geographies	All primary activities	Income greater than 300,000 and less than or equal to 650,000	115	0.4495534
All geographies	All primary activities	Income greater than 650,000 and less than or equal to 1,000,000	116	0.2946456
All geographies	All primary activities	Income greater than 1,000,000 and less than or equal to 1,500,000	115	0.2422019
All geographies	All primary activities	Income greater than 1,500,000 and less than or equal to 2,000,000	65	0.2093494
All geographies	All primary activities	Income greater than 2,000,000 and less than or equal to 3,000,000	53	0.1846263
All geographies	All primary activities	Income greater than 3,000,000 and less than or equal to 4,000,000	26	0.1771342
All geographies	All primary activities	Income greater than 4,000,000 and less than or equal to 5,000,000	15	0.1818515
All geographies	All primary activities	Income greater than 5,000,000 and less than or equal to 6,000,000	15	0.1572456
All geographies	All primary activities	Income greater than 6,000,000 and less than or equal to 7,000,000	7	0.1439826
All geographies	All primary activities	Income greater than 7,000,000 and less than or equal to 8,000,000	3	0.1555108
All geographies	All primary activities	Income greater than 8,000,000 and less than or equal to 9,000,000	5	0.151094

Geography	Primary activity	Household income per month per capita (VND)	Households reporting	Average vulnerability
All geographies	All primary activities	Income greater than 9,000,000 and less than or equal to 10,000,000	4	0.12388
All geographies	All primary activities	Income greater than 10,000,000	35	0.0808298
All geographies	Fishing - nearshore	All levels of income	127	0.2094211
All geographies	Fishing - nearshore	Income less than or equal to 300,000	2	0.6892797
All geographies	Fishing - nearshore	Income greater than 300,000 and less than or equal to 650,000	33	0.3260572
All geographies	Fishing - nearshore	Income greater than 650,000 and less than or equal to 1,000,000	32	0.1741335
All geographies	Fishing - nearshore	Income greater than 1,000,000 and less than or equal to 1,500,000	18	0.1663569
All geographies	Fishing - nearshore	Income greater than 1,500,000 and less than or equal to 2,000,000	10	0.1412231
All geographies	Fishing - nearshore	Income greater than 2,000,000 and less than or equal to 3,000,000	10	0.1358684
All geographies	Fishing - nearshore	Income greater than 3,000,000 and less than or equal to 4,000,000	4	0.1345296
All geographies	Fishing - nearshore	Income greater than 4,000,000 and less than or equal to 5,000,000	3	0.1598175
All geographies	Fishing - nearshore	Income greater than 5,000,000 and less than or equal to 6,000,000	4	0.1419399
All geographies	Fishing - nearshore	Income greater than 6,000,000 and less than or equal to 7,000,000	6	0.1433754
All geographies	Fishing - nearshore	Income greater than 7,000,000 and less than or equal to 8,000,000	.	.
All geographies	Fishing - nearshore	Income greater than 8,000,000 and less than or equal to 9,000,000	1	0.152092
All geographies	Fishing - nearshore	Income greater than 9,000,000 and less than or equal to 10,000,000	2	0.136444
All	Fishing - nearshore	Income greater than 10,000,000	2	0.1249324

Geography	Primary activity	Household income per month per capita (VND)	Households reporting	Average vulnerability
geographies				
All geographies	Fishing - offshore	All levels of income	67	0.2252997
All geographies	Fishing - offshore	Income less than or equal to 300,000	.	.
All geographies	Fishing - offshore	Income greater than 300,000 and less than or equal to 650,000	2	1.150547
All geographies	Fishing - offshore	Income greater than 650,000 and less than or equal to 1,000,000	9	0.4605402
All geographies	Fishing - offshore	Income greater than 1,000,000 and less than or equal to 1,500,000	6	0.4507335
All geographies	Fishing - offshore	Income greater than 1,500,000 and less than or equal to 2,000,000	2	0.4428167
All geographies	Fishing - offshore	Income greater than 2,000,000 and less than or equal to 3,000,000	3	0.163319
All geographies	Fishing - offshore	Income greater than 3,000,000 and less than or equal to 4,000,000	.	.
All geographies	Fishing - offshore	Income greater than 4,000,000 and less than or equal to 5,000,000	3	0.1947825
All geographies	Fishing - offshore	Income greater than 5,000,000 and less than or equal to 6,000,000	4	0.2113286
All geographies	Fishing - offshore	Income greater than 6,000,000 and less than or equal to 7,000,000	.	.
All geographies	Fishing - offshore	Income greater than 7,000,000 and less than or equal to 8,000,000	1	0.1400785
All geographies	Fishing - offshore	Income greater than 8,000,000 and less than or equal to 9,000,000	3	0.1333793
All geographies	Fishing - offshore	Income greater than 9,000,000 and less than or equal to 10,000,000	1	0.0200797
All geographies	Fishing - offshore	Income greater than 10,000,000	33	0.0781569
All geographies	Aquaculture - extensive	All levels of income	210	0.4410614

Geography	Primary activity	Household income per month per capita (VND)	Households reporting	Average vulnerability
All geographies	Aquaculture - extensive	Income less than or equal to 300,000	11	1.831892
All geographies	Aquaculture - extensive	Income greater than 300,000 and less than or equal to 650,000	48	0.5795112
All geographies	Aquaculture - extensive	Income greater than 650,000 and less than or equal to 1,000,000	52	0.3636783
All geographies	Aquaculture - extensive	Income greater than 1,000,000 and less than or equal to 1,500,000	54	0.2943278
All geographies	Aquaculture - extensive	Income greater than 1,500,000 and less than or equal to 2,000,000	16	0.2638364
All geographies	Aquaculture - extensive	Income greater than 2,000,000 and less than or equal to 3,000,000	19	0.2203455
All geographies	Aquaculture - extensive	Income greater than 3,000,000 and less than or equal to 4,000,000	6	0.137809
All geographies	Aquaculture - extensive	Income greater than 4,000,000 and less than or equal to 5,000,000	2	0.2279451
All geographies	Aquaculture - extensive	Income greater than 5,000,000 and less than or equal to 6,000,000	1	0.0122554
All geographies	Aquaculture - extensive	Income greater than 6,000,000 and less than or equal to 7,000,000	1	0.1476262
All geographies	Aquaculture - extensive	Income greater than 7,000,000 and less than or equal to 8,000,000	.	.
All geographies	Aquaculture - extensive	Income greater than 8,000,000 and less than or equal to 9,000,000	.	.
All geographies	Aquaculture - extensive	Income greater than 9,000,000 and less than or equal to 10,000,000	.	.
All geographies	Aquaculture - extensive	Income greater than 10,000,000	.	.
All geographies	Aquaculture - intensive	All levels of income	46	0.3052171
All geographies	Aquaculture - intensive	Income less than or equal to 300,000	1	1.139805
All	Aquaculture - intensive	Income greater than 300,000 and less than or equal to 650,000	4	0.6106858

Geography	Primary activity	Household income per month per capita (VND)	Households reporting	Average vulnerability
geographies				
All geographies	Aquaculture - intensive	Income greater than 650,000 and less than or equal to 1,000,000	3	0.5516576
All geographies	Aquaculture - intensive	Income greater than 1,000,000 and less than or equal to 1,500,000	4	0.2760945
All geographies	Aquaculture - intensive	Income greater than 1,500,000 and less than or equal to 2,000,000	5	0.2741696
All geographies	Aquaculture - intensive	Income greater than 2,000,000 and less than or equal to 3,000,000	11	0.2593615
All geographies	Aquaculture - intensive	Income greater than 3,000,000 and less than or equal to 4,000,000	10	0.219538
All geographies	Aquaculture - intensive	Income greater than 4,000,000 and less than or equal to 5,000,000	4	0.192426
All geographies	Aquaculture - intensive	Income greater than 5,000,000 and less than or equal to 6,000,000	3	0.1132913
All geographies	Aquaculture - intensive	Income greater than 6,000,000 and less than or equal to 7,000,000	.	.
All geographies	Aquaculture - intensive	Income greater than 7,000,000 and less than or equal to 8,000,000	1	0.1693057
All geographies	Aquaculture - intensive	Income greater than 8,000,000 and less than or equal to 9,000,000	.	.
All geographies	Aquaculture - intensive	Income greater than 9,000,000 and less than or equal to 10,000,000	.	.
All geographies	Aquaculture - intensive	Income greater than 10,000,000	.	.
All geographies	Other activities	All levels of income	149	0.2071476
All geographies	Other activities	Income less than or equal to 300,000	11	0.3800189
All geographies	Other activities	Income greater than 300,000 and less than or equal to 650,000	28	0.2992278
All geographies	Other activities	Income greater than 650,000 and less than or equal to 1,000,000	20	0.1947757

Geography	Primary activity	Household income per month per capita (VND)	Households reporting	Average vulnerability
All geographies	Other activities	Income greater than 1,000,000 and less than or equal to 1,500,000	33	0.1562521
All geographies	Other activities	Income greater than 1,500,000 and less than or equal to 2,000,000	32	0.1786756
All geographies	Other activities	Income greater than 2,000,000 and less than or equal to 3,000,000	10	0.0897013
All geographies	Other activities	Income greater than 3,000,000 and less than or equal to 4,000,000	6	0.1741896
All geographies	Other activities	Income greater than 4,000,000 and less than or equal to 5,000,000	3	0.1461259
All geographies	Other activities	Income greater than 5,000,000 and less than or equal to 6,000,000	3	0.1978269
All geographies	Other activities	Income greater than 6,000,000 and less than or equal to 7,000,000	.	.
All geographies	Other activities	Income greater than 7,000,000 and less than or equal to 8,000,000	1	0.1571484
All geographies	Other activities	Income greater than 8,000,000 and less than or equal to 9,000,000	1	0.2032402
All geographies	Other activities	Income greater than 9,000,000 and less than or equal to 10,000,000	1	0.2025524
All geographies	Other activities	Income greater than 10,000,000	.	.
Dam Doi	All primary activities	All levels of income	220	0.3936118
Dam Doi	All primary activities	Income less than or equal to 300,000	17	1.064783
Dam Doi	All primary activities	Income greater than 300,000 and less than or equal to 650,000	51	0.5416204
Dam Doi	All primary activities	Income greater than 650,000 and less than or equal to 1,000,000	40	0.396559
Dam Doi	All primary activities	Income greater than 1,000,000 and less than or equal to 1,500,000	36	0.2834892
Dam Doi	All primary activities	Income greater than 1,500,000 and less than or equal to 2,000,000	20	0.2311929
Dam Doi	All primary activities	Income greater than 2,000,000 and less than or equal to 3,000,000	23	0.1826006
Dam Doi	All primary activities	Income greater than 3,000,000 and less than or equal to 4,000,000	14	0.1777779
Dam Doi	All primary activities	Income greater than 4,000,000 and less than or equal to 5,000,000	9	0.1892292

Geography	Primary activity	Household income per month per capita (VND)	Households reporting	Average vulnerability
Dam Doi	All primary activities	Income greater than 5,000,000 and less than or equal to 6,000,000	6	0.1858068
Dam Doi	All primary activities	Income greater than 6,000,000 and less than or equal to 7,000,000	.	.
Dam Doi	All primary activities	Income greater than 7,000,000 and less than or equal to 8,000,000	2	0.163227
Dam Doi	All primary activities	Income greater than 8,000,000 and less than or equal to 9,000,000	1	0.2032402
Dam Doi	All primary activities	Income greater than 9,000,000 and less than or equal to 10,000,000	.	.
Dam Doi	All primary activities	Income greater than 10,000,000	1	0.1425123
Dam Doi	Fishing - nearshore	All levels of income	15	0.4414061
Dam Doi	Fishing - nearshore	Income less than or equal to 300,000	2	0.6892797
Dam Doi	Fishing - nearshore	Income greater than 300,000 and less than or equal to 650,000	10	0.4438593
Dam Doi	Fishing - nearshore	Income greater than 650,000 and less than or equal to 1,000,000	1	0.4072744
Dam Doi	Fishing - nearshore	Income greater than 1,000,000 and less than or equal to 1,500,000	1	0.3155459
Dam Doi	Fishing - nearshore	Income greater than 1,500,000 and less than or equal to 2,000,000	1	0.0811192
Dam Doi	Fishing - nearshore	Income greater than 2,000,000 and less than or equal to 3,000,000	.	.
Dam Doi	Fishing - nearshore	Income greater than 3,000,000 and less than or equal to 4,000,000	.	.
Dam Doi	Fishing - nearshore	Income greater than 4,000,000 and less than or equal to 5,000,000	.	.
Dam Doi	Fishing - nearshore	Income greater than 5,000,000 and less than or equal to 6,000,000	.	.
Dam Doi	Fishing - nearshore	Income greater than 6,000,000 and less than or equal to 7,000,000	.	.
Dam Doi	Fishing - nearshore	Income greater than 7,000,000 and less than or equal to 8,000,000	.	.
Dam Doi	Fishing - nearshore	Income greater than 8,000,000 and less than or equal to 9,000,000	.	.
Dam Doi	Fishing - nearshore	Income greater than 9,000,000 and less than or equal to 10,000,000	.	.
Dam Doi	Fishing - nearshore	Income greater than 10,000,000	.	.
Dam Doi	Fishing - offshore	All levels of income	19	0.5365551
Dam Doi	Fishing - offshore	Income less than or equal to 300,000	.	.
Dam Doi	Fishing - offshore	Income greater than 300,000 and less than or equal to 650,000	2	1.150547
Dam Doi	Fishing - offshore	Income greater than 650,000 and less than or equal to 1,000,000	6	0.5689698
Dam Doi	Fishing - offshore	Income greater than 1,000,000 and less than or equal to 1,500,000	3	0.7376401
Dam Doi	Fishing - offshore	Income greater than 1,500,000 and less than or equal to 2,000,000	1	0.5999594

Geography	Primary activity	Household income per month per capita (VND)	Households reporting	Average vulnerability
Dam Doi	Fishing - offshore	Income greater than 2,000,000 and less than or equal to 3,000,000	1	0.2404615
Dam Doi	Fishing - offshore	Income greater than 3,000,000 and less than or equal to 4,000,000	.	.
Dam Doi	Fishing - offshore	Income greater than 4,000,000 and less than or equal to 5,000,000	2	0.2347349
Dam Doi	Fishing - offshore	Income greater than 5,000,000 and less than or equal to 6,000,000	3	0.2714367
Dam Doi	Fishing - offshore	Income greater than 6,000,000 and less than or equal to 7,000,000	.	.
Dam Doi	Fishing - offshore	Income greater than 7,000,000 and less than or equal to 8,000,000	.	.
Dam Doi	Fishing - offshore	Income greater than 8,000,000 and less than or equal to 9,000,000	.	.
Dam Doi	Fishing - offshore	Income greater than 9,000,000 and less than or equal to 10,000,000	.	.
Dam Doi	Fishing - offshore	Income greater than 10,000,000	1	0.1425123
Dam Doi	Aquaculture - extensive	All levels of income	77	0.5426469
Dam Doi	Aquaculture - extensive	Income less than or equal to 300,000	5	2.49781
Dam Doi	Aquaculture - extensive	Income greater than 300,000 and less than or equal to 650,000	20	0.6773654
Dam Doi	Aquaculture - extensive	Income greater than 650,000 and less than or equal to 1,000,000	21	0.4210902
Dam Doi	Aquaculture - extensive	Income greater than 1,000,000 and less than or equal to 1,500,000	17	0.2958117
Dam Doi	Aquaculture - extensive	Income greater than 1,500,000 and less than or equal to 2,000,000	2	0.0950427
Dam Doi	Aquaculture - extensive	Income greater than 2,000,000 and less than or equal to 3,000,000	7	0.1337797
Dam Doi	Aquaculture - extensive	Income greater than 3,000,000 and less than or equal to 4,000,000	3	0.0977776
Dam Doi	Aquaculture - extensive	Income greater than 4,000,000 and less than or equal to 5,000,000	2	0.2279451
Dam Doi	Aquaculture - extensive	Income greater than 5,000,000 and less than or equal to 6,000,000	.	.
Dam Doi	Aquaculture - extensive	Income greater than 6,000,000 and less than or equal to 7,000,000	.	.

Geography	Primary activity	Household income per month per capita (VND)	Households reporting	Average vulnerability
Dam Doi	Aquaculture - extensive	Income greater than 7,000,000 and less than or equal to 8,000,000	.	.
Dam Doi	Aquaculture - extensive	Income greater than 8,000,000 and less than or equal to 9,000,000	.	.
Dam Doi	Aquaculture - extensive	Income greater than 9,000,000 and less than or equal to 10,000,000	.	.
Dam Doi	Aquaculture - extensive	Income greater than 10,000,000	.	.
Dam Doi	Aquaculture - intensive	All levels of income	34	0.324624
Dam Doi	Aquaculture - intensive	Income less than or equal to 300,000	1	1.139805
Dam Doi	Aquaculture - intensive	Income greater than 300,000 and less than or equal to 650,000	3	0.6720798
Dam Doi	Aquaculture - intensive	Income greater than 650,000 and less than or equal to 1,000,000	2	0.5918049
Dam Doi	Aquaculture - intensive	Income greater than 1,000,000 and less than or equal to 1,500,000	3	0.2652519
Dam Doi	Aquaculture - intensive	Income greater than 1,500,000 and less than or equal to 2,000,000	5	0.2741696
Dam Doi	Aquaculture - intensive	Income greater than 2,000,000 and less than or equal to 3,000,000	9	0.2728941
Dam Doi	Aquaculture - intensive	Income greater than 3,000,000 and less than or equal to 4,000,000	5	0.2300842
Dam Doi	Aquaculture - intensive	Income greater than 4,000,000 and less than or equal to 5,000,000	3	0.1993791
Dam Doi	Aquaculture - intensive	Income greater than 5,000,000 and less than or equal to 6,000,000	2	0.0785233
Dam Doi	Aquaculture - intensive	Income greater than 6,000,000 and less than or equal to 7,000,000	.	.
Dam Doi	Aquaculture - intensive	Income greater than 7,000,000 and less than or equal to 8,000,000	1	0.1693057
Dam Doi	Aquaculture - intensive	Income greater than 8,000,000 and less than or equal to 9,000,000	.	.
Dam Doi	Aquaculture - intensive	Income greater than 9,000,000 and less than or equal to 10,000,000	.	.
Dam Doi	Aquaculture - intensive	Income greater than 10,000,000	.	.
Dam Doi	Other activities	All levels of income	75	0.2261059
Dam Doi	Other activities	Income less than or equal to 300,000	9	0.3437673
Dam Doi	Other activities	Income greater than 300,000 and less than or equal to 650,000	16	0.3324631
Dam Doi	Other activities	Income greater than 650,000 and less than or equal to 1,000,000	10	0.2014764
Dam Doi	Other activities	Income greater than 1,000,000 and less than or equal to 1,500,000	12	0.1543825
Dam Doi	Other activities	Income greater than 1,500,000 and less than or equal to 2,000,000	11	0.2165314

Geography	Primary activity	Household income per month per capita (VND)	Households reporting	Average vulnerability
Dam Doi	Other activities	Income greater than 2,000,000 and less than or equal to 3,000,000	6	0.0944748
Dam Doi	Other activities	Income greater than 3,000,000 and less than or equal to 4,000,000	6	0.1741896
Dam Doi	Other activities	Income greater than 4,000,000 and less than or equal to 5,000,000	2	0.0897829
Dam Doi	Other activities	Income greater than 5,000,000 and less than or equal to 6,000,000	1	0.1434843
Dam Doi	Other activities	Income greater than 6,000,000 and less than or equal to 7,000,000	.	.
Dam Doi	Other activities	Income greater than 7,000,000 and less than or equal to 8,000,000	1	0.1571484
Dam Doi	Other activities	Income greater than 8,000,000 and less than or equal to 9,000,000	1	0.2032402
Dam Doi	Other activities	Income greater than 9,000,000 and less than or equal to 10,000,000	.	.
Dam Doi	Other activities	Income greater than 10,000,000	.	.
Tran van Thoi	All primary activities	All levels of income	179	0.2822569
Tran van Thoi	All primary activities	Income less than or equal to 300,000	7	1.110104
Tran van Thoi	All primary activities	Income greater than 300,000 and less than or equal to 650,000	16	0.6459542
Tran van Thoi	All primary activities	Income greater than 650,000 and less than or equal to 1,000,000	16	0.4196551
Tran van Thoi	All primary activities	Income greater than 1,000,000 and less than or equal to 1,500,000	21	0.3325395
Tran van Thoi	All primary activities	Income greater than 1,500,000 and less than or equal to 2,000,000	29	0.2157986
Tran van Thoi	All primary activities	Income greater than 2,000,000 and less than or equal to 3,000,000	17	0.2143511
Tran van Thoi	All primary activities	Income greater than 3,000,000 and less than or equal to 4,000,000	9	0.1866122
Tran van Thoi	All primary activities	Income greater than 4,000,000 and less than or equal to 5,000,000	6	0.1707849
Tran van Thoi	All primary activities	Income greater than 5,000,000 and less than or equal to 6,000,000	8	0.1539484
Tran van Thoi	All primary activities	Income greater than 6,000,000 and less than or equal to 7,000,000	7	0.1439826
Tran van Thoi	All primary activities	Income greater than 7,000,000 and less than or equal to 8,000,000	1	0.1400785
Tran van Thoi	All primary activities	Income greater than 8,000,000 and less than or equal to 9,000,000	4	0.1380575
Tran van Thoi	All primary activities	Income greater than 9,000,000 and less than or equal to 10,000,000	4	0.12388
Tran van Thoi	All primary activities	Income greater than 10,000,000	34	0.0790156
Tran van Thoi	Fishing - nearshore	All levels of income	34	0.1659748
Tran van Thoi	Fishing - nearshore	Income less than or equal to 300,000	.	.
Tran van Thoi	Fishing - nearshore	Income greater than 300,000 and less than or equal to 650,000	.	.

Geography	Primary activity	Household income per month per capita (VND)	Households reporting	Average vulnerability
Tran van Thoi	Fishing - nearshore	Income greater than 650,000 and less than or equal to 1,000,000	1	0.1973391
Tran van Thoi	Fishing - nearshore	Income greater than 1,000,000 and less than or equal to 1,500,000	2	0.2346785
Tran van Thoi	Fishing - nearshore	Income greater than 1,500,000 and less than or equal to 2,000,000	4	0.2008531
Tran van Thoi	Fishing - nearshore	Income greater than 2,000,000 and less than or equal to 3,000,000	6	0.1836932
Tran van Thoi	Fishing - nearshore	Income greater than 3,000,000 and less than or equal to 4,000,000	3	0.1628555
Tran van Thoi	Fishing - nearshore	Income greater than 4,000,000 and less than or equal to 5,000,000	3	0.1598175
Tran van Thoi	Fishing - nearshore	Income greater than 5,000,000 and less than or equal to 6,000,000	4	0.1419399
Tran van Thoi	Fishing - nearshore	Income greater than 6,000,000 and less than or equal to 7,000,000	6	0.1433754
Tran van Thoi	Fishing - nearshore	Income greater than 7,000,000 and less than or equal to 8,000,000	.	.
Tran van Thoi	Fishing - nearshore	Income greater than 8,000,000 and less than or equal to 9,000,000	1	0.152092
Tran van Thoi	Fishing - nearshore	Income greater than 9,000,000 and less than or equal to 10,000,000	2	0.136444
Tran van Thoi	Fishing - nearshore	Income greater than 10,000,000	2	0.1249324
Tran van Thoi	Fishing - offshore	All levels of income	42	0.0965253
Tran van Thoi	Fishing - offshore	Income less than or equal to 300,000	.	.
Tran van Thoi	Fishing - offshore	Income greater than 300,000 and less than or equal to 650,000	.	.
Tran van Thoi	Fishing - offshore	Income greater than 650,000 and less than or equal to 1,000,000	1	0.3868043
Tran van Thoi	Fishing - offshore	Income greater than 1,000,000 and less than or equal to 1,500,000	.	.
Tran van Thoi	Fishing - offshore	Income greater than 1,500,000 and less than or equal to 2,000,000	1	0.2856739
Tran van Thoi	Fishing - offshore	Income greater than 2,000,000 and less than or equal to 3,000,000	1	0.2387408
Tran van Thoi	Fishing - offshore	Income greater than 3,000,000 and less than or equal to 4,000,000	.	.
Tran van Thoi	Fishing - offshore	Income greater than 4,000,000 and less than or equal to 5,000,000	1	0.1148778
Tran van Thoi	Fishing - offshore	Income greater than 5,000,000 and less than or equal to 6,000,000	1	0.0310043
Tran van Thoi	Fishing - offshore	Income greater than 6,000,000 and less than or equal to 7,000,000	.	.
Tran van Thoi	Fishing - offshore	Income greater than 7,000,000 and less than or equal to 8,000,000	1	0.1400785
Tran van Thoi	Fishing - offshore	Income greater than 8,000,000 and less than or equal to 9,000,000	3	0.1333793
Tran van Thoi	Fishing - offshore	Income greater than 9,000,000 and less than or equal to 10,000,000	1	0.0200797
Tran van Thoi	Fishing - offshore	Income greater than 10,000,000	32	0.0761458

Geography	Primary activity	Household income per month per capita (VND)	Households reporting	Average vulnerability
Tran van Thoi	Aquaculture - extensive	All levels of income	45	0.6355474
Tran van Thoi	Aquaculture - extensive	Income less than or equal to 300,000	5	1.336885
Tran van Thoi	Aquaculture - extensive	Income greater than 300,000 and less than or equal to 650,000	12	0.7443544
Tran van Thoi	Aquaculture - extensive	Income greater than 650,000 and less than or equal to 1,000,000	8	0.605759
Tran van Thoi	Aquaculture - extensive	Income greater than 1,000,000 and less than or equal to 1,500,000	8	0.5266851
Tran van Thoi	Aquaculture - extensive	Income greater than 1,500,000 and less than or equal to 2,000,000	5	0.4006746
Tran van Thoi	Aquaculture - extensive	Income greater than 2,000,000 and less than or equal to 3,000,000	5	0.3252838
Tran van Thoi	Aquaculture - extensive	Income greater than 3,000,000 and less than or equal to 4,000,000	1	0.1459844
Tran van Thoi	Aquaculture - extensive	Income greater than 4,000,000 and less than or equal to 5,000,000	.	.
Tran van Thoi	Aquaculture - extensive	Income greater than 5,000,000 and less than or equal to 6,000,000	.	.
Tran van Thoi	Aquaculture - extensive	Income greater than 6,000,000 and less than or equal to 7,000,000	1	0.1476262
Tran van Thoi	Aquaculture - extensive	Income greater than 7,000,000 and less than or equal to 8,000,000	.	.
Tran van Thoi	Aquaculture - extensive	Income greater than 8,000,000 and less than or equal to 9,000,000	.	.
Tran van Thoi	Aquaculture - extensive	Income greater than 9,000,000 and less than or equal to 10,000,000	.	.
Tran van Thoi	Aquaculture - extensive	Income greater than 10,000,000	.	.
Tran van Thoi	Aquaculture - intensive	All levels of income	12	0.250231
Tran van Thoi	Aquaculture - intensive	Income less than or equal to 300,000	.	.

Geography	Primary activity	Household income per month per capita (VND)	Households reporting	Average vulnerability
Tran van Thoi	Aquaculture - intensive	Income greater than 300,000 and less than or equal to 650,000	1	0.4265038
Tran van Thoi	Aquaculture - intensive	Income greater than 650,000 and less than or equal to 1,000,000	1	0.4713631
Tran van Thoi	Aquaculture - intensive	Income greater than 1,000,000 and less than or equal to 1,500,000	1	0.3086223
Tran van Thoi	Aquaculture - intensive	Income greater than 1,500,000 and less than or equal to 2,000,000	.	.
Tran van Thoi	Aquaculture - intensive	Income greater than 2,000,000 and less than or equal to 3,000,000	2	0.1984649
Tran van Thoi	Aquaculture - intensive	Income greater than 3,000,000 and less than or equal to 4,000,000	5	0.2089918
Tran van Thoi	Aquaculture - intensive	Income greater than 4,000,000 and less than or equal to 5,000,000	1	0.1715668
Tran van Thoi	Aquaculture - intensive	Income greater than 5,000,000 and less than or equal to 6,000,000	1	0.1828272
Tran van Thoi	Aquaculture - intensive	Income greater than 6,000,000 and less than or equal to 7,000,000	.	.
Tran van Thoi	Aquaculture - intensive	Income greater than 7,000,000 and less than or equal to 8,000,000	.	.
Tran van Thoi	Aquaculture - intensive	Income greater than 8,000,000 and less than or equal to 9,000,000	.	.
Tran van Thoi	Aquaculture - intensive	Income greater than 9,000,000 and less than or equal to 10,000,000	.	.
Tran van Thoi	Aquaculture - intensive	Income greater than 10,000,000	.	.
Tran van Thoi	Other activities	All levels of income	46	0.2005297
Tran van Thoi	Other activities	Income less than or equal to 300,000	2	0.5431514
Tran van Thoi	Other activities	Income greater than 300,000 and less than or equal to 650,000	3	0.3255036
Tran van Thoi	Other activities	Income greater than 650,000 and less than or equal to 1,000,000	5	0.1625806
Tran van Thoi	Other activities	Income greater than 1,000,000 and less than or equal to 1,500,000	10	0.199187
Tran van Thoi	Other activities	Income greater than 1,500,000 and less than or equal to 2,000,000	19	0.1666158
Tran van Thoi	Other activities	Income greater than 2,000,000 and less than or equal to 3,000,000	3	0.0932399
Tran van Thoi	Other activities	Income greater than 3,000,000 and less than or equal to 4,000,000	.	.
Tran van Thoi	Other activities	Income greater than 4,000,000 and less than or equal to 5,000,000	1	0.2588119
Tran van Thoi	Other activities	Income greater than 5,000,000 and less than or equal to 6,000,000	2	0.2249983
Tran van Thoi	Other activities	Income greater than 6,000,000 and less than or equal to 7,000,000	.	.
Tran van Thoi	Other activities	Income greater than 7,000,000 and less than or equal to 8,000,000	.	.
Tran van Thoi	Other activities	Income greater than 8,000,000 and less than or equal to 9,000,000	.	.
Tran van Thoi	Other activities	Income greater than 9,000,000 and less than or equal to 10,000,000	1	0.2025524

Geography	Primary activity	Household income per month per capita (VND)	Households reporting	Average vulnerability
Tran van Thoi	Other activities	Income greater than 10,000,000	.	.
Hue	All primary activities	All levels of income	200	0.2105043
Hue	All primary activities	Income less than or equal to 300,000	1	0.9773402
Hue	All primary activities	Income greater than 300,000 and less than or equal to 650,000	48	0.2862653
Hue	All primary activities	Income greater than 650,000 and less than or equal to 1,000,000	60	0.1933675
Hue	All primary activities	Income greater than 1,000,000 and less than or equal to 1,500,000	58	0.1838669
Hue	All primary activities	Income greater than 1,500,000 and less than or equal to 2,000,000	16	0.170356
Hue	All primary activities	Income greater than 2,000,000 and less than or equal to 3,000,000	13	0.1493393
Hue	All primary activities	Income greater than 3,000,000 and less than or equal to 4,000,000	3	0.1456963
Hue	All primary activities	Income greater than 4,000,000 and less than or equal to 5,000,000	.	.
Hue	All primary activities	Income greater than 5,000,000 and less than or equal to 6,000,000	1	0.0122554
Hue	All primary activities	Income greater than 6,000,000 and less than or equal to 7,000,000	.	.
Hue	All primary activities	Income greater than 7,000,000 and less than or equal to 8,000,000	.	.
Hue	All primary activities	Income greater than 8,000,000 and less than or equal to 9,000,000	.	.
Hue	All primary activities	Income greater than 9,000,000 and less than or equal to 10,000,000	.	.
Hue	All primary activities	Income greater than 10,000,000	.	.
Hue	Fishing - nearshore	All levels of income	78	0.1837468
Hue	Fishing - nearshore	Income less than or equal to 300,000	.	.
Hue	Fishing - nearshore	Income greater than 300,000 and less than or equal to 650,000	23	0.2748389
Hue	Fishing - nearshore	Income greater than 650,000 and less than or equal to 1,000,000	30	0.1655886
Hue	Fishing - nearshore	Income greater than 1,000,000 and less than or equal to 1,500,000	15	0.1473014
Hue	Fishing - nearshore	Income greater than 1,500,000 and less than or equal to 2,000,000	5	0.1055398
Hue	Fishing - nearshore	Income greater than 2,000,000 and less than or equal to 3,000,000	4	0.0641312
Hue	Fishing - nearshore	Income greater than 3,000,000 and less than or equal to 4,000,000	1	0.049552
Hue	Fishing - nearshore	Income greater than 4,000,000 and less than or equal to 5,000,000	.	.
Hue	Fishing - nearshore	Income greater than 5,000,000 and less than or equal to 6,000,000	.	.
Hue	Fishing - nearshore	Income greater than 6,000,000 and less than or equal to 7,000,000	.	.

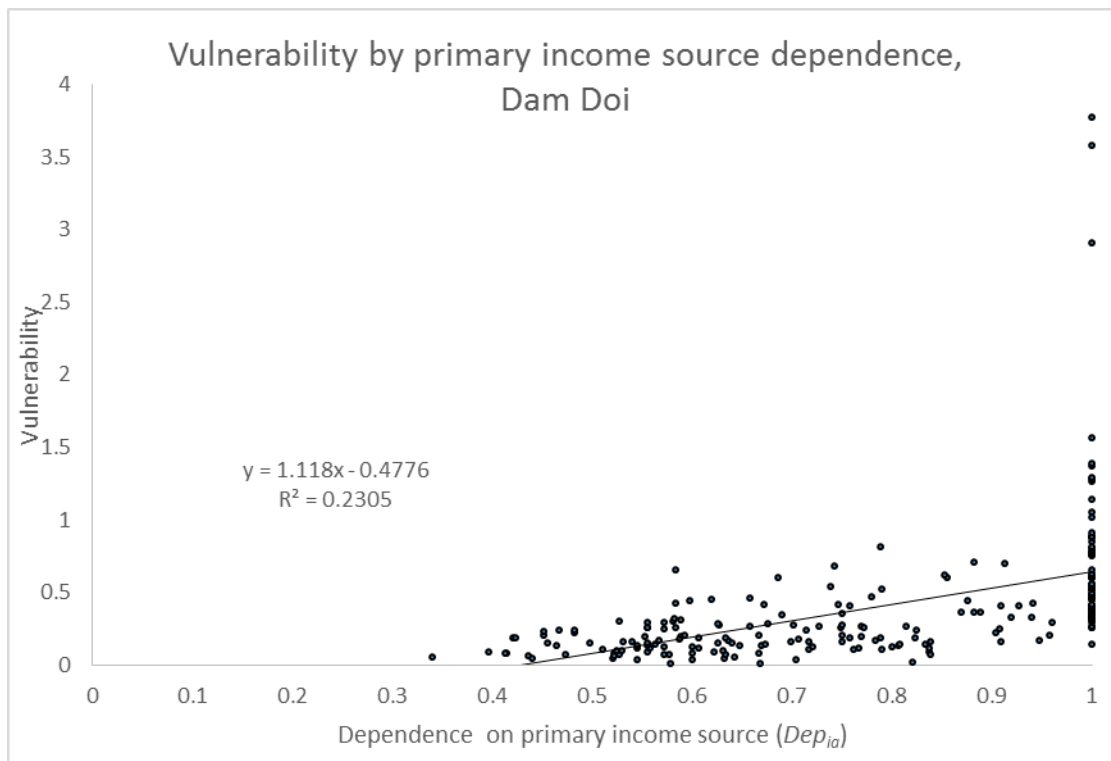
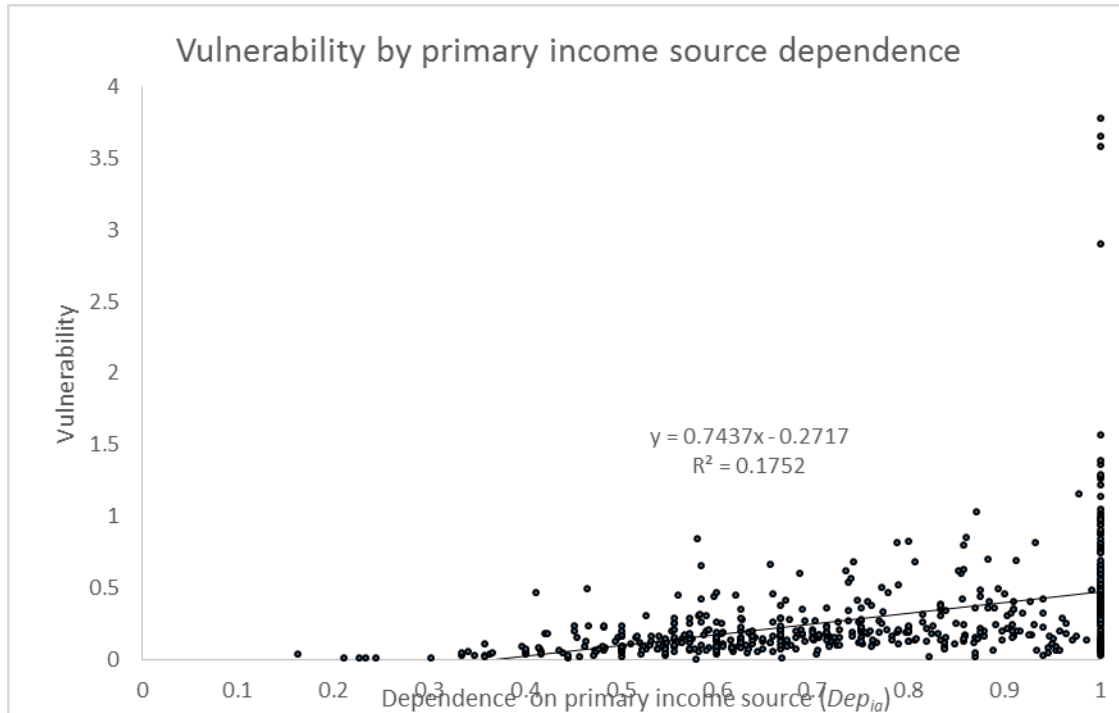
Geography	Primary activity	Household income per month per capita (VND)	Households reporting	Average vulnerability
Hue	Fishing - nearshore	Income greater than 7,000,000 and less than or equal to 8,000,000	.	.
Hue	Fishing - nearshore	Income greater than 8,000,000 and less than or equal to 9,000,000	.	.
Hue	Fishing - nearshore	Income greater than 9,000,000 and less than or equal to 10,000,000	.	.
Hue	Fishing - nearshore	Income greater than 10,000,000	.	.
Hue	Fishing - offshore	All levels of income	6	0.1410791
Hue	Fishing - offshore	Income less than or equal to 300,000	.	.
Hue	Fishing - offshore	Income greater than 300,000 and less than or equal to 650,000	.	.
Hue	Fishing - offshore	Income greater than 650,000 and less than or equal to 1,000,000	2	0.1721195
Hue	Fishing - offshore	Income greater than 1,000,000 and less than or equal to 1,500,000	3	0.1638269
Hue	Fishing - offshore	Income greater than 1,500,000 and less than or equal to 2,000,000	.	.
Hue	Fishing - offshore	Income greater than 2,000,000 and less than or equal to 3,000,000	1	0.0107547
Hue	Fishing - offshore	Income greater than 3,000,000 and less than or equal to 4,000,000	.	.
Hue	Fishing - offshore	Income greater than 4,000,000 and less than or equal to 5,000,000	.	.
Hue	Fishing - offshore	Income greater than 5,000,000 and less than or equal to 6,000,000	.	.
Hue	Fishing - offshore	Income greater than 6,000,000 and less than or equal to 7,000,000	.	.
Hue	Fishing - offshore	Income greater than 7,000,000 and less than or equal to 8,000,000	.	.
Hue	Fishing - offshore	Income greater than 8,000,000 and less than or equal to 9,000,000	.	.
Hue	Fishing - offshore	Income greater than 9,000,000 and less than or equal to 10,000,000	.	.
Hue	Fishing - offshore	Income greater than 10,000,000	.	.
Hue	Aquaculture - extensive	All levels of income	88	0.252721
Hue	Aquaculture - extensive	Income less than or equal to 300,000	1	0.9773402
Hue	Aquaculture - extensive	Income greater than 300,000 and less than or equal to 650,000	16	0.3335612
Hue	Aquaculture - extensive	Income greater than 650,000 and less than or equal to 1,000,000	23	0.2270568
Hue	Aquaculture - extensive	Income greater than 1,000,000 and less than or equal to 1,500,000	29	0.2293593

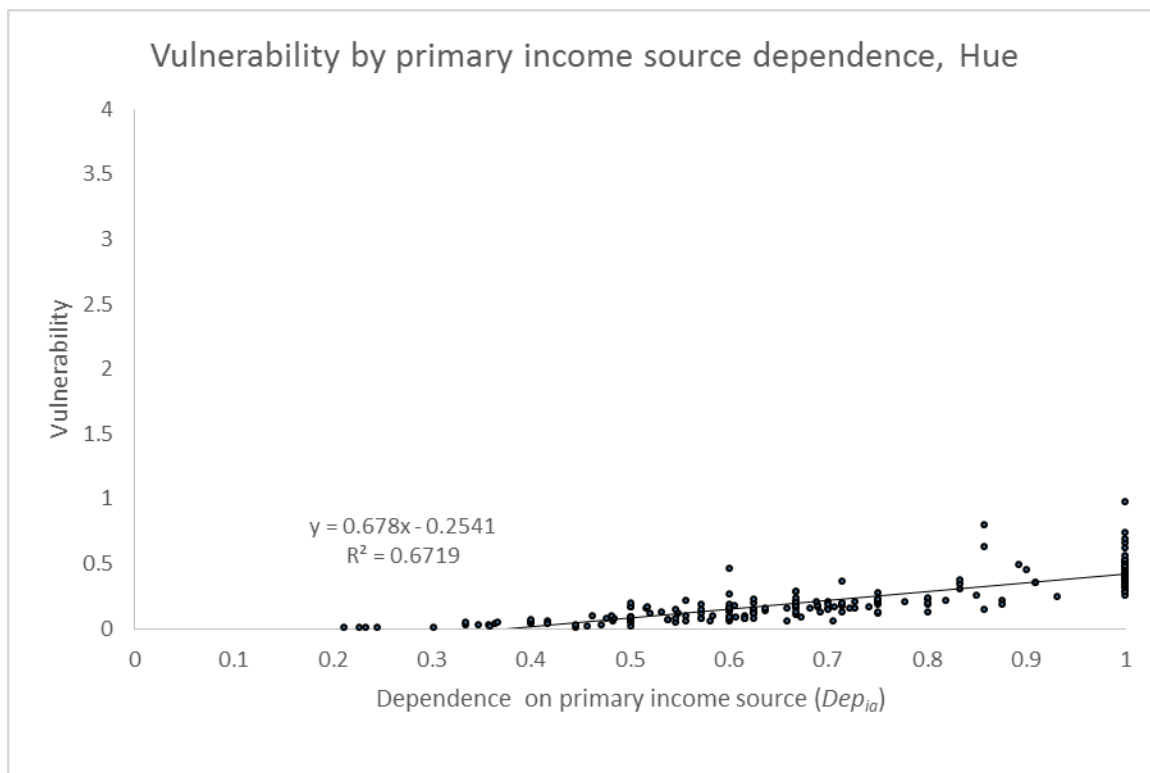
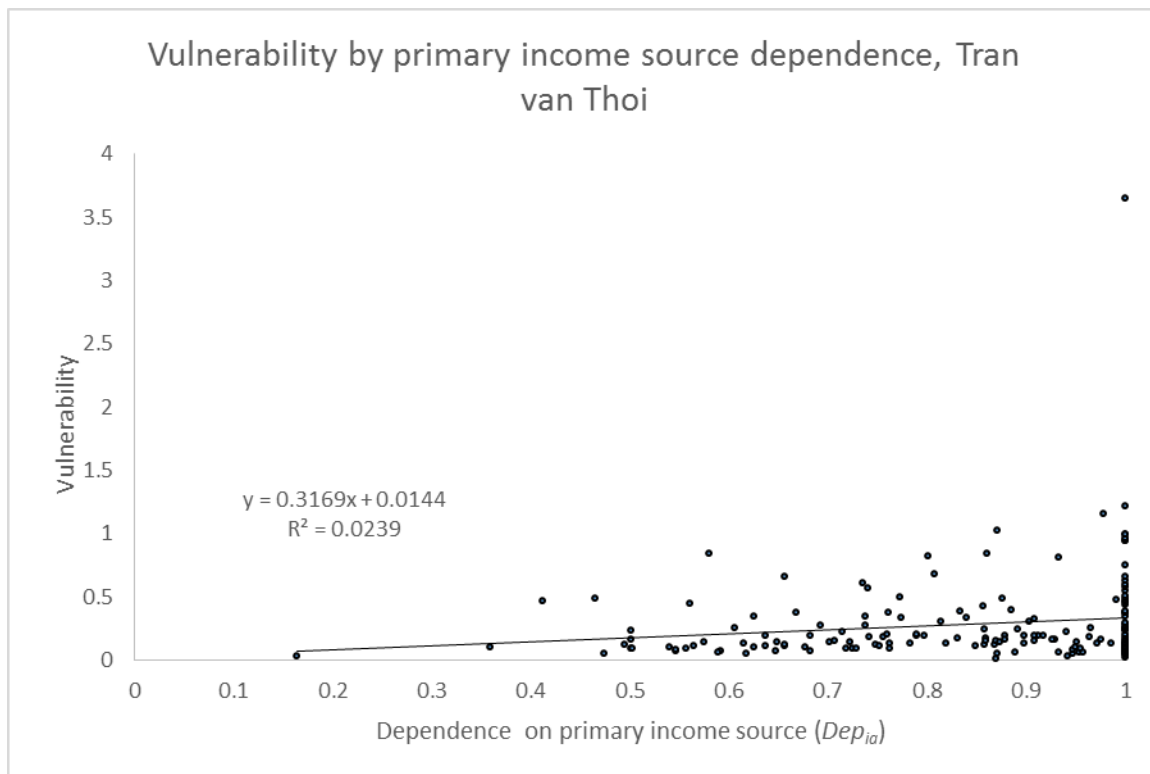
Geography	Primary activity	Household income per month per capita (VND)	Households reporting	Average vulnerability
Hue	Aquaculture - extensive	Income greater than 1,500,000 and less than or equal to 2,000,000	9	0.2253248
Hue	Aquaculture - extensive	Income greater than 2,000,000 and less than or equal to 3,000,000	7	0.2319553
Hue	Aquaculture - extensive	Income greater than 3,000,000 and less than or equal to 4,000,000	2	0.1937684
Hue	Aquaculture - extensive	Income greater than 4,000,000 and less than or equal to 5,000,000	.	.
Hue	Aquaculture - extensive	Income greater than 5,000,000 and less than or equal to 6,000,000	1	0.0122554
Hue	Aquaculture - extensive	Income greater than 6,000,000 and less than or equal to 7,000,000	.	.
Hue	Aquaculture - extensive	Income greater than 7,000,000 and less than or equal to 8,000,000	.	.
Hue	Aquaculture - extensive	Income greater than 8,000,000 and less than or equal to 9,000,000	.	.
Hue	Aquaculture - extensive	Income greater than 9,000,000 and less than or equal to 10,000,000	.	.
Hue	Aquaculture - extensive	Income greater than 10,000,000	.	.
Hue	Aquaculture - intensive	All levels of income	.	.
Hue	Aquaculture - intensive	Income less than or equal to 300,000	.	.
Hue	Aquaculture - intensive	Income greater than 300,000 and less than or equal to 650,000	.	.
Hue	Aquaculture - intensive	Income greater than 650,000 and less than or equal to 1,000,000	.	.
Hue	Aquaculture - intensive	Income greater than 1,000,000 and less than or equal to 1,500,000	.	.
Hue	Aquaculture - intensive	Income greater than 1,500,000 and less than or equal to 2,000,000	.	.
Hue	Aquaculture - intensive	Income greater than 2,000,000 and less than or equal to 3,000,000	.	.
Hue	Aquaculture - intensive	Income greater than 3,000,000 and less than or equal to 4,000,000	.	.
Hue	Aquaculture - intensive	Income greater than 4,000,000 and less than or equal to 5,000,000	.	.
Hue	Aquaculture - intensive	Income greater than 5,000,000 and less than or equal to 6,000,000	.	.
Hue	Aquaculture - intensive	Income greater than 6,000,000 and less than or equal to 7,000,000	.	.

Geography	Primary activity	Household income per month per capita (VND)	Households reporting	Average vulnerability
Hue	Aquaculture - intensive	Income greater than 7,000,000 and less than or equal to 8,000,000	.	.
Hue	Aquaculture - intensive	Income greater than 8,000,000 and less than or equal to 9,000,000	.	.
Hue	Aquaculture - intensive	Income greater than 9,000,000 and less than or equal to 10,000,000	.	.
Hue	Aquaculture - intensive	Income greater than 10,000,000	.	.
Hue	Other activities	All levels of income	28	0.1672387
Hue	Other activities	Income less than or equal to 300,000	.	.
Hue	Other activities	Income greater than 300,000 and less than or equal to 650,000	9	0.2313842
Hue	Other activities	Income greater than 650,000 and less than or equal to 1,000,000	5	0.2135694
Hue	Other activities	Income greater than 1,000,000 and less than or equal to 1,500,000	11	0.11926
Hue	Other activities	Income greater than 1,500,000 and less than or equal to 2,000,000	2	0.0850369
Hue	Other activities	Income greater than 2,000,000 and less than or equal to 3,000,000	1	0.0504444
Hue	Other activities	Income greater than 3,000,000 and less than or equal to 4,000,000	.	.
Hue	Other activities	Income greater than 4,000,000 and less than or equal to 5,000,000	.	.
Hue	Other activities	Income greater than 5,000,000 and less than or equal to 6,000,000	.	.
Hue	Other activities	Income greater than 6,000,000 and less than or equal to 7,000,000	.	.
Hue	Other activities	Income greater than 7,000,000 and less than or equal to 8,000,000	.	.
Hue	Other activities	Income greater than 8,000,000 and less than or equal to 9,000,000	.	.
Hue	Other activities	Income greater than 9,000,000 and less than or equal to 10,000,000	.	.
Hue	Other activities	Income greater than 10,000,000	.	.

Appendix Vd

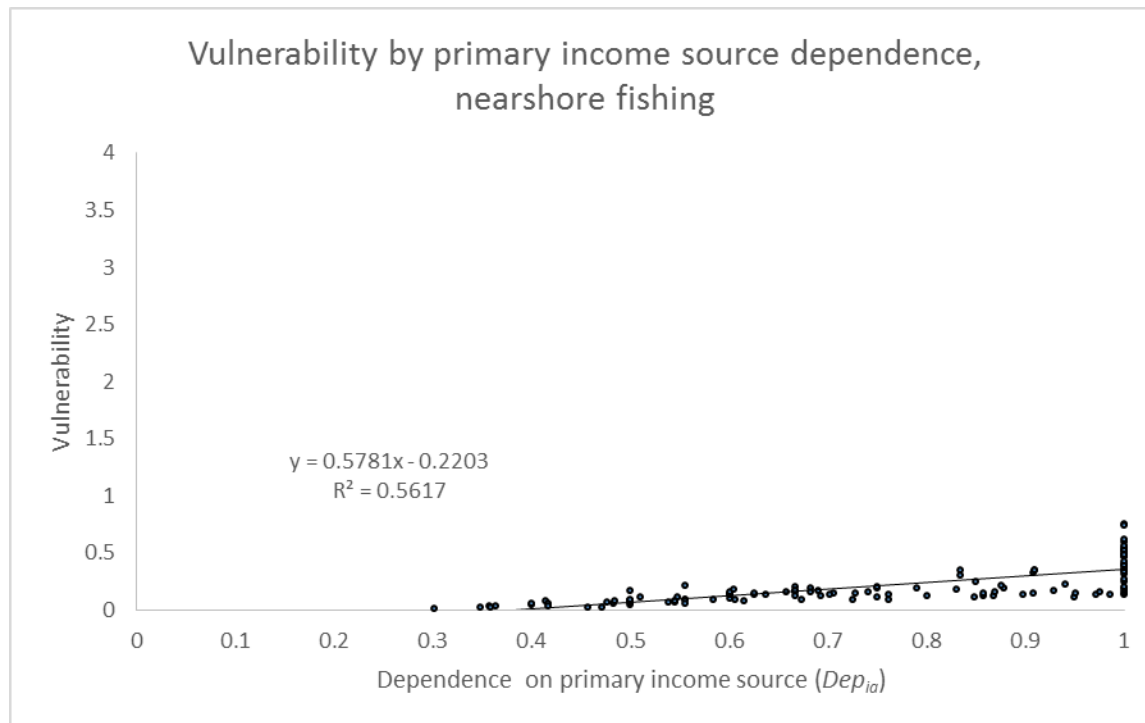
Vulnerability analysis – Simple linear regression of vulnerability by primary income source dependence by district

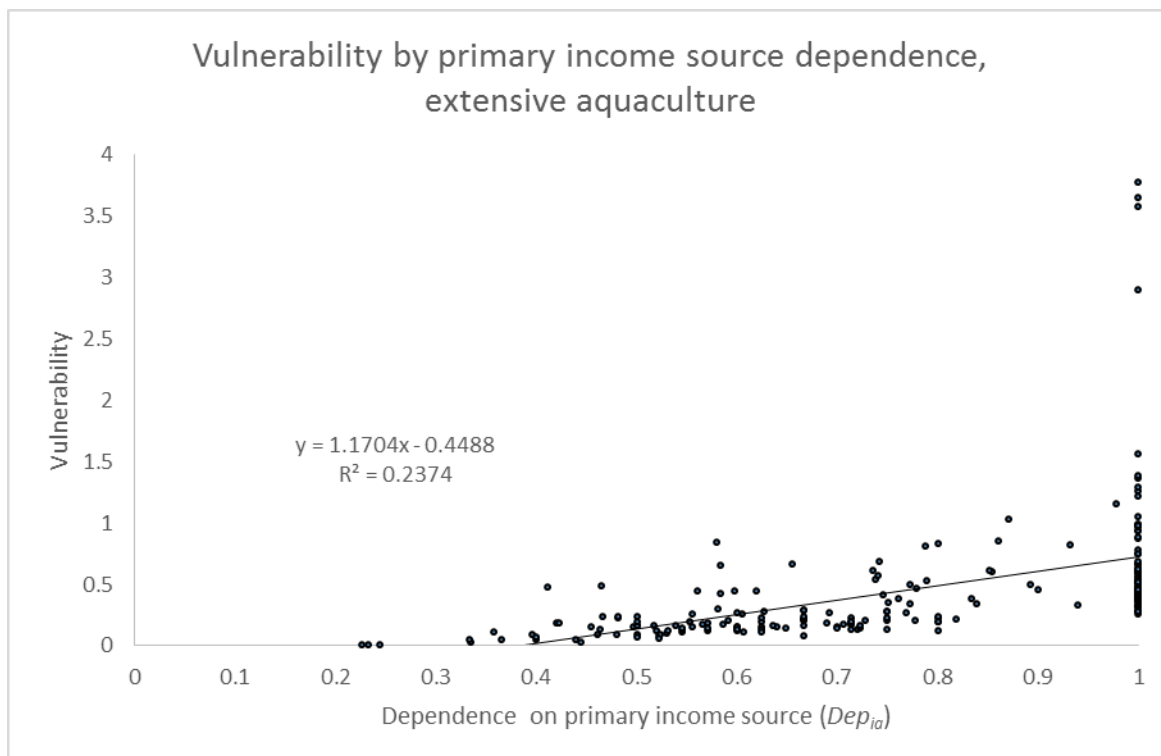
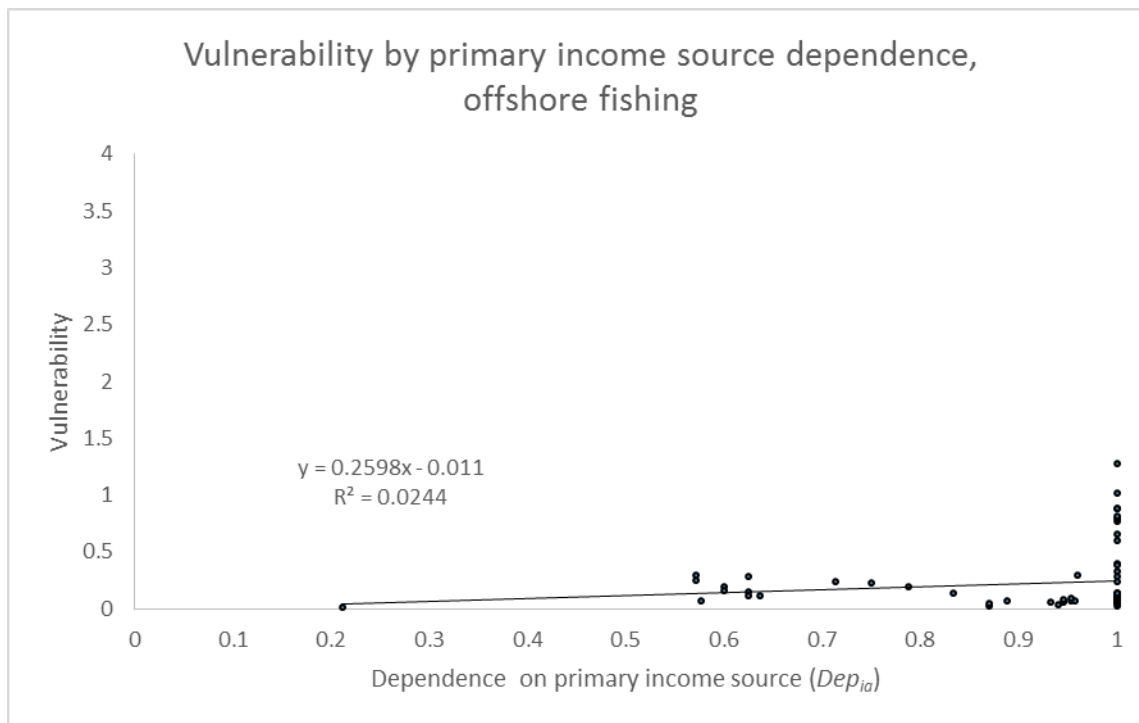


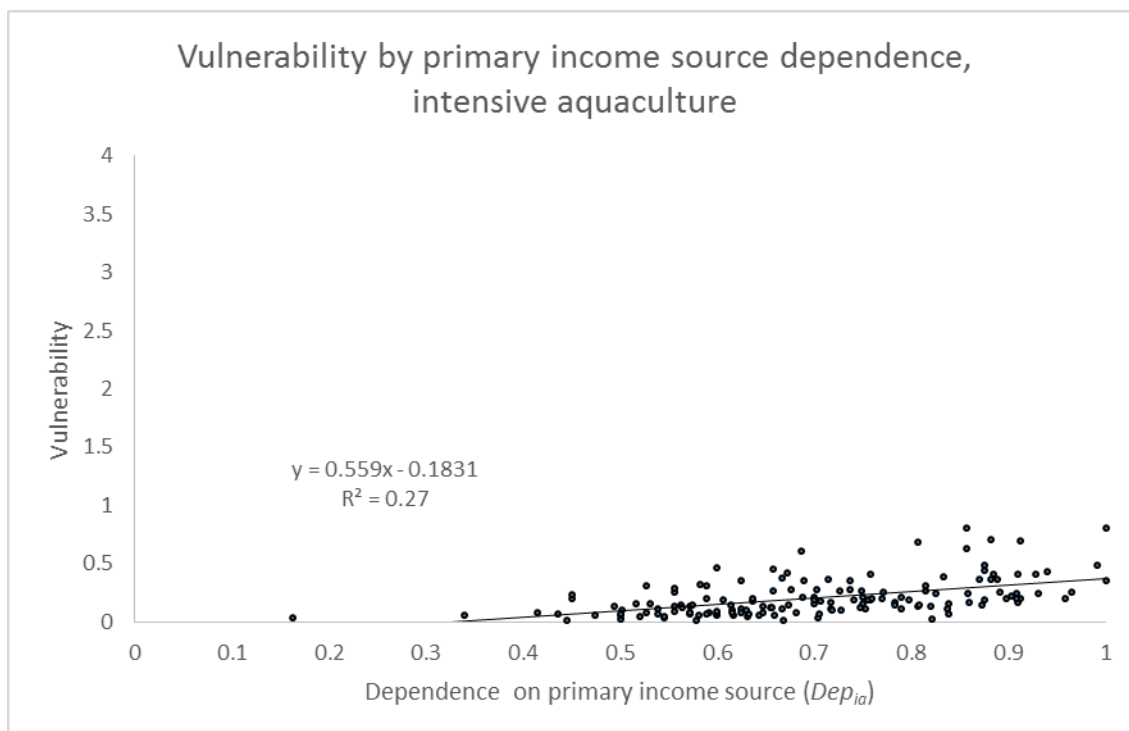
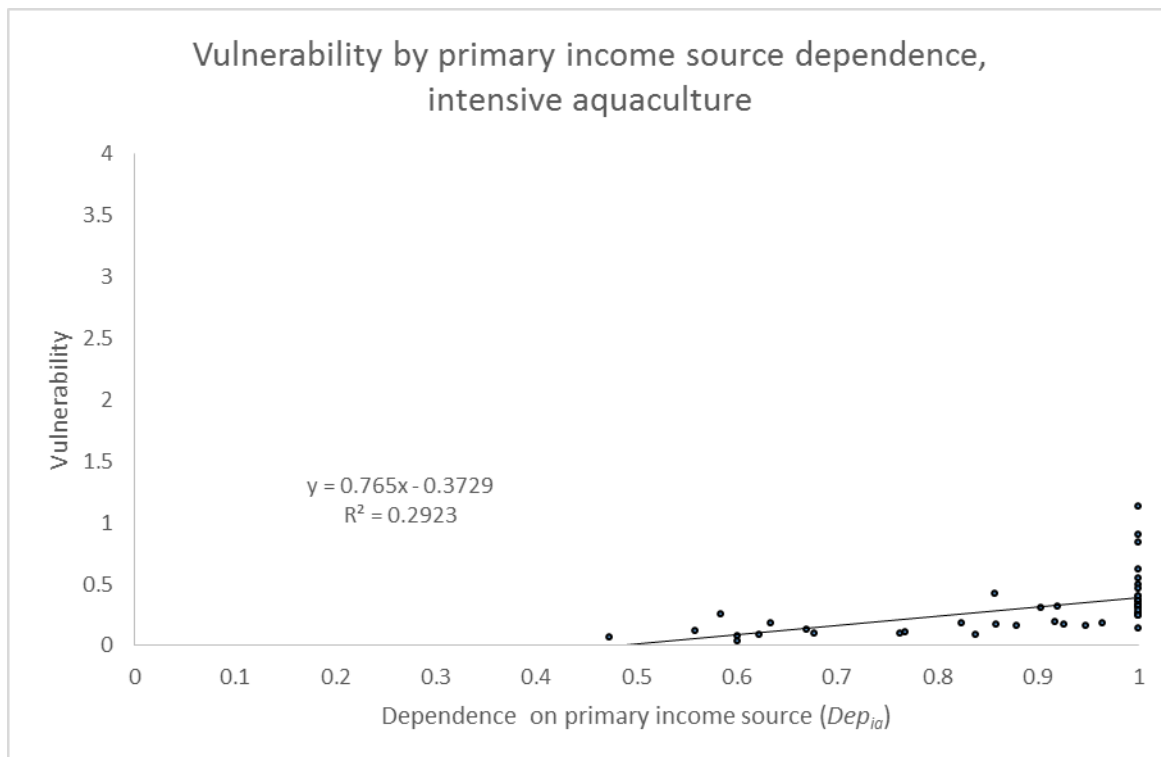


Appendix Ve

Vulnerability analysis - Simple linear regression of vulnerability by primary income source dependence by primary activity

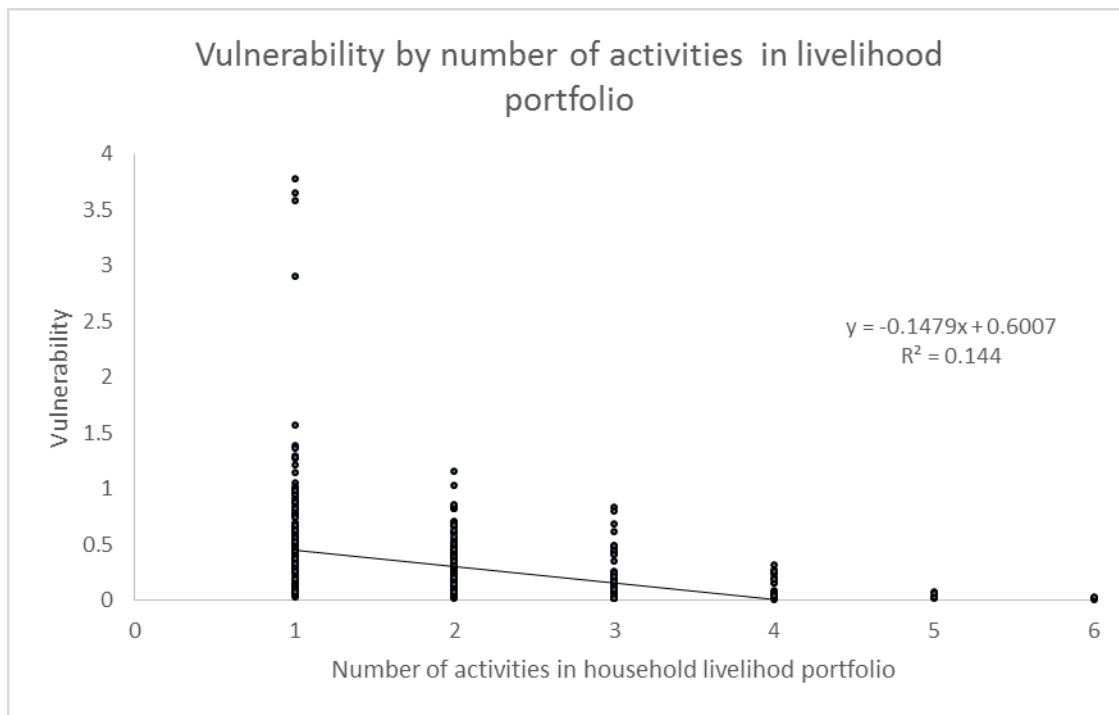


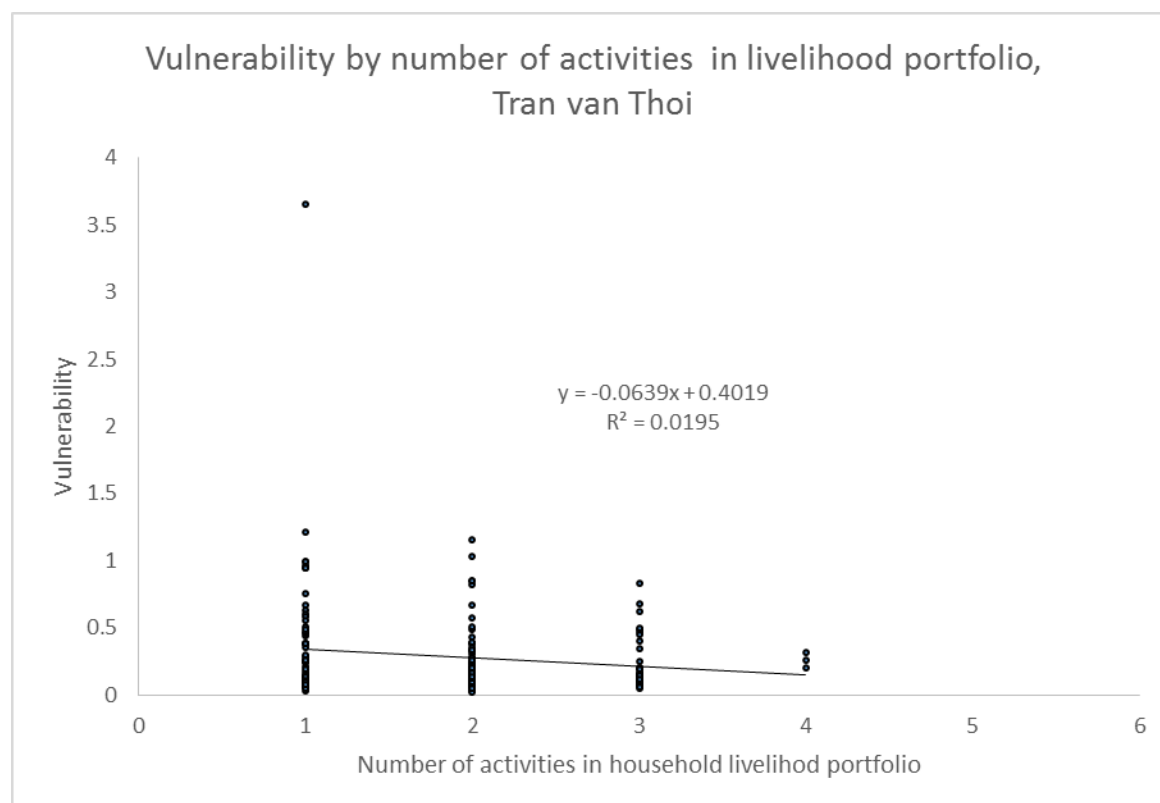
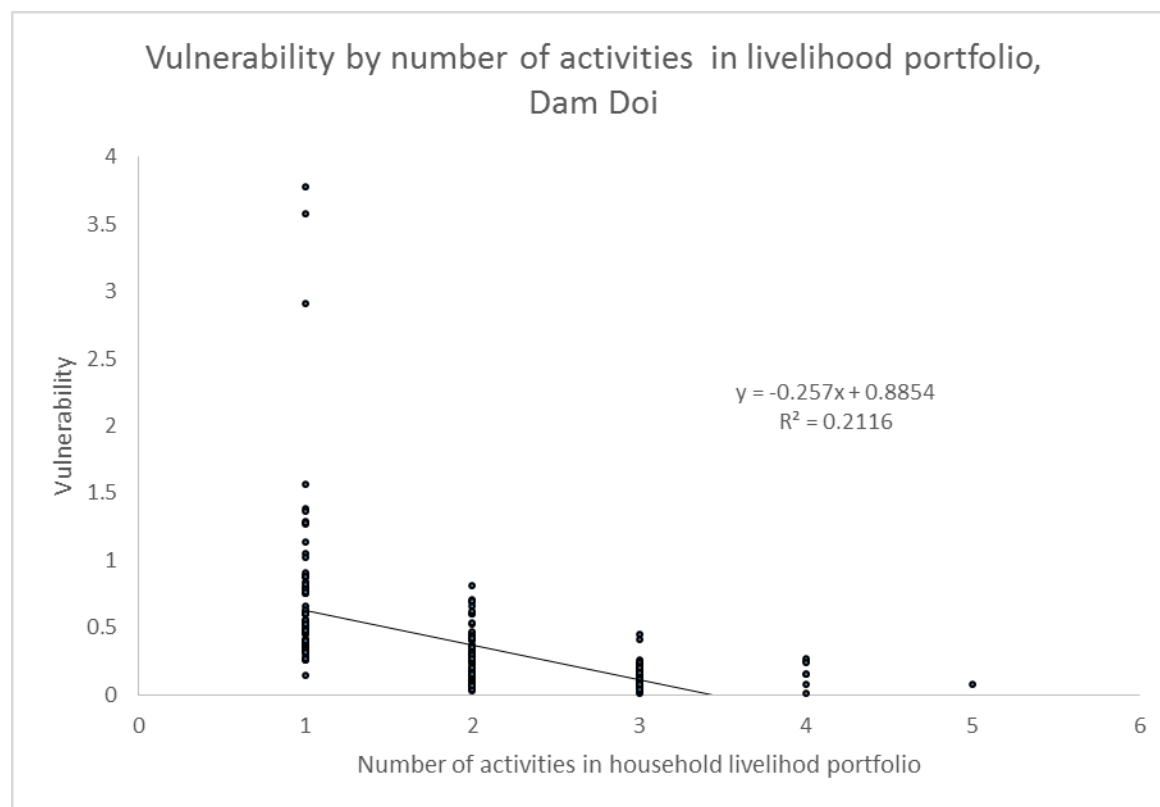


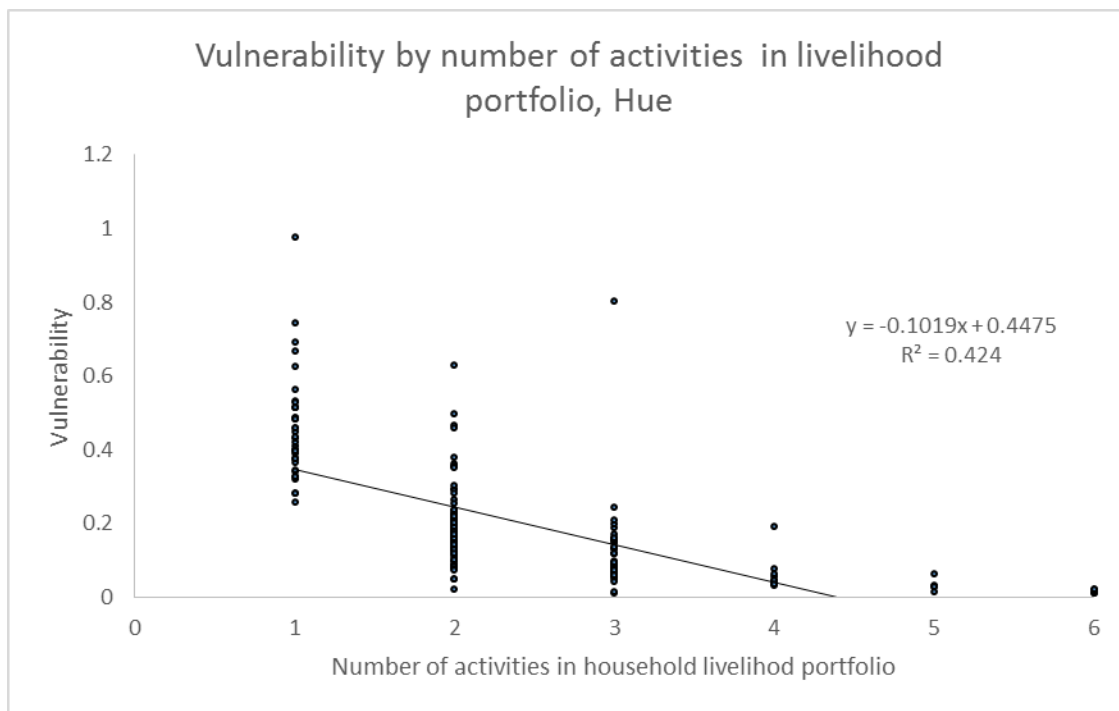


Appendix Vf

Vulnerability analysis - Simple linear regression of vulnerability by number of activities in livelihood portfolio by district

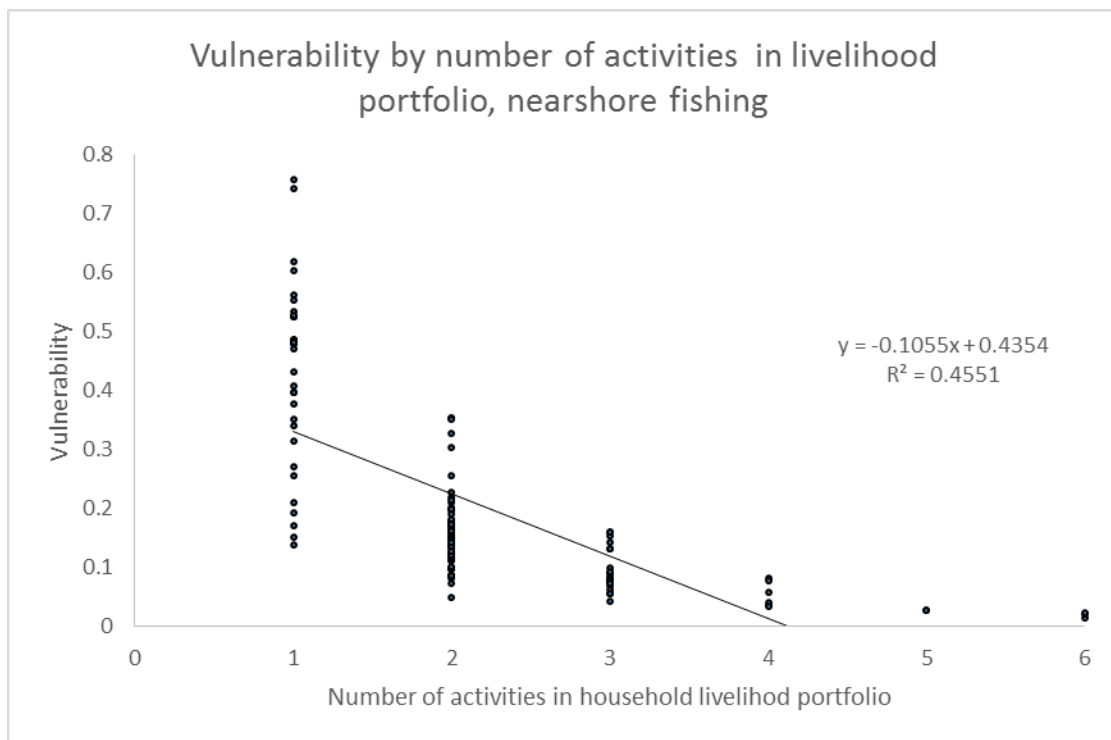


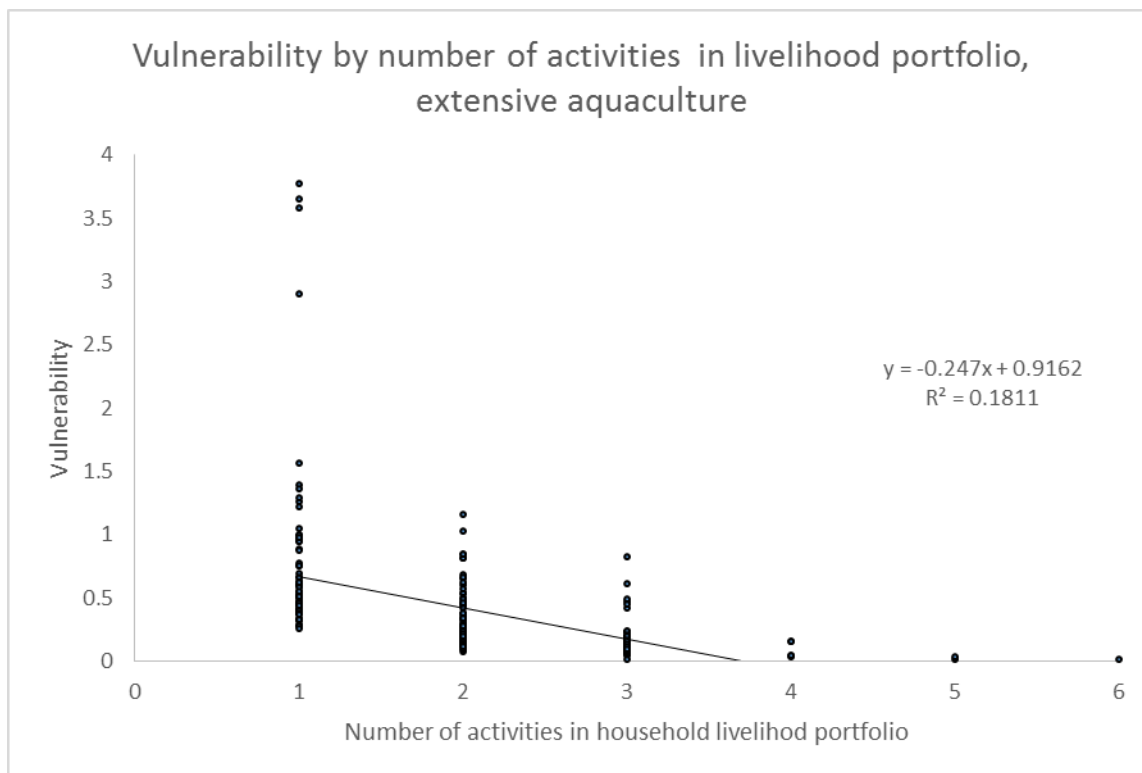
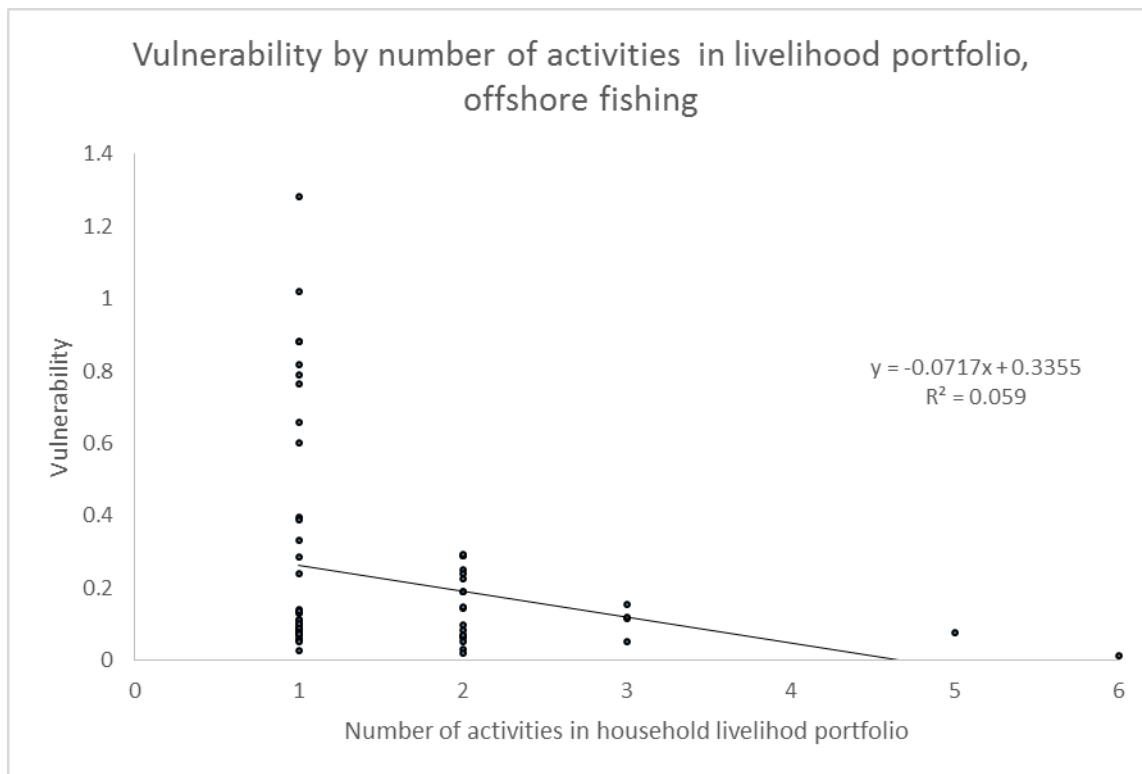


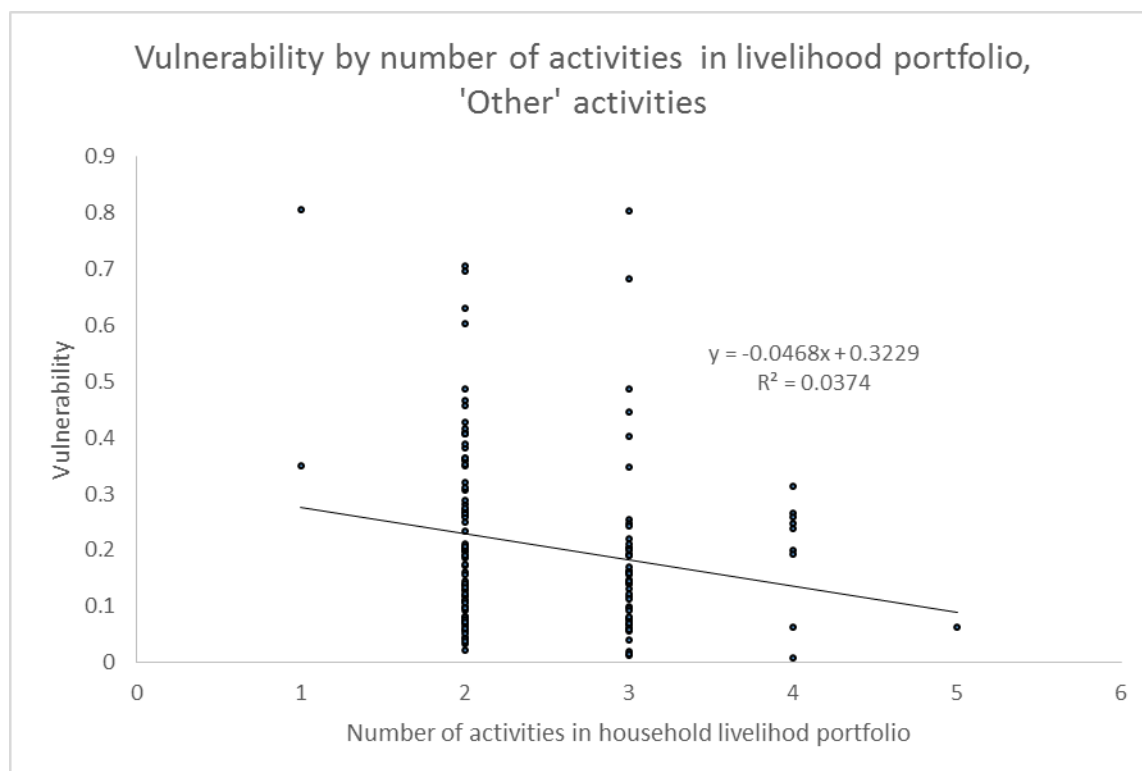
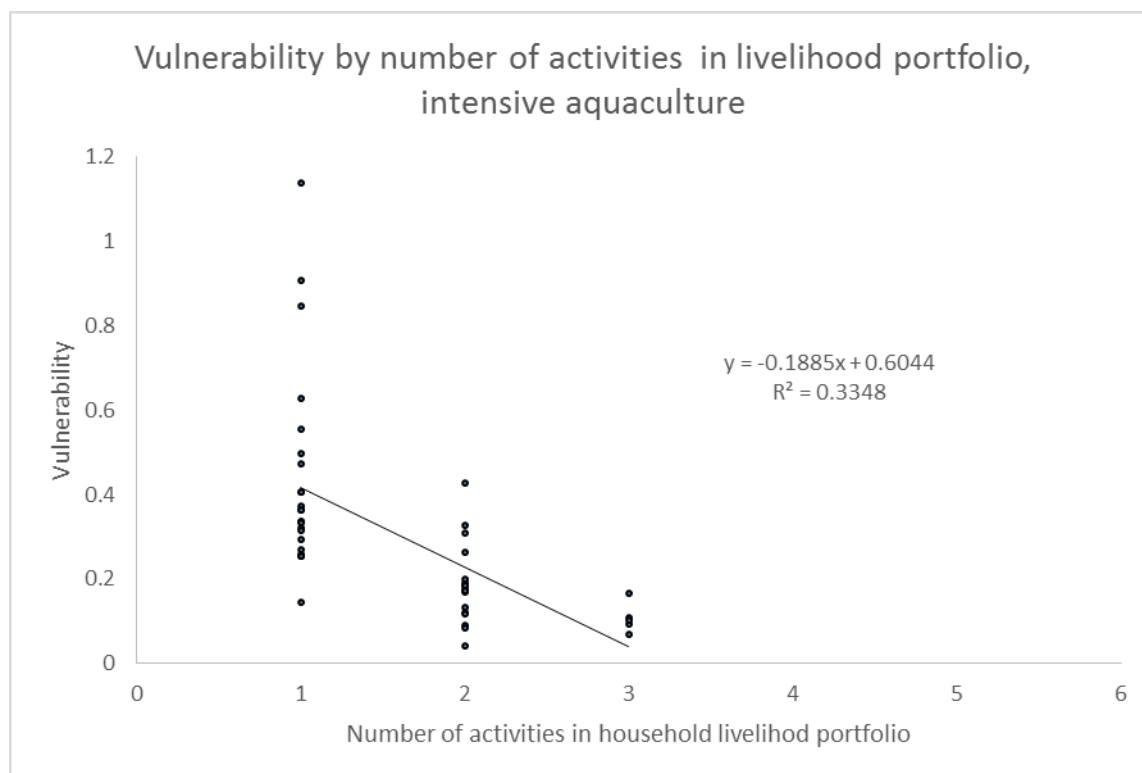


Appendix Vg

Vulnerability analysis - Simple linear regression of vulnerability by number of activities in livelihood portfolio by primary activity







Appendix VI **Poverty analysis – Poverty headcount ratio, poverty gap and vulnerability by primary activity by district for households above and below the poverty line**

Geography	Primary activity	Total number of households reporting	Average variance about poverty line for all households below, at, and above threshold	Poverty headcount ratio - percent of households below poverty line (\$653,000 VND monthly per capita)	Number of households below poverty line (\$653,000 VND monthly per capita)	Poverty gap for households below poverty line (\$653,000 VND monthly per capita)	Vulnerability for households below poverty line (\$653,000 VND monthly per capita)	Number of households at or above poverty line (\$653,000 VND monthly per capita)	Poverty gap for households at or above poverty line (\$653,000 VND monthly per capita)	Vulnerability for households at or above poverty line (\$653,000 VND monthly per capita)
All geography	All sectors	599	3.436476	23.37%	140	-0.3557047	0.5610573	459	4.675365	0.2193277
All geography	Fishing as primary activity - near-shore	127	2.084007	27.56%	35	-0.2844381	0.3468128	92	2.839463	0.1571526
All geography	Fishing as primary activity - off-shore	67	18.95549	2.99%	2	-0.2183512	1.150547	65	20.39655	0.1968306
All geography	Aquaculture as primary activity - extensive	210	0.8850175	28.10%	59	-0.3758502	0.813006	151	1.293171	0.2957321
All geography	Aquaculture as primary activity - intensive	46	3.258633	10.87%	5	-0.419772	0.7165096	41	3.504373	0.2550595
All geography	Other as primary activity	149	1.250541	26.17%	39	-0.3880154	0.322015	110	2.000347	0.1664218
Dam Doi	All sectors	220	1.603983	30.91%	68	-0.4188206	0.6724112	152	2.312304	0.2688858
Dam Doi	Fishing as primary activity - near-shore	14	-0.1440452	78.57%	11	-0.3498667	0.4847627	3	0.7114741	0.2679799
Dam Doi	Fishing as primary activity - off-shore	19	3.839604	10.53%	2	-0.2183512	1.150547	17	3.614576	0.4643207
Dam Doi	Aquaculture as primary activity - extensive	73	0.8156809	28.77%	21	-0.436954	1.041454	52	1.307699	0.3028358
Dam Doi	Aquaculture as primary activity - intensive	34	3.235645	11.76%	4	-0.496767	0.7890111	30	3.356314	0.2627057
Dam Doi	Other as primary activity	77	1.376743	35.06%	27	-0.4373511	0.3365326	50	2.383966	0.1708925
Tran van Thoi	All sectors	179	8.757549	12.85%	23	-0.400366	0.7872172	156	10.5692	0.2078076
Tran van Thoi	Fishing as primary activity - near-shore	34	6.357526	0.00%	0	.	.	34	6.357526	0.1659748
Tran van Thoi	Fishing as primary activity - off-shore	42	28.3507	0.00%	0	.	.	42	29.96163	0.0965253
Tran van Thoi	Aquaculture as primary activity - extensive	43	0.9286438	34.88%	15	-0.4119649	0.9186281	28	1.648491	0.463677
Tran van Thoi	Aquaculture as primary activity - intensive	12	3.323766	8.33%	1	-0.1117917	0.4265038	11	3.908169	0.2342062
Tran van Thoi	Other as primary activity	49	1.66959	16.33%	8	-0.4186447	0.4125627	41	2.075696	0.174672
Hue	All sectors	200	0.6898594	24.50%	49	-0.2471519	0.3003688	151	0.9650803	0.1813429
Hue	Fishing as primary activity - near-shore	77	0.5420219	28.57%	22	-0.2503015	0.2748389	55	0.7807322	0.1456537
Hue	Fishing as primary activity - off-shore	6	1.056038	0.00%	0	.	.	6	0.9899706	0.1410791
Hue	Aquaculture as primary activity - extensive	88	0.9205828	19.32%	17	-0.2498769	0.3714305	71	1.142404	0.2242976
Hue	Aquaculture as primary activity - intensive	.	.	.	.	.	.	.	.	.
Hue	Other as primary activity	30	0.4085858	36.67%	11	-0.2339557	0.2313842	19	0.8282282	0.1368539

Appendix VIIa **Vietnam Transitions Survey – Total shocks reported by primary activity by district**

Geography	Primary sector	Lack of water supply	Salinization in ground water	Disease in fish	Disease in animals/pests in crops	Diminishing stocks/crops	Major storms, climate related events	Reduced price of crop	Reduced price of catch	Food price increase	Input price increase	Serious illness or death in household	Job loss of household member	Displacement	Thief/stealing of fish or shrimp	Cannot access loan
All districts	All sectors	36	131	296	61	174	50	43	177	249	243	68	6	7	7	5
All districts	Fishing as primary activity - near-shore	23	33	26	1	79	16	11	53	56	50	13	1	4	.	.
All districts	Fishing as primary activity - off-shore	1	4	3	1	33	13	1	28	27	23	6	1	1	.	.
All districts	Aquaculture as primary activity - extensive	9	50	134	31	36	8	15	42	79	75	27	1	.	5	2
All districts	Aquaculture as primary activity - intensive	.	18	38	9	2	6	4	14	25	35	4	1	.	.	.
All districts	Other as primary activity	3	26	95	19	24	7	12	40	62	60	18	2	2	2	3
Dam Doi	All sectors	3	55	144	41	32	26	5	57	92	84	19	4	5	6	.
Dam Doi	Fishing as primary activity - near-shore	.	1	1	1	5	3	.	5	1	.	2	.	3	.	.
Dam Doi	Fishing as primary activity - off-shore	1	1	1	.	9	9	.	12	10	1	1	.	.	.	.
Dam Doi	Aquaculture as primary activity - extensive	2	19	57	19	7	5	1	17	31	30	7	1	.	4	.
Dam Doi	Aquaculture as primary activity - intensive	.	17	31	9	.	4	1	7	20	27	4	1	.	.	.
Dam Doi	Other as primary activity	.	17	54	12	11	5	3	16	30	26	5	2	2	2	.
Tran van Thoi	All sectors	1	5	70	18	75	17	37	71	102	96	21	1	2	.	.
Tran van Thoi	Fishing as primary activity - near-shore	.	.	.	.	32	10	11	18	28	17	.	.	1	.	.
Tran van Thoi	Fishing as primary activity - off-shore	.	1	1	1	23	2	1	14	15	20	4	1	1	.	.
Tran van Thoi	Aquaculture as primary activity - extensive	1	1	33	11	11	2	13	14	30	24	9	.	.	.	.
Tran van Thoi	Aquaculture as primary activity - intensive	.	1	7	.	2	2	3	7	5	8	.	.	.	.	.
Tran van Thoi	Other as primary activity	.	2	29	6	7	1	9	18	24	27	8	.	.	.	.
Hue	All sectors	32	71	82	2	67	7	1	49	55	63	28	1	.	1	5
Hue	Fishing as primary activity - near-shore	23	32	25	.	42	3	.	30	27	33	11	1	.	.	.
Hue	Fishing as primary activity - off-shore	.	2	1	.	1	2	.	2	2	2	1	.	.	.	.
Hue	Aquaculture as primary activity - extensive	6	30	44	1	18	1	1	11	18	21	11	.	.	1	2
Hue	Aquaculture as primary activity - intensive	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Hue	Other as primary activity	3	7	12	1	6	1	.	6	8	7	5	.	.	.	3

Appendix VIIb

Vietnam Transitions Survey – Top shocks and impacts reported by primary activity by district

Disease in fish	Geography	Primary activity	Total number of households reporting disease in fish as a top 3 shock	Impact on income - Households reporting	Impact on income - Households declaring increase		Impact on income - Households declaring decrease		Impact on income - Households declaring no change		Impact on assets - Households reporting	Impact on assets - Households declaring increase		Impact on assets - Households declaring decrease		Impact on assets - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	278	274	3	1.09%	269	98.18%	2	0.73%	201	1	0.50%	43	21.39%	157	78.11%
	All districts	Fishing as primary activity - near-shore	25	25	0	0.00%	25	9.12%	0	0.00%	24	0	0.00%	17	8.46%	7	3.48%
	All districts	Fishing as primary activity - off-shore	2	2	0	0.00%	2	0.73%	0	0.00%	2	0	0.00%	0	0.00%	2	1.00%
	All districts	Aquaculture as primary activity - extensive	124	122	1	0.36%	119	43.43%	2	0.73%	88	0	0.00%	18	8.96%	70	34.83%
	All districts	Aquaculture as primary activity - intensive	36	34	0	0.00%	34	12.41%	0	0.00%	28	0	0.00%	4	1.99%	24	11.94%
	All districts	Other as primary activity	91	91	2	0.73%	89	32.48%	0	0.00%	59	1	0.50%	4	1.99%	54	26.87%
	Dam Doi	All sectors	140	138	0	0.00%	138	50.36%	0	0.00%	89	0	0.00%	13	6.47%	76	37.81%
	Dam Doi	Fishing as primary activity - near-shore	1	1	0	0.00%	1	0.36%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Fishing as primary activity - off-shore	1	1	0	0.00%	1	0.36%	0	0.00%	1	0	0.00%	0	0.00%	1	0.50%
	Dam Doi	Aquaculture as primary activity - extensive	57	57	0	0.00%	57	20.80%	0	0.00%	36	0	0.00%	6	2.99%	30	14.93%
	Dam Doi	Aquaculture as primary activity - intensive	29	27	0	0.00%	27	9.85%	0	0.00%	22	0	0.00%	3	1.49%	19	9.45%
	Dam Doi	Other as primary activity	52	52	0	0.00%	52	18.98%	0	0.00%	30	0	0.00%	4	1.99%	26	12.94%
	Tran van Thoi	All sectors	68	66	3	1.09%	62	22.63%	1	0.36%	42	1	0.50%	4	1.99%	37	18.41%
	Tran van Thoi	Fishing as primary activity - near-shore	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Fishing as primary activity - off-shore	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Aquaculture as primary activity - extensive	34	32	1	0.36%	30	10.95%	1	0.36%	19	0	0.00%	3	1.49%	16	7.96%
	Tran van Thoi	Aquaculture as primary activity - intensive	7	7	0	0.00%	7	2.55%	0	0.00%	6	0	0.00%	1	0.50%	5	2.49%
	Tran van Thoi	Other as primary activity	27	27	2	0.73%	25	9.12%	0	0.00%	17	1	0.50%	0	0.00%	16	7.96%
	Hue	All sectors	70	70	0	0.00%	69	25.18%	1	0.36%	70	0	0.00%	26	12.94%	44	21.89%
	Hue	Fishing as primary activity - near-shore	24	24	0	0.00%	24	8.76%	0	0.00%	24	0	0.00%	17	8.46%	7	3.48%
	Hue	Fishing as primary activity - off-shore	1	1	0	0.00%	1	0.36%	0	0.00%	1	0	0.00%	0	0.00%	1	0.50%
	Hue	Aquaculture as primary activity - extensive	33	33	0	0.00%	32	11.68%	1	0.36%	33	0	0.00%	9	4.48%	24	11.94%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	12	12	0	0.00%	12	4.38%	0	0.00%	12	0	0.00%	0	0.00%	12	5.97%

Disease in fish	Geography	Primary activity	Total number of households reporting disease in fish as a top 3 shock	Impact on farmed fish - Households reporting	Impact on farmed fish -- Households declaring increase		Impact on farmed fish - Households declaring decrease		Impact on farmed fish - Households declaring no change		Impact on catch - Households reporting	Impact on catch -- Households declaring increase		Impact on catch - Households declaring decrease		Impact on catch - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	278	269	33	12.27%	202	75.09%	34	12.64%	51	3	5.88%	3	5.88%	45	88.24%
	All districts	Fishing as primary activity - near-shore	25	25	0	0.00%	24	8.92%	1	0.37%	24	0	0.00%	2	3.92%	22	43.14%
	All districts	Fishing as primary activity - off-shore	2	2	0	0.00%	1	0.37%	1	0.37%	2	0	0.00%	0	0.00%	2	3.92%
	All districts	Aquaculture as primary activity - extensive	124	119	15	5.58%	89	33.09%	15	5.58%	15	1	1.96%	1	1.96%	13	25.49%
	All districts	Aquaculture as primary activity - intensive	36	33	3	1.12%	28	10.41%	2	0.74%	0	0	0.00%	0	0.00%	0	0.00%
	All districts	Other as primary activity	91	90	15	5.58%	60	22.30%	15	5.58%	10	2	3.92%	0	0.00%	8	15.69%
	Dam Doi	All sectors	140	139	12	4.46%	112	41.64%	15	5.58%	11	2	3.92%	0	0.00%	9	17.65%
	Dam Doi	Fishing as primary activity - near-shore	1	1	0	0.00%	1	0.37%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Fishing as primary activity - off-shore	1	1	0	0.00%	0	0.00%	1	0.37%	1	0	0.00%	0	0.00%	1	1.96%
	Dam Doi	Aquaculture as primary activity - extensive	57	57	5	1.86%	45	16.73%	7	2.60%	5	1	1.96%	0	0.00%	4	7.84%
	Dam Doi	Aquaculture as primary activity - intensive	29	28	2	0.74%	25	9.29%	1	0.37%	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Other as primary activity	52	52	5	1.86%	41	15.24%	6	2.23%	5	1	1.96%	0	0.00%	4	7.84%
	Tran van Thoi	All sectors	68	60	20	7.43%	29	10.78%	11	4.09%	1	0	0.00%	0	0.00%	1	1.96%
	Tran van Thoi	Fishing as primary activity - near-shore	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Fishing as primary activity - off-shore	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Aquaculture as primary activity - extensive	34	29	10	3.72%	15	5.58%	4	1.49%	1	0	0.00%	0	0.00%	1	1.96%
	Tran van Thoi	Aquaculture as primary activity - intensive	7	5	1	0.37%	3	1.12%	1	0.37%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Other as primary activity	27	26	9	3.35%	11	4.09%	6	2.23%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	All sectors	70	70	1	0.37%	61	22.68%	8	2.97%	39	1	1.96%	3	5.88%	35	68.63%
	Hue	Fishing as primary activity - near-shore	24	24	0	0.00%	23	8.55%	1	0.37%	24	0	0.00%	2	3.92%	22	43.14%
	Hue	Fishing as primary activity - off-shore	1	1	0	0.00%	1	0.37%	0	0.00%	1	0	0.00%	0	0.00%	1	1.96%
	Hue	Aquaculture as primary activity - extensive	33	33	0	0.00%	29	10.78%	4	1.49%	9	0	0.00%	1	1.96%	8	15.69%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	12	12	1	0.37%	8	2.97%	3	1.12%	5	1	1.96%	0	0.00%	4	7.84%

Disease in fish	Geography	Primary activity	Total number of households reporting disease in fish as a top 3 shock	Impact on crops - Households reporting	Impact on crops -- Households declaring increase		Impact on crops - Households declaring decrease		Impact on crops - Households declaring no change		Impact on savings - Households reporting	Impact on savings -- Households declaring increase		Impact on savings - Households declaring decrease		Impact on savings - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	278	90	7	7.78%	10	11.11%	73	81.11%	157	0	0.00%	132	84.08%	25	15.92%
	All districts	Fishing as primary activity - near-shore	25	8	0	0.00%	0	0.00%	8	8.89%	24	0	0.00%	21	13.38%	3	1.91%
	All districts	Fishing as primary activity - off-shore	2	0	0	0.00%	0	0.00%	0	0.00%	2	0	0.00%	2	1.27%	0	0.00%
	All districts	Aquaculture as primary activity - extensive	124	38	3	3.33%	5	5.56%	30	33.33%	71	0	0.00%	57	36.31%	14	8.92%
	All districts	Aquaculture as primary activity - intensive	36	8	0	0.00%	1	1.11%	7	7.78%	13	0	0.00%	12	7.64%	1	0.64%
	All districts	Other as primary activity	91	36	4	4.44%	4	4.44%	28	31.11%	47	0	0.00%	40	25.48%	7	4.46%
	Dam Doi	All sectors	140	36	3	3.33%	9	10.00%	24	26.67%	65	0	0.00%	59	37.58%	6	3.82%
	Dam Doi	Fishing as primary activity - near-shore	1	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Fishing as primary activity - off-shore	1	0	0	0.00%	0	0.00%	0	0.00%	1	0	0.00%	1	0.64%	0	0.00%
	Dam Doi	Aquaculture as primary activity - extensive	57	15	2	2.22%	4	4.44%	9	10.00%	31	0	0.00%	27	17.20%	4	2.55%
	Dam Doi	Aquaculture as primary activity - intensive	29	4	0	0.00%	1	1.11%	3	3.33%	10	0	0.00%	9	5.73%	1	0.64%
	Dam Doi	Other as primary activity	52	17	1	1.11%	4	4.44%	12	13.33%	23	0	0.00%	22	14.01%	1	0.64%
	Tran van Thoi	All sectors	68	30	2	2.22%	1	1.11%	27	30.00%	22	0	0.00%	21	13.38%	1	0.64%
	Tran van Thoi	Fishing as primary activity - near-shore	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Fishing as primary activity - off-shore	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Aquaculture as primary activity - extensive	34	12	0	0.00%	1	1.11%	11	12.22%	7	0	0.00%	7	4.46%	0	0.00%
	Tran van Thoi	Aquaculture as primary activity - intensive	7	4	0	0.00%	0	0.00%	4	4.44%	3	0	0.00%	3	1.91%	0	0.00%
	Tran van Thoi	Other as primary activity	27	14	2	2.22%	0	0.00%	12	13.33%	12	0	0.00%	11	7.01%	1	0.64%
	Hue	All sectors	70	24	2	2.22%	0	0.00%	22	24.44%	70	0	0.00%	52	33.12%	18	11.46%
	Hue	Fishing as primary activity - near-shore	24	8	0	0.00%	0	0.00%	8	8.89%	24	0	0.00%	21	13.38%	3	1.91%
	Hue	Fishing as primary activity - off-shore	1	0	0	0.00%	0	0.00%	0	0.00%	1	0	0.00%	1	0.64%	0	0.00%
	Hue	Aquaculture as primary activity - extensive	33	11	1	1.11%	0	0.00%	10	11.11%	33	0	0.00%	23	14.65%	10	6.37%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	12	5	1	1.11%	0	0.00%	4	4.44%	12	0	0.00%	7	4.46%	5	3.18%

Disease in fish	Geography	Primary activity	Total number of households reporting disease in fish as a top 3 shock	Impact on food consumption - Households reporting	Impact on food consumption -- Households declaring increase		Impact on food consumption - Households declaring decrease		Impact on food consumption - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	278	166	1	0.60%	30	18.07%	135	81.33%
	All districts	Fishing as primary activity - near-shore	25	24	0	0.00%	6	3.61%	18	10.84%
	All districts	Fishing as primary activity - off-shore	2	2	0	0.00%	0	0.00%	2	1.20%
	All districts	Aquaculture as primary activity - extensive	124	75	0	0.00%	10	6.02%	65	39.16%
	All districts	Aquaculture as primary activity - intensive	36	14	1	0.60%	4	2.41%	9	5.42%
	All districts	Other as primary activity	91	51	0	0.00%	10	6.02%	41	24.70%
	Dam Doi	All sectors	140	57	0	0.00%	7	4.22%	50	30.12%
	Dam Doi	Fishing as primary activity - near-shore	1	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Fishing as primary activity - off-shore	1	1	0	0.00%	0	0.00%	1	0.60%
	Dam Doi	Aquaculture as primary activity - extensive	57	27	0	0.00%	3	1.81%	24	14.46%
	Dam Doi	Aquaculture as primary activity - intensive	29	8	0	0.00%	1	0.60%	7	4.22%
	Dam Doi	Other as primary activity	52	21	0	0.00%	3	1.81%	18	10.84%
	Tran van Thoi	All sectors	68	41	1	0.60%	12	7.23%	28	16.87%
	Tran van Thoi	Fishing as primary activity - near-shore	0	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Fishing as primary activity - off-shore	0	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Aquaculture as primary activity - extensive	34	17	0	0.00%	4	2.41%	13	7.83%
	Tran van Thoi	Aquaculture as primary activity - intensive	7	6	1	0.60%	3	1.81%	2	1.20%
	Tran van Thoi	Other as primary activity	27	18	0	0.00%	5	3.01%	13	7.83%
	Hue	All sectors	70	68	0	0.00%	11	6.63%	57	34.34%
	Hue	Fishing as primary activity - near-shore	24	24	0	0.00%	6	3.61%	18	10.84%
	Hue	Fishing as primary activity - off-shore	1	1	0	0.00%	0	0.00%	1	0.60%
	Hue	Aquaculture as primary activity - extensive	33	31	0	0.00%	3	1.81%	28	16.87%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	12	12	0	0.00%	2	1.20%	10	6.02%

Food price increase	Geography	Primary activity	Total number of households reporting food price increase as a top 3 shock	Impact on income - Households reporting	Impact on income - Households declaring increase		Impact on income - Households declaring decrease		Impact on income - Households declaring no change		Impact on assets - Households reporting	Impact on assets - Households declaring increase		Impact on assets - Households declaring decrease		Impact on assets - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	54	54	0	0.00%	54	100.00%	0	0.00%	54	0	0.00%	10	18.52%	44	81.48%
	All districts	Fishing as primary activity - near-shore	23	23	0	0.00%	23	42.59%	0	0.00%	23	0	0.00%	3	5.56%	20	37.04%
	All districts	Fishing as primary activity - off-shore	23	23	0	0.00%	23	42.59%	0	0.00%	23	0	0.00%	2	3.70%	21	38.89%
	All districts	Aquaculture as primary activity - extensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	All districts	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	All districts	Other as primary activity	8	8	0	0.00%	8	14.81%	0	0.00%	8	0	0.00%	5	9.26%	3	5.56%
	Dam Doi	All sectors	20	20	0	0.00%	20	37.04%	0	0.00%	20	0	0.00%	5	9.26%	15	27.78%
	Dam Doi	Fishing as primary activity - near-shore	6	6	0	0.00%	6	11.11%	0	0.00%	6	0	0.00%	1	1.85%	5	9.26%
	Dam Doi	Fishing as primary activity - off-shore	10	10	0	0.00%	10	18.52%	0	0.00%	10	0	0.00%	2	3.70%	8	14.81%
	Dam Doi	Aquaculture as primary activity - extensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Other as primary activity	4	4	0	0.00%	4	7.41%	0	0.00%	4	0	0.00%	2	3.70%	2	3.70%
	Tran van Thoi	All sectors	24	24	0	0.00%	24	44.44%	0	0.00%	24	0	0.00%	0	0.00%	24	44.44%
	Tran van Thoi	Fishing as primary activity - near-shore	11	11	0	0.00%	11	20.37%	0	0.00%	11	0	0.00%	0	0.00%	11	20.37%
	Tran van Thoi	Fishing as primary activity - off-shore	12	12	0	0.00%	12	22.22%	0	0.00%	12	0	0.00%	0	0.00%	12	22.22%
	Tran van Thoi	Aquaculture as primary activity - extensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Other as primary activity	1	1	0	0.00%	1	1.85%	0	0.00%	1	0	0.00%	0	0.00%	1	1.85%
	Hue	All sectors	10	10	0	0.00%	10	18.52%	0	0.00%	10	0	0.00%	5	9.26%	5	9.26%
	Hue	Fishing as primary activity - near-shore	6	6	0	0.00%	6	11.11%	0	0.00%	6	0	0.00%	2	3.70%	4	7.41%
	Hue	Fishing as primary activity - off-shore	1	1	0	0.00%	1	1.85%	0	0.00%	1	0	0.00%	0	0.00%	1	1.85%
	Hue	Aquaculture as primary activity - extensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	3	3	0	0.00%	3	5.56%	0	0.00%	3	0	0.00%	3	5.56%	0	0.00%

Food price increase	Geography	Primary activity	Total number of households reporting food price increase as a top 3 shock	Impact on farmed fish - Households reporting	Impact on farmed fish -- Households declaring increase		Impact on farmed fish - Households declaring decrease		Impact on farmed fish - Households declaring no change		Impact on catch - Households reporting	Impact on catch -- Households declaring increase		Impact on catch - Households declaring decrease		Impact on catch - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	54	4	0	0.00%	0	0.00%	4	100.00%	53	18	33.96%	13	24.53%	22	41.51%
	All districts	Fishing as primary activity - near-shore	23	2	0	0.00%	0	0.00%	2	50.00%	22	8	15.09%	4	7.55%	10	18.87%
	All districts	Fishing as primary activity - off-shore	23	1	0	0.00%	0	0.00%	1	25.00%	23	9	16.98%	3	5.66%	11	20.75%
	All districts	Aquaculture as primary activity - extensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	All districts	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	All districts	Other as primary activity	8	1	0	0.00%	0	0.00%	1	25.00%	8	1	1.89%	6	11.32%	1	1.89%
	Dam Doi	All sectors	20	1	0	0.00%	0	0.00%	1	25.00%	20	14	26.42%	6	11.32%	0	0.00%
	Dam Doi	Fishing as primary activity - near-shore	6	0	0	0.00%	0	0.00%	0	0.00%	6	5	9.43%	1	1.89%	0	0.00%
	Dam Doi	Fishing as primary activity - off-shore	10	0	0	0.00%	0	0.00%	0	0.00%	10	8	15.09%	2	3.77%	0	0.00%
	Dam Doi	Aquaculture as primary activity - extensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Other as primary activity	4	1	0	0.00%	0	0.00%	1	25.00%	4	1	1.89%	3	5.66%	0	0.00%
	Tran van Thoi	All sectors	24	1	0	0.00%	0	0.00%	1	25.00%	24	1	1.89%	2	3.77%	21	39.62%
	Tran van Thoi	Fishing as primary activity - near-shore	11	0	0	0.00%	0	0.00%	0	0.00%	11	0	0.00%	2	3.77%	9	16.98%
	Tran van Thoi	Fishing as primary activity - off-shore	12	1	0	0.00%	0	0.00%	1	25.00%	12	1	1.89%	0	0.00%	11	20.75%
	Tran van Thoi	Aquaculture as primary activity - extensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Other as primary activity	1	0	0	0.00%	0	0.00%	0	0.00%	1	0	0.00%	0	0.00%	1	1.89%
	Hue	All sectors	10	2	0	0.00%	0	0.00%	2	50.00%	9	3	5.66%	5	9.43%	1	1.89%
	Hue	Fishing as primary activity - near-shore	6	2	0	0.00%	0	0.00%	2	50.00%	5	3	5.66%	1	1.89%	1	1.89%
	Hue	Fishing as primary activity - off-shore	1	0	0	0.00%	0	0.00%	0	0.00%	1	0	0.00%	1	1.89%	0	0.00%
	Hue	Aquaculture as primary activity - extensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	3	0	0	0.00%	0	0.00%	0	0.00%	3	0	0.00%	3	5.66%	0	0.00%

Food price increase	Geography	Primary activity	Total number of households reporting food price increase as a top 3 shock	Impact on crops - Households reporting	Impact on crops -- Households declaring increase		Impact on crops - Households declaring decrease		Impact on crops - Households declaring no change		Impact on savings - Households reporting	Impact on savings -- Households declaring increase		Impact on savings - Households declaring decrease		Impact on savings - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	54	12	0	0.00%	0	0.00%	12	100.00%	51	0	0.00%	43	84.31%	8	15.69%
	All districts	Fishing as primary activity - near-shore	23	6	0	0.00%	0	0.00%	6	50.00%	22	0	0.00%	18	35.29%	4	7.84%
	All districts	Fishing as primary activity - off-shore	23	2	0	0.00%	0	0.00%	2	16.67%	21	0	0.00%	17	33.33%	4	7.84%
	All districts	Aquaculture as primary activity - extensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	All districts	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	All districts	Other as primary activity	8	4	0	0.00%	0	0.00%	4	33.33%	8	0	0.00%	8	15.69%	0	0.00%
	Dam Doi	All sectors	20	2	0	0.00%	0	0.00%	2	16.67%	18	0	0.00%	12	23.53%	6	11.76%
	Dam Doi	Fishing as primary activity - near-shore	6	0	0	0.00%	0	0.00%	0	0.00%	5	0	0.00%	2	3.92%	3	5.88%
	Dam Doi	Fishing as primary activity - off-shore	10	1	0	0.00%	0	0.00%	1	8.33%	9	0	0.00%	6	11.76%	3	5.88%
	Dam Doi	Aquaculture as primary activity - extensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Other as primary activity	4	1	0	0.00%	0	0.00%	1	8.33%	4	0	0.00%	4	7.84%	0	0.00%
	Tran van Thoi	All sectors	24	7	0	0.00%	0	0.00%	7	58.33%	23	0	0.00%	22	43.14%	1	1.96%
	Tran van Thoi	Fishing as primary activity - near-shore	11	5	0	0.00%	0	0.00%	5	41.67%	11	0	0.00%	11	21.57%	0	0.00%
	Tran van Thoi	Fishing as primary activity - off-shore	12	1	0	0.00%	0	0.00%	1	8.33%	11	0	0.00%	10	19.61%	1	1.96%
	Tran van Thoi	Aquaculture as primary activity - extensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Other as primary activity	1	1	0	0.00%	0	0.00%	1	8.33%	1	0	0.00%	1	1.96%	0	0.00%
	Hue	All sectors	10	3	0	0.00%	0	0.00%	3	25.00%	10	0	0.00%	9	17.65%	1	1.96%
	Hue	Fishing as primary activity - near-shore	6	1	0	0.00%	0	0.00%	1	8.33%	6	0	0.00%	5	9.80%	1	1.96%
	Hue	Fishing as primary activity - off-shore	1	0	0	0.00%	0	0.00%	0	0.00%	1	0	0.00%	1	1.96%	0	0.00%
	Hue	Aquaculture as primary activity - extensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	3	2	0	0.00%	0	0.00%	2	16.67%	3	0	0.00%	3	5.88%	0	0.00%

Food price increase	Geography	Primary activity	Total number of households reporting food price increase as a top 3 shock	Impact on food consumption - Households reporting	Impact on food consumption -- Households declaring increase		Impact on food consumption - Households declaring decrease		Impact on food consumption - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	54	52	0	0.00%	23	44.23%	29	55.77%
	All districts	Fishing as primary activity - near-shore	23	23	0	0.00%	13	25.00%	10	19.23%
	All districts	Fishing as primary activity - off-shore	23	21	0	0.00%	4	7.69%	17	32.69%
	All districts	Aquaculture as primary activity - extensive	0	0	0	0.00%	0	0.00%	0	0.00%
	All districts	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%
	All districts	Other as primary activity	8	8	0	0.00%	6	11.54%	2	3.85%
	Dam Doi	All sectors	20	19	0	0.00%	6	11.54%	13	25.00%
	Dam Doi	Fishing as primary activity - near-shore	6	6	0	0.00%	1	1.92%	5	9.62%
	Dam Doi	Fishing as primary activity - off-shore	10	9	0	0.00%	2	3.85%	7	13.46%
	Dam Doi	Aquaculture as primary activity - extensive	0	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Other as primary activity	4	4	0	0.00%	3	5.77%	1	1.92%
	Tran van Thoi	All sectors	24	23	0	0.00%	14	26.92%	9	17.31%
	Tran van Thoi	Fishing as primary activity - near-shore	11	11	0	0.00%	11	21.15%	0	0.00%
	Tran van Thoi	Fishing as primary activity - off-shore	12	11	0	0.00%	2	3.85%	9	17.31%
	Tran van Thoi	Aquaculture as primary activity - extensive	0	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Other as primary activity	1	1	0	0.00%	1	1.92%	0	0.00%
	Hue	All sectors	10	10	0	0.00%	3	5.77%	7	13.46%
	Hue	Fishing as primary activity - near-shore	6	6	0	0.00%	1	1.92%	5	9.62%
	Hue	Fishing as primary activity - off-shore	1	1	0	0.00%	0	0.00%	1	1.92%
	Hue	Aquaculture as primary activity - extensive	0	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	3	3	0	0.00%	2	3.85%	1	1.92%

Input price increase	Geography	Primary activity	Total number of households reporting input price increase as a top 3 shock	Impact on income - Households reporting	Impact on income - Households declaring increase		Impact on income - Households declaring decrease		Impact on income - Households declaring no change		Impact on assets - Households reporting	Impact on assets - Households declaring increase		Impact on assets - Households declaring decrease		Impact on assets - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	184	173	0	0.00%	149	86.13%	24	13.87%	134	0	0.00%	14	10.45%	120	89.55%
	All districts	Fishing as primary activity - near-shore	38	37	0	0.00%	32	18.50%	5	2.89%	37	0	0.00%	2	1.49%	35	26.12%
	All districts	Fishing as primary activity - off-shore	22	22	0	0.00%	13	7.51%	9	5.20%	21	0	0.00%	2	1.49%	19	14.18%
	All districts	Aquaculture as primary activity - extensive	58	54	0	0.00%	51	29.48%	3	1.73%	34	0	0.00%	3	2.24%	31	23.13%
	All districts	Aquaculture as primary activity - intensive	18	16	0	0.00%	16	9.25%	0	0.00%	11	0	0.00%	2	1.49%	9	6.72%
	All districts	Other as primary activity	48	44	0	0.00%	37	21.39%	7	4.05%	31	0	0.00%	5	3.73%	26	19.40%
	Dam Doi	All sectors	74	68	0	0.00%	67	38.73%	1	0.58%	53	0	0.00%	9	6.72%	44	32.84%
	Dam Doi	Fishing as primary activity - near-shore	1	1	0	0.00%	1	0.58%	0	0.00%	1	0	0.00%	0	0.00%	1	0.75%
	Dam Doi	Fishing as primary activity - off-shore	9	9	0	0.00%	9	5.20%	0	0.00%	9	0	0.00%	2	1.49%	7	5.22%
	Dam Doi	Aquaculture as primary activity - extensive	25	24	0	0.00%	23	13.29%	1	0.58%	17	0	0.00%	1	0.75%	16	11.94%
	Dam Doi	Aquaculture as primary activity - intensive	14	4	0	0.00%	4	2.31%	0	0.00%	9	0	0.00%	2	1.49%	7	5.22%
	Dam Doi	Other as primary activity	25	14	0	0.00%	14	8.09%	0	0.00%	17	0	0.00%	4	2.99%	13	9.70%
	Tran van Thoi	All sectors	88	83	0	0.00%	68	39.31%	15	8.67%	59	0	0.00%	3	2.24%	56	41.79%
	Tran van Thoi	Fishing as primary activity - near-shore	26	25	0	0.00%	24	13.87%	1	0.58%	25	0	0.00%	0	0.00%	25	18.66%
	Tran van Thoi	Fishing as primary activity - off-shore	12	12	0	0.00%	3	1.73%	9	5.20%	11	0	0.00%	0	0.00%	11	8.21%
	Tran van Thoi	Aquaculture as primary activity - extensive	28	25	0	0.00%	23	13.29%	2	1.16%	12	0	0.00%	2	1.49%	10	7.46%
	Tran van Thoi	Aquaculture as primary activity - intensive	4	4	0	0.00%	4	2.31%	0	0.00%	2	0	0.00%	0	0.00%	2	1.49%
	Tran van Thoi	Other as primary activity	18	17	0	0.00%	14	8.09%	3	1.73%	9	0	0.00%	1	0.75%	8	5.97%
	Hue	All sectors	22	22	0	0.00%	14	8.09%	8	4.62%	22	0	0.00%	2	1.49%	20	14.93%
	Hue	Fishing as primary activity - near-shore	11	11	0	0.00%	7	4.05%	4	2.31%	11	0	0.00%	2	1.49%	9	6.72%
	Hue	Fishing as primary activity - off-shore	1	1	0	0.00%	1	0.58%	0	0.00%	1	0	0.00%	0	0.00%	1	0.75%
	Hue	Aquaculture as primary activity - extensive	5	5	0	0.00%	5	2.89%	0	0.00%	5	0	0.00%	0	0.00%	5	3.73%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	5	5	0	0.00%	1	0.58%	4	2.31%	5	0	0.00%	0	0.00%	5	3.73%

Input price increase	Geography	Primary activity	Total number of households reporting input price increase as a top 3 shock	Impact on farmed fish - Households reporting	Impact on farmed fish -- Households declaring increase		Impact on farmed fish - Households declaring decrease		Impact on farmed fish - Households declaring no change		Impact on catch - Households reporting	Impact on catch -- Households declaring increase		Impact on catch - Households declaring decrease		Impact on catch - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	184	96	27	28.13%	32	33.33%	37	38.54%	77	7	9.09%	11	14.29%	59	76.62%
	All districts	Fishing as primary activity - near-shore	38	3	0	0.00%	1	1.04%	2	2.08%	35	1	1.30%	3	3.90%	31	40.26%
	All districts	Fishing as primary activity - off-shore	22	2	1	1.04%	0	0.00%	1	1.04%	22	6	7.79%	1	1.30%	15	19.48%
	All districts	Aquaculture as primary activity - extensive	58	47	14	14.58%	12	12.50%	21	21.88%	4	0	0.00%	1	1.30%	3	3.90%
	All districts	Aquaculture as primary activity - intensive	18	12	1	1.04%	7	7.29%	4	4.17%	1	0	0.00%	0	0.00%	1	1.30%
	All districts	Other as primary activity	48	32	11	11.46%	12	12.50%	9	9.38%	15	0	0.00%	6	7.79%	9	11.69%
	Dam Doi	All sectors	74	47	8	8.33%	19	19.79%	20	20.83%	18	4	5.19%	5	6.49%	9	11.69%
	Dam Doi	Fishing as primary activity - near-shore	1	1	0	0.00%	0	0.00%	1	1.04%	1	0	0.00%	0	0.00%	1	1.30%
	Dam Doi	Fishing as primary activity - off-shore	9	2	1	1.04%	0	0.00%	1	1.04%	9	4	5.19%	1	1.30%	4	5.19%
	Dam Doi	Aquaculture as primary activity - extensive	25	18	2	2.08%	5	5.21%	11	11.46%	1	0	0.00%	0	0.00%	1	1.30%
	Dam Doi	Aquaculture as primary activity - intensive	14	9	0	0.00%	6	6.25%	3	3.13%	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Other as primary activity	25	17	5	5.21%	8	8.33%	4	4.17%	7	0	0.00%	4	5.19%	3	3.90%
	Tran van Thoi	All sectors	88	40	19	19.79%	12	12.50%	9	9.38%	40	3	3.90%	4	5.19%	33	42.86%
	Tran van Thoi	Fishing as primary activity - near-shore	26	0	0	0.00%	0	0.00%	0	0.00%	23	1	1.30%	2	2.60%	20	25.97%
	Tran van Thoi	Fishing as primary activity - off-shore	12	0	0	0.00%	0	0.00%	0	0.00%	12	2	2.60%	0	0.00%	10	12.99%
	Tran van Thoi	Aquaculture as primary activity - extensive	28	24	12	12.50%	7	7.29%	5	5.21%	1	0	0.00%	1	1.30%	0	0.00%
	Tran van Thoi	Aquaculture as primary activity - intensive	4	3	1	1.04%	1	1.04%	1	1.04%	1	0	0.00%	0	0.00%	1	1.30%
	Tran van Thoi	Other as primary activity	18	13	6	6.25%	4	4.17%	3	3.13%	3	0	0.00%	1	1.30%	2	2.60%
	Hue	All sectors	22	9	0	0.00%	1	1.04%	8	8.33%	19	0	0.00%	2	2.60%	17	22.08%
	Hue	Fishing as primary activity - near-shore	11	2	0	0.00%	1	1.04%	1	1.04%	11	0	0.00%	1	1.30%	10	12.99%
	Hue	Fishing as primary activity - off-shore	1	0	0	0.00%	0	0.00%	0	0.00%	1	0	0.00%	0	0.00%	1	1.30%
	Hue	Aquaculture as primary activity - extensive	5	5	0	0.00%	0	0.00%	5	5.21%	2	0	0.00%	0	0.00%	2	2.60%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	5	2	0	0.00%	0	0.00%	2	2.08%	5	0	0.00%	1	1.30%	4	5.19%

Input price increase	Geography	Primary activity	Total number of households reporting input price increase as a top 3 shock	Impact on crops - Households reporting	Impact on crops -- Households declaring increase		Impact on crops - Households declaring decrease		Impact on crops - Households declaring no change		Impact on savings - Households reporting	Impact on savings -- Households declaring increase		Impact on savings - Households declaring decrease		Impact on savings - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	184	67	4	5.97%	15	22.39%	48	71.64%	126	0	0.00%	112	88.89%	14	11.11%
	All districts	Fishing as primary activity - near-shore	38	22	0	0.00%	6	8.96%	16	23.88%	38	0	0.00%	38	30.16%	0	0.00%
	All districts	Fishing as primary activity - off-shore	22	5	1	1.49%	0	0.00%	4	5.97%	21	0	0.00%	14	11.11%	7	5.56%
	All districts	Aquaculture as primary activity - extensive	58	17	2	2.99%	2	2.99%	13	19.40%	25	0	0.00%	23	18.25%	2	1.59%
	All districts	Aquaculture as primary activity - intensive	18	2	0	0.00%	0	0.00%	2	2.99%	12	0	0.00%	10	7.94%	2	1.59%
	All districts	Other as primary activity	48	21	1	1.49%	7	10.45%	13	19.40%	30	0	0.00%	27	21.43%	3	2.38%
	Dam Doi	All sectors	74	23	2	2.99%	4	5.97%	17	25.37%	56	0	0.00%	50	39.68%	6	4.76%
	Dam Doi	Fishing as primary activity - near-shore	1	1	0	0.00%	0	0.00%	1	1.49%	1	0	0.00%	1	0.79%	0	0.00%
	Dam Doi	Fishing as primary activity - off-shore	9	2	0	0.00%	0	0.00%	2	2.99%	9	0	0.00%	7	5.56%	2	1.59%
	Dam Doi	Aquaculture as primary activity - extensive	25	9	1	1.49%	2	2.99%	6	8.96%	18	0	0.00%	16	12.70%	2	1.59%
	Dam Doi	Aquaculture as primary activity - intensive	14	1	0	0.00%	0	0.00%	1	1.49%	10	0	0.00%	9	7.14%	1	0.79%
	Dam Doi	Other as primary activity	25	10	1	1.49%	2	2.99%	7	10.45%	18	0	0.00%	17	13.49%	1	0.79%
	Tran van Thoi	All sectors	88	38	2	2.99%	9	13.43%	27	40.30%	48	0	0.00%	40	31.75%	8	6.35%
	Tran van Thoi	Fishing as primary activity - near-shore	26	18	0	0.00%	5	7.46%	13	19.40%	26	0	0.00%	26	20.63%	0	0.00%
	Tran van Thoi	Fishing as primary activity - off-shore	12	3	1	1.49%	0	0.00%	2	2.99%	11	0	0.00%	6	4.76%	5	3.97%
	Tran van Thoi	Aquaculture as primary activity - extensive	28	7	1	1.49%	0	0.00%	6	8.96%	2	0	0.00%	2	1.59%	0	0.00%
	Tran van Thoi	Aquaculture as primary activity - intensive	4	1	0	0.00%	0	0.00%	1	1.49%	2	0	0.00%	1	0.79%	1	0.79%
	Tran van Thoi	Other as primary activity	18	9	0	0.00%	4	5.97%	5	7.46%	7	0	0.00%	5	3.97%	2	1.59%
	Hue	All sectors	22	6	0	0.00%	2	2.99%	4	5.97%	22	0	0.00%	22	17.46%	0	0.00%
	Hue	Fishing as primary activity - near-shore	11	3	0	0.00%	1	1.49%	2	2.99%	11	0	0.00%	11	8.73%	0	0.00%
	Hue	Fishing as primary activity - off-shore	1	0	0	0.00%	0	0.00%	0	0.00%	1	0	0.00%	1	0.79%	0	0.00%
	Hue	Aquaculture as primary activity - extensive	5	1	0	0.00%	0	0.00%	1	1.49%	5	0	0.00%	5	3.97%	0	0.00%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	5	2	0	0.00%	1	1.49%	1	1.49%	5	0	0.00%	5	3.97%	0	0.00%

Input price increase	Geography	Primary activity	Total number of households reporting input price increase as a top 3 shock	Impact on food consumption - Households reporting	Impact on food consumption -- Households declaring increase		Impact on food consumption - Households declaring decrease		Impact on food consumption - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	184	133	0	0.00%	86	64.66%	47	35.34%
	All districts	Fishing as primary activity - near-shore	38	38	0	0.00%	35	26.32%	3	2.26%
	All districts	Fishing as primary activity - off-shore	22	20	0	0.00%	15	11.28%	5	3.76%
	All districts	Aquaculture as primary activity - extensive	58	36	0	0.00%	16	12.03%	20	15.04%
	All districts	Aquaculture as primary activity - intensive	18	8	0	0.00%	4	3.01%	4	3.01%
	All districts	Other as primary activity	48	31	0	0.00%	16	12.03%	15	11.28%
	Dam Doi	All sectors	74	48	0	0.00%	20	15.04%	28	21.05%
	Dam Doi	Fishing as primary activity - near-shore	1	1	0	0.00%	0	0.00%	1	0.75%
	Dam Doi	Fishing as primary activity - off-shore	9	9	0	0.00%	4	3.01%	5	3.76%
	Dam Doi	Aquaculture as primary activity - extensive	25	17	0	0.00%	6	4.51%	11	8.27%
	Dam Doi	Aquaculture as primary activity - intensive	14	5	0	0.00%	3	2.26%	2	1.50%
	Dam Doi	Other as primary activity	25	16	0	0.00%	7	5.26%	9	6.77%
	Tran van Thoi	All sectors	88	63	0	0.00%	47	35.34%	16	12.03%
	Tran van Thoi	Fishing as primary activity - near-shore	26	26	0	0.00%	25	18.80%	1	0.75%
	Tran van Thoi	Fishing as primary activity - off-shore	12	11	0	0.00%	11	8.27%	0	0.00%
	Tran van Thoi	Aquaculture as primary activity - extensive	28	13	0	0.00%	5	3.76%	8	6.02%
	Tran van Thoi	Aquaculture as primary activity - intensive	4	3	0	0.00%	1	0.75%	2	1.50%
	Tran van Thoi	Other as primary activity	18	10	0	0.00%	5	3.76%	5	3.76%
	Hue	All sectors	22	22	0	0.00%	19	14.29%	3	2.26%
	Hue	Fishing as primary activity - near-shore	11	11	0	0.00%	10	7.52%	1	0.75%
	Hue	Fishing as primary activity - off-shore	1	1	0	0.00%	1	0.75%	0	0.00%
	Hue	Aquaculture as primary activity - extensive	5	5	0	0.00%	4	3.01%	1	0.75%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	5	5	0	0.00%	4	3.01%	1	0.60%

Diminishing stock/crops	Geography	Primary activity	Total number of households reporting decrease in stock/crop as a top 3 shock	Impact on income - Households reporting	Impact on income - Households declaring increase		Impact on income - Households declaring decrease		Impact on income - Households declaring no change		Impact on assets - Households reporting	Impact on assets - Households declaring increase		Impact on assets - Households declaring decrease		Impact on assets - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	127	126	0	0.00%	125	99.21%	1	0.79%	119	0	0.00%	34	28.57%	85	71.43%
	All districts	Fishing as primary activity - near-shore	71	71	0	0.00%	71	56.35%	0	0.00%	69	0	0.00%	24	20.17%	45	37.82%
	All districts	Fishing as primary activity - off-shore	32	32	0	0.00%	31	24.60%	1	0.79%	31	0	0.00%	3	2.52%	28	23.53%
	All districts	Aquaculture as primary activity - extensive	10	9	0	0.00%	9	7.14%	0	0.00%	8	0	0.00%	0	0.00%	8	6.72%
	All districts	Aquaculture as primary activity - intensive	1	1	0	0.00%	1	0.79%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	All districts	Other as primary activity	13	13	0	0.00%	13	10.32%	0	0.00%	11	0	0.00%	7	5.88%	4	3.36%
	Dam Doi	All sectors	21	20	0	0.00%	20	15.87%	0	0.00%	16	0	0.00%	6	5.04%	10	8.40%
	Dam Doi	Fishing as primary activity - near-shore	5	5	0	0.00%	5	3.97%	0	0.00%	3	0	0.00%	2	1.68%	1	0.84%
	Dam Doi	Fishing as primary activity - off-shore	9	9	0	0.00%	9	7.14%	0	0.00%	9	0	0.00%	1	0.84%	8	6.72%
	Dam Doi	Aquaculture as primary activity - extensive	2	1	0	0.00%	1	0.79%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Other as primary activity	5	5	0	0.00%	5	3.97%	0	0.00%	4	0	0.00%	3	2.52%	1	0.84%
	Tran van Thoi	All sectors	58	58	0	0.00%	57	45.24%	1	0.79%	55	0	0.00%	2	1.68%	53	44.54%
	Tran van Thoi	Fishing as primary activity - near-shore	29	29	0	0.00%	29	23.02%	0	0.00%	29	0	0.00%	0	0.00%	29	24.37%
	Tran van Thoi	Fishing as primary activity - off-shore	22	22	0	0.00%	21	16.67%	1	0.79%	21	0	0.00%	2	1.68%	19	15.97%
	Tran van Thoi	Aquaculture as primary activity - extensive	2	2	0	0.00%	2	1.59%	0	0.00%	2	0	0.00%	0	0.00%	2	1.68%
	Tran van Thoi	Aquaculture as primary activity - intensive	1	1	0	0.00%	1	0.79%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Other as primary activity	4	4	0	0.00%	4	3.17%	0	0.00%	3	0	0.00%	0	0.00%	3	2.52%
	Hue	All sectors	48	48	0	0.00%	48	38.10%	0	0.00%	48	0	0.00%	26	21.85%	22	18.49%
	Hue	Fishing as primary activity - near-shore	37	37	0	0.00%	37	29.37%	0	0.00%	37	0	0.00%	22	18.49%	15	12.61%
	Hue	Fishing as primary activity - off-shore	1	1	0	0.00%	1	0.79%	0	0.00%	1	0	0.00%	0	0.00%	1	0.84%
	Hue	Aquaculture as primary activity - extensive	6	6	0	0.00%	6	4.76%	0	0.00%	6	0	0.00%	0	0.00%	6	5.04%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	4	4	0	0.00%	4	3.17%	0	0.00%	4	0	0.00%	4	3.36%	0	0.00%

Diminishing stock/crops	Geography	Primary activity	Total number of households reporting decrease in stock/crop as a top 3 shock	Impact on farmed fish - Households reporting	Impact on farmed fish -- Households declaring increase		Impact on farmed fish - Households declaring decrease		Impact on farmed fish - Households declaring no change		Impact on catch - Households reporting	Impact on catch -- Households declaring increase		Impact on catch - Households declaring decrease		Impact on catch - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	127	35	3	8.57%	7	20.00%	25	71.43%	116	18	15.52%	51	43.97%	47	40.52%
	All districts	Fishing as primary activity - near-shore	71	20	1	2.86%	0	0.00%	19	54.29%	69	5	4.31%	36	31.03%	28	24.14%
	All districts	Fishing as primary activity - off-shore	32	0	0	0.00%	0	0.00%	0	0.00%	31	10	8.62%	5	4.31%	16	13.79%
	All districts	Aquaculture as primary activity - extensive	10	9	1	2.86%	5	14.29%	3	8.57%	6	1	0.86%	4	3.45%	1	0.86%
	All districts	Aquaculture as primary activity - intensive	1	1	0	0.00%	1	2.86%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	All districts	Other as primary activity	13	5	1	2.86%	1	2.86%	3	8.57%	10	2	1.72%	6	5.17%	2	1.72%
	Dam Doi	All sectors	21	3	0	0.00%	1	2.86%	2	5.71%	17	13	11.21%	4	3.45%	0	0.00%
	Dam Doi	Fishing as primary activity - near-shore	5	0	0	0.00%	0	0.00%	0	0.00%	3	2	1.72%	1	0.86%	0	0.00%
	Dam Doi	Fishing as primary activity - off-shore	9	0	0	0.00%	0	0.00%	0	0.00%	9	8	6.90%	1	0.86%	0	0.00%
	Dam Doi	Aquaculture as primary activity - extensive	2	1	0	0.00%	1	2.86%	0	0.00%	1	1	0.86%	0	0.00%	0	0.00%
	Dam Doi	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Other as primary activity	5	2	0	0.00%	0	0.00%	2	5.71%	4	2	1.72%	2	1.72%	0	0.00%
	Tran van Thoi	All sectors	58	4	2	5.71%	2	5.71%	0	0.00%	53	4	3.45%	7	6.03%	42	36.21%
	Tran van Thoi	Fishing as primary activity - near-shore	29	0	0	0.00%	0	0.00%	0	0.00%	29	2	1.72%	3	2.59%	24	20.69%
	Tran van Thoi	Fishing as primary activity - off-shore	22	0	0	0.00%	0	0.00%	0	0.00%	21	2	1.72%	3	2.59%	16	13.79%
	Tran van Thoi	Aquaculture as primary activity - extensive	2	2	1	2.86%	1	2.86%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Aquaculture as primary activity - intensive	1	1	0	0.00%	1	2.86%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Other as primary activity	4	1	1	2.86%	0	0.00%	0	0.00%	3	0	0.00%	1	0.86%	2	1.72%
	Hue	All sectors	48	28	1	2.86%	4	11.43%	23	65.71%	46	1	0.86%	40	34.48%	5	4.31%
	Hue	Fishing as primary activity - near-shore	37	20	1	2.86%	0	0.00%	19	54.29%	37	1	0.86%	32	27.59%	4	3.45%
	Hue	Fishing as primary activity - off-shore	1	0	0	0.00%	0	0.00%	0	0.00%	1	0	0.00%	1	0.86%	0	0.00%
	Hue	Aquaculture as primary activity - extensive	6	6	0	0.00%	3	8.57%	3	8.57%	5	0	0.00%	4	3.45%	1	0.86%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	4	2	0	0.00%	1	2.86%	1	2.86%	3	0	0.00%	3	2.59%	0	0.00%

Diminishing stock/crops	Geography	Primary activity	Total number of households reporting decrease in stock/crop as a top 3 shock	Impact on crops - Households reporting	Impact on crops -- Households declaring increase		Impact on crops - Households declaring decrease		Impact on crops - Households declaring no change		Impact on savings - Households reporting	Impact on savings -- Households declaring increase		Impact on savings - Households declaring decrease		Impact on savings - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	127	36	1	2.78%	0	0.00%	35	97.22%	116	0	0.00%	108	93.10%	8	6.90%
	All districts	Fishing as primary activity - near-shore	71	26	0	0.00%	0	0.00%	26	72.22%	70	0	0.00%	65	56.03%	5	4.31%
	All districts	Fishing as primary activity - off-shore	32	5	0	0.00%	0	0.00%	5	13.89%	29	0	0.00%	26	22.41%	3	2.59%
	All districts	Aquaculture as primary activity - extensive	10	1	0	0.00%	0	0.00%	1	2.78%	7	0	0.00%	7	6.03%	0	0.00%
	All districts	Aquaculture as primary activity - intensive	1	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	All districts	Other as primary activity	13	4	1	2.78%	0	0.00%	3	8.33%	10	0	0.00%	10	8.62%	0	0.00%
	Dam Doi	All sectors	21	3	0	0.00%	0	0.00%	3	8.33%	15	0	0.00%	15	12.93%	0	0.00%
	Dam Doi	Fishing as primary activity - near-shore	5	0	0	0.00%	0	0.00%	0	0.00%	4	0	0.00%	4	3.45%	0	0.00%
	Dam Doi	Fishing as primary activity - off-shore	9	2	0	0.00%	0	0.00%	2	5.56%	7	0	0.00%	7	6.03%	0	0.00%
	Dam Doi	Aquaculture as primary activity - extensive	2	0	0	0.00%	0	0.00%	0	0.00%	1	0	0.00%	1	0.86%	0	0.00%
	Dam Doi	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Other as primary activity	5	1	0	0.00%	0	0.00%	1	2.78%	3	0	0.00%	3	2.59%	0	0.00%
	Tran van Thoi	All sectors	58	23	1	2.78%	0	0.00%	22	61.11%	53	0	0.00%	50	43.10%	3	2.59%
	Tran van Thoi	Fishing as primary activity - near-shore	29	18	0	0.00%	0	0.00%	18	50.00%	29	0	0.00%	29	25.00%	0	0.00%
	Tran van Thoi	Fishing as primary activity - off-shore	22	3	0	0.00%	0	0.00%	3	8.33%	21	0	0.00%	18	15.52%	3	2.59%
	Tran van Thoi	Aquaculture as primary activity - extensive	2	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Aquaculture as primary activity - intensive	1	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Other as primary activity	4	2	1	2.78%	0	0.00%	1	2.78%	3	0	0.00%	3	2.59%	0	0.00%
	Hue	All sectors	48	10	0	0.00%	0	0.00%	10	27.78%	48	0	0.00%	43	37.07%	5	4.31%
	Hue	Fishing as primary activity - near-shore	37	8	0	0.00%	0	0.00%	8	22.22%	37	0	0.00%	32	27.59%	5	4.31%
	Hue	Fishing as primary activity - off-shore	1	0	0	0.00%	0	0.00%	0	0.00%	1	0	0.00%	1	0.86%	0	0.00%
	Hue	Aquaculture as primary activity - extensive	6	1	0	0.00%	0	0.00%	1	2.78%	6	0	0.00%	6	5.17%	0	0.00%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	4	1	0	0.00%	0	0.00%	1	2.78%	4	0	0.00%	4	3.45%	0	0.00%

Diminishing stock/crops	Geography	Primary activity	Total number of households reporting decrease in stock/crop as a top 3 shock	Impact on food consumption - Households reporting	Impact on food consumption -- Households declaring increase		Impact on food consumption - Households declaring decrease		Impact on food consumption - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	127	119	0	0.00%	50	42.02%	69	57.98%
	All districts	Fishing as primary activity - near-shore	71	69	0	0.00%	38	31.93%	31	26.05%
	All districts	Fishing as primary activity - off-shore	32	30	0	0.00%	5	4.20%	25	21.01%
	All districts	Aquaculture as primary activity - extensive	10	8	0	0.00%	1	0.84%	7	5.88%
	All districts	Aquaculture as primary activity - intensive	1	1	0	0.00%	0	0.00%	1	0.84%
	All districts	Other as primary activity	13	11	0	0.00%	6	5.04%	5	4.20%
	Dam Doi	All sectors	21	16	0	0.00%	6	5.04%	10	8.40%
	Dam Doi	Fishing as primary activity - near-shore	5	3	0	0.00%	0	0.00%	3	2.52%
	Dam Doi	Fishing as primary activity - off-shore	9	8	0	0.00%	1	0.84%	7	5.88%
	Dam Doi	Aquaculture as primary activity - extensive	2	1	0	0.00%	1	0.84%	0	0.00%
	Dam Doi	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Other as primary activity	5	4	0	0.00%	4	3.36%	0	0.00%
	Tran van Thoi	All sectors	58	55	0	0.00%	34	28.57%	21	17.65%
	Tran van Thoi	Fishing as primary activity - near-shore	29	29	0	0.00%	29	24.37%	0	0.00%
	Tran van Thoi	Fishing as primary activity - off-shore	22	21	0	0.00%	3	2.52%	18	15.13%
	Tran van Thoi	Aquaculture as primary activity - extensive	2	3	0	0.00%	0	0.00%	3	2.52%
	Tran van Thoi	Aquaculture as primary activity - intensive	1	1	0	0.00%	0	0.00%	1	0.84%
	Tran van Thoi	Other as primary activity	4	3	0	0.00%	2	1.68%	1	0.84%
	Hue	All sectors	48	48	0	0.00%	10	8.40%	38	31.93%
	Hue	Fishing as primary activity - near-shore	37	37	0	0.00%	9	7.56%	28	23.53%
	Hue	Fishing as primary activity - off-shore	1	1	0	0.00%	1	0.84%	0	0.00%
	Hue	Aquaculture as primary activity - extensive	6	6	0	0.00%	0	0.00%	6	5.04%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	4	4	0	0.00%	0	0.00%	4	3.36%

Salinization	Geography	Primary activity	Total number of households reporting salinization as a top 3 shock	Impact on income - Households reporting	Impact on income - Households declaring increase		Impact on income - Households declaring decrease		Impact on income - Households declaring no change		Impact on assets - Households reporting	Impact on assets - Households declaring increase		Impact on assets - Households declaring decrease		Impact on assets - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	67	58	0	0.00%	54	93.10%	4	6.90%	52	0	0.00%	3	5.77%	49	94.23%
	All districts	Fishing as primary activity - near-shore	5	5	0	0.00%	5	8.62%	0	0.00%	5	0	0.00%	0	0.00%	5	9.62%
	All districts	Fishing as primary activity - off-shore	2	2	0	0.00%	2	3.45%	0	0.00%	2	0	0.00%	1	1.92%	1	1.92%
	All districts	Aquaculture as primary activity - extensive	33	27	0	0.00%	27	46.55%	0	0.00%	25	0	0.00%	0	0.00%	25	48.08%
	All districts	Aquaculture as primary activity - intensive	7	6	0	0.00%	5	8.62%	1	1.72%	5	0	0.00%	0	0.00%	5	9.62%
	All districts	Other as primary activity	20	18	0	0.00%	15	25.86%	3	5.17%	15	0	0.00%	2	3.85%	13	25.00%
	Dam Doi	All sectors	34	29	0	0.00%	27	46.55%	2	3.45%	23	0	0.00%	1	1.92%	22	42.31%
	Dam Doi	Fishing as primary activity - near-shore	1	1	0	0.00%	1	1.72%	0	0.00%	1	0	0.00%	0	0.00%	1	1.92%
	Dam Doi	Fishing as primary activity - off-shore	1	1	0	0.00%	1	1.72%	0	0.00%	1	0	0.00%	1	1.92%	0	0.00%
	Dam Doi	Aquaculture as primary activity - extensive	13	10	0	0.00%	10	17.24%	0	0.00%	8	0	0.00%	0	0.00%	8	15.38%
	Dam Doi	Aquaculture as primary activity - intensive	7	6	0	0.00%	5	8.62%	1	1.72%	5	0	0.00%	0	0.00%	5	9.62%
	Dam Doi	Other as primary activity	12	11	0	0.00%	10	17.24%	1	1.72%	8	0	0.00%	0	0.00%	8	15.38%
	Tran van Thoi	All sectors	8	4	0	0.00%	3	5.17%	1	1.72%	4	0	0.00%	1	1.92%	3	5.77%
	Tran van Thoi	Fishing as primary activity - near-shore	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Fishing as primary activity - off-shore	1	1	0	0.00%	1	1.72%	0	0.00%	1	0	0.00%	0	0.00%	1	1.92%
	Tran van Thoi	Aquaculture as primary activity - extensive	3	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Other as primary activity	4	3	0	0.00%	2	3.45%	1	1.72%	3	0	0.00%	1	1.92%	2	3.85%
	Hue	All sectors	25	25	0	0.00%	24	41.38%	1	1.72%	25	0	0.00%	1	1.92%	24	46.15%
	Hue	Fishing as primary activity - near-shore	4	4	0	0.00%	4	6.90%	0	0.00%	4	0	0.00%	0	0.00%	4	7.69%
	Hue	Fishing as primary activity - off-shore	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Aquaculture as primary activity - extensive	17	17	0	0.00%	17	29.31%	0	0.00%	17	0	0.00%	0	0.00%	17	32.69%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	4	4	0	0.00%	3	5.17%	1	1.72%	4	0	0.00%	1	1.92%	3	5.77%

Salinization	Geography	Primary activity	Total number of households reporting salinization as a top 3 shock	Impact on farmed fish - Households reporting	Impact on farmed fish -- Households declaring increase		Impact on farmed fish - Households declaring decrease		Impact on farmed fish - Households declaring no change		Impact on catch - Households reporting	Impact on catch -- Households declaring increase		Impact on catch - Households declaring decrease		Impact on catch - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	67	60	0	0.00%	51	85.00%	9	15.00%	19	0	0.00%	7	36.84%	12	63.16%
	All districts	Fishing as primary activity - near-shore	5	4	0	0.00%	3	5.00%	1	1.67%	5	0	0.00%	2	10.53%	3	15.79%
	All districts	Fishing as primary activity - off-shore	2	2	0	0.00%	1	1.67%	1	1.67%	2	0	0.00%	0	0.00%	2	10.53%
	All districts	Aquaculture as primary activity - extensive	33	30	0	0.00%	27	45.00%	3	5.00%	6	0	0.00%	2	10.53%	4	21.05%
	All districts	Aquaculture as primary activity - intensive	7	7	0	0.00%	7	11.67%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	All districts	Other as primary activity	20	18	1	1.67%	13	21.67%	4	6.67%	6	0	0.00%	3	15.79%	3	15.79%
	Dam Doi	All sectors	34	33	1	1.67%	28	46.67%	4	6.67%	5	0	0.00%	0	0.00%	5	26.32%
	Dam Doi	Fishing as primary activity - near-shore	1	1	0	0.00%	1	1.67%	0	0.00%	1	0	0.00%	0	0.00%	1	5.26%
	Dam Doi	Fishing as primary activity - off-shore	1	1	0	0.00%	1	1.67%	0	0.00%	1	0	0.00%	0	0.00%	1	5.26%
	Dam Doi	Aquaculture as primary activity - extensive	13	13	0	0.00%	11	18.33%	2	3.33%	1	0	0.00%	0	0.00%	1	5.26%
	Dam Doi	Aquaculture as primary activity - intensive	7	7	0	0.00%	7	11.67%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Other as primary activity	12	11	1	1.67%	8	13.33%	2	3.33%	2	0	0.00%	0	0.00%	2	10.53%
	Tran van Thoi	All sectors	8	4	0	0.00%	2	3.33%	2	3.33%	2	0	0.00%	1	5.26%	1	5.26%
	Tran van Thoi	Fishing as primary activity - near-shore	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Fishing as primary activity - off-shore	1	1	0	0.00%	0	0.00%	1	1.67%	1	0	0.00%	0	0.00%	1	5.26%
	Tran van Thoi	Aquaculture as primary activity - extensive	3	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Other as primary activity	4	3	0	0.00%	2	3.33%	1	1.67%	1	0	0.00%	1	5.26%	0	0.00%
	Hue	All sectors	25	24	0	0.00%	21	35.00%	3	5.00%	12	0	0.00%	6	31.58%	6	31.58%
	Hue	Fishing as primary activity - near-shore	4	3	0	0.00%	2	3.33%	1	1.67%	4	0	0.00%	2	10.53%	2	10.53%
	Hue	Fishing as primary activity - off-shore	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Aquaculture as primary activity - extensive	17	17	0	0.00%	16	26.67%	1	1.67%	5	0	0.00%	2	10.53%	3	15.79%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	4	4	0	0.00%	3	5.00%	1	1.67%	3	0	0.00%	2	10.53%	1	5.26%

Salinization	Geography	Primary activity	Total number of households reporting salinization as a top 3 shock	Impact on crops - Households reporting	Impact on crops -- Households declaring increase		Impact on crops - Households declaring decrease		Impact on crops - Households declaring no change		Impact on savings - Households reporting	Impact on savings -- Households declaring increase		Impact on savings - Households declaring decrease		Impact on savings - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	67	17	1	5.88%	5	29.41%	11	64.71%	45	0	0.00%	27	60.00%	18	40.00%
	All districts	Fishing as primary activity - near-shore	5	1	0	0.00%	0	0.00%	1	5.88%	5	0	0.00%	3	6.67%	2	4.44%
	All districts	Fishing as primary activity - off-shore	2	0	0	0.00%	0	0.00%	0	0.00%	2	0	0.00%	2	4.44%	0	0.00%
	All districts	Aquaculture as primary activity - extensive	33	6	1	5.88%	2	11.76%	3	17.65%	23	0	0.00%	11	24.44%	12	26.67%
	All districts	Aquaculture as primary activity - intensive	7	0	0	0.00%	0	0.00%	0	0.00%	3	0	0.00%	1	2.22%	2	4.44%
	All districts	Other as primary activity	20	10	0	0.00%	3	17.65%	7	41.18%	12	0	0.00%	10	22.22%	2	4.44%
	Dam Doi	All sectors	34	11	1	5.88%	3	17.65%	7	41.18%	16	0	0.00%	12	26.67%	4	8.89%
	Dam Doi	Fishing as primary activity - near-shore	1	1	0	0.00%	0	0.00%	1	5.88%	1	0	0.00%	1	2.22%	0	0.00%
	Dam Doi	Fishing as primary activity - off-shore	1	0	0	0.00%	0	0.00%	0	0.00%	1	0	0.00%	1	2.22%	0	0.00%
	Dam Doi	Aquaculture as primary activity - extensive	13	5	1	5.88%	2	11.76%	2	11.76%	6	0	0.00%	5	11.11%	1	2.22%
	Dam Doi	Aquaculture as primary activity - intensive	7	0	0	0.00%	0	0.00%	0	0.00%	3	0	0.00%	1	2.22%	2	4.44%
	Dam Doi	Other as primary activity	12	5	0	0.00%	1	5.88%	4	23.53%	5	0	0.00%	4	8.89%	1	2.22%
	Tran van Thoi	All sectors	8	3	0	0.00%	0	0.00%	3	17.65%	4	0	0.00%	3	6.67%	1	2.22%
	Tran van Thoi	Fishing as primary activity - near-shore	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Fishing as primary activity - off-shore	1	0	0	0.00%	0	0.00%	0	0.00%	1	0	0.00%	1	2.22%	0	0.00%
	Tran van Thoi	Aquaculture as primary activity - extensive	3	1	0	0.00%	0	0.00%	1	5.88%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Other as primary activity	4	3	0	0.00%	1	5.88%	2	11.76%	3	0	0.00%	2	4.44%	1	2.22%
	Hue	All sectors	25	2	0	0.00%	1	5.88%	1	5.88%	25	0	0.00%	12	26.67%	13	28.89%
	Hue	Fishing as primary activity - near-shore	4	0	0	0.00%	0	0.00%	0	0.00%	4	0	0.00%	2	4.44%	2	4.44%
	Hue	Fishing as primary activity - off-shore	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Aquaculture as primary activity - extensive	17	0	0	0.00%	0	0.00%	0	0.00%	17	0	0.00%	6	13.33%	11	24.44%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	4	2	0	0.00%	1	5.88%	1	5.88%	4	0	0.00%	4	8.89%	0	0.00%

Salinization	Geography	Primary activity	Total number of households reporting salinization as a top 3 shock	Impact on food consumption - Households reporting	Impact on food consumption -- Households declaring increase		Impact on food consumption - Households declaring decrease		Impact on food consumption - Households declaring no change	
				Count	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact	Count	% of total number of households reporting this impact
	All districts	All sectors	67	39	1	2.56%	1	2.56%	37	94.87%
	All districts	Fishing as primary activity - near-shore	5	5	0	0.00%	0	0.00%	5	12.82%
	All districts	Fishing as primary activity - off-shore	2	2	0	0.00%	0	0.00%	2	5.13%
	All districts	Aquaculture as primary activity - extensive	33	22	0	0.00%	0	0.00%	22	56.41%
	All districts	Aquaculture as primary activity - intensive	7	0	0	0.00%	0	0.00%	0	0.00%
	All districts	Other as primary activity	20	10	1	2.56%	1	2.56%	8	20.51%
	Dam Doi	All sectors	34	12	1	2.56%	0	0.00%	11	28.21%
	Dam Doi	Fishing as primary activity - near-shore	1	1	0	0.00%	0	0.00%	1	2.56%
	Dam Doi	Fishing as primary activity - off-shore	1	1	0	0.00%	0	0.00%	1	2.56%
	Dam Doi	Aquaculture as primary activity - extensive	13	5	0	0.00%	0	0.00%	5	12.82%
	Dam Doi	Aquaculture as primary activity - intensive	7	0	0	0.00%	0	0.00%	0	0.00%
	Dam Doi	Other as primary activity	12	5	1	2.56%	0	0.00%	4	10.26%
	Tran van Thoi	All sectors	8	3	0	0.00%	1	2.56%	2	5.13%
	Tran van Thoi	Fishing as primary activity - near-shore	0	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Fishing as primary activity - off-shore	1	1	0	0.00%	0	0.00%	1	2.56%
	Tran van Thoi	Aquaculture as primary activity - extensive	3	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%
	Tran van Thoi	Other as primary activity	4	2	0	0.00%	1	2.56%	1	2.56%
	Hue	All sectors	25	24	0	0.00%	0	0.00%	24	61.54%
	Hue	Fishing as primary activity - near-shore	4	4	0	0.00%	0	0.00%	4	10.26%
	Hue	Fishing as primary activity - off-shore	0	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Aquaculture as primary activity - extensive	17	17	0	0.00%	0	0.00%	17	43.59%
	Hue	Aquaculture as primary activity - intensive	0	0	0	0.00%	0	0.00%	0	0.00%
	Hue	Other as primary activity	4	3	0	0.00%	0	0.00%	3	7.69%

Appendix VIIc

Vietnam Transitions Survey – Coping techniques for top shocks reported by primary activity by district

Geography	Primary activity	Top shocks	Increased fishing effort - Count	Increased fish farming effort - Count	Increased farming effort - Count	Used wild rather than bought seed - Count	Reduced cost of feed for fish - Count	Reduced cost of fertilizers - Count	Received help from relatives/friends - Count	Received help from the government - Count	Relied on own savings - Count	Borrowed money - Count	Ate less - Count	Took on extra labour - Count	Had household members previously not working start - Count	Reduced health/education expenditures - Count	Sold ponds - Count	Migrated - Count	Did not do anything - Count	Reduced aquaculture/fishing scale, capacity, density - Count	Change aquaculture techniques - Count	Buy water - Count	
All districts	All primary activities	Top shocks - All shocks	49	102	1	43	55	43	202	84	111	126	69	1			1			14	115	1	8
All districts	All primary activities	Top shocks - Lack of water supply																					
All districts	All primary activities	Top shocks - Salinization in ground water	1	11		2	2	2	26		7	1	5	1						1	14	1	
All districts	All primary activities	Top shocks - Disease in fish	10	69	1	8	14	8	73	7	25	1	28				1				19		7
All districts	All primary activities	Top shocks - Disease in animals/pests in crops		1							3												
All districts	All primary activities	Top shocks - Diminishing stocks/crops	25				1	2	20	19	7	11	2						10	26			
All districts	All primary activities	Top shocks - Major storms, climate related events	1				1	6	14	8	3												
All districts	All primary activities	Top shocks - Reduced price of crop																					
All districts	All primary activities	Top shocks - Reduced price of catch		1			5																
All districts	All primary activities	Top shocks - food price increase	11						6		4		6						3				
All districts	All primary activities	Top shocks - Input price increase		9			4		21	18	6	88	17								23		
All districts	All primary activities	Top shocks - Serious illness or death in household	1	3		33	28	6	30	14	28	25	10								16		
All districts	All primary activities	Top shocks - Job loss of household member						16	3	12	17										2		
All districts	All primary activities	Top shocks - Displacement		8					9	4	7										13		1
All districts	All primary activities	Top shocks - Thief/stealing of fish or shrimp						3			2												
All districts	All primary activities	Top shocks - Cannot access loan							2	1				1									
All districts	Fishing as primary activity - near-shore	Top shocks - Lack of water supply																			2		
All districts	Fishing as primary activity - near-shore	Top shocks - Salinization in ground water							1												1		
All districts	Fishing as primary activity - near-shore	Top shocks - Disease in fish	2	3		2															2		
All districts	Fishing as primary activity - near-shore	Top shocks - Disease in animals/pests in crops																					
All districts	Fishing as primary activity - near-shore	Top shocks - Diminishing stocks/crops	7						15	15	5	8	1							7	18		
All districts	Fishing as primary activity - near-shore	Top shocks - Major storms, climate related events						1	5														
All districts	Fishing as primary activity - near-shore	Top shocks - Reduced price of crop																					
All districts	Fishing as primary activity - near-shore	Top shocks - Reduced price of catch																					
All districts	Fishing as primary activity - near-shore	Top shocks - food price increase	6						4		3		3										
All districts	Fishing as primary activity - near-shore	Top shocks - Input price increase							5	6		31											
All districts	Fishing as primary activity - near-shore	Top shocks - Serious illness or death in household					9				3	14	5								3		
All districts	Fishing as primary activity - near-shore	Top shocks - Job loss of household member							4		1	5											
All districts	Fishing as primary activity - near-shore	Top shocks - Displacement							1														
All districts	Fishing as primary activity - near-shore	Top shocks - Thief/stealing of fish or shrimp							1														
All districts	Fishing as primary activity - near-shore	Top shocks - Cannot access loan																					
All districts	Fishing as primary activity - off-shore	Top shocks - Lack of water supply																					
All districts	Fishing as primary activity - off-shore	Top shocks - Salinization in ground water																					
All districts	Fishing as primary activity - off-shore	Top shocks - Disease in fish																			1		
All districts	Fishing as primary activity - off-shore	Top shocks - Disease in animals/pests in crops																					
All districts	Fishing as primary activity - off-shore	Top shocks - Diminishing stocks/crops	13						1	3		3									4		
All districts	Fishing as primary activity - off-shore	Top shocks - Major storms, climate related events	1				2	4	3	2													
All districts	Fishing as primary activity - off-shore	Top shocks - Reduced price of crop																					
All districts	Fishing as primary activity - off-shore	Top shocks - Reduced price of catch																					
All districts	Fishing as primary activity - off-shore	Top shocks - food price increase	5						2														
All districts	Fishing as primary activity - off-shore	Top shocks - Input price increase							4		1										2		
All districts	Fishing as primary activity - off-shore	Top shocks - Serious illness or death in household	1						1		2	7									3		
All districts	Fishing as primary activity - off-shore	Top shocks - Job loss of household member							1		2												
All districts	Fishing as primary activity - off-shore	Top shocks - Displacement																					
All districts	Fishing as primary activity - off-shore	Top shocks - Thief/stealing of fish or shrimp																					
All districts	Fishing as primary activity - off-shore	Top shocks - Cannot access loan									1												
All districts	Aquaculture as primary activity - extensive	Top shocks - Lack of water supply																					
All districts	Aquaculture as primary activity - extensive	Top shocks - Salinization in ground water		8		1		1	9		5			1							8		
All districts	Aquaculture as primary activity - extensive	Top shocks - Disease in fish	3	30		2	8	2	24	3	15		15								10		4
All districts	Aquaculture as primary activity - extensive	Top shocks - Disease in animals/pests in crops		1																			
All districts	Aquaculture as primary activity - extensive	Top shocks - Diminishing stocks/crops	1																		2		
All districts	Aquaculture as primary activity - extensive	Top shocks - Major storms, climate related events						1		2													
All districts	Aquaculture as primary activity - extensive	Top shocks - Reduced price of crop																					
All districts	Aquaculture as primary activity - extensive	Top shocks - Reduced price of catch					2																
All districts	Aquaculture as primary activity - extensive	Top shocks - food price increase																					
All districts	Aquaculture as primary activity - extensive	Top shocks - Input price increase		5						3		19									15		
All districts	Aquaculture as primary activity - extensive	Top shocks - Serious illness or death in household		2		12	5				5	6	8								4		
All districts	Aquaculture as primary activity - extensive	Top shocks - Job loss of household member							5	1	7	8									1		
All districts	Aquaculture as primary activity - extensive	Top shocks - Displacement									1	5									6		
All districts	Aquaculture as primary activity - extensive	Top shocks - Thief/stealing of fish or shrimp							1														
All districts	Aquaculture as primary activity - extensive	Top shocks - Cannot access loan																					
All districts	Aquaculture as primary activity - intensive	Top shocks - Lack of water supply																					
All districts	Aquaculture as primary activity - intensive	Top shocks - Salinization in ground water								6													
All districts	Aquaculture as primary activity - intensive	Top shocks - Disease in fish	1	8		1		3	21	2	1		2								1		
All districts	Aquaculture as primary activity - intensive	Top shocks - Disease in animals/pests in crops																					
All districts	Aquaculture as primary activity - intensive	Top shocks - Diminishing stocks/crops																					
All districts	Aquaculture as primary activity - intensive	Top shocks - Major storms, climate related events							1	2													
All districts	Aquaculture as primary activity - intensive	Top shocks - Reduced price of crop																					
All districts	Aquaculture as primary activity - intensive	Top shocks - Reduced price of catch																					
All districts	Aquaculture as primary activity - intensive	Top shocks - food price increase																					
All districts	Aquaculture as primary activity - intensive	Top shocks - Input price increase																					
All districts	Aquaculture as primary activity - intensive	Top shocks - Serious illness or death in household				8		1	9	4													
All districts	Aquaculture as primary activity - intensive	Top shocks - Job loss of household member							1			1											
All districts	Aquaculture as primary activity - intensive	Top shocks - Displacement		2						2													
All districts	Aquaculture as primary activity - intensive	Top shocks - Thief/stealing of fish or shrimp																					
All districts	Other as primary activity	Top shocks - Cannot access loan																					
All districts	Other as primary activity	Top shocks - Lack of water supply																					
All districts	Other as primary activity	Top shocks - Salinization in ground water	1	3		1	1		10				1	4								1	
All districts	Other as primary activity	Top shocks - Disease in fish	4	28	1	3	5	3	28	2	9	1	11				1				5		
All districts	Other as primary activity	Top shocks - Disease in animals/pests in crops									2												
All districts	Other as primary activity	Top shocks - Diminishing stocks/crops	4					1													3		
All districts	Other as primary activity	Top shocks - Major storms, climate related events							1	2	1												
All districts	Other as primary activity	Top shocks - Reduced price of crop																					
All districts	Other as primary activity	Top shocks - Reduced price of catch		1																			
All districts	Other as primary activity	Top shocks - food price increase																					

Geography	Primary activity	Top shocks	Increased fishing effort - Count	Increased fish farming effort - Count	Increased farming effort - Count	Used wild rather than bought seed - Count	Reduced cost of feed for fish - Count	Reduced cost of fertilizers - Count	Received help from relatives/friends - Count	Received help from the government - Count	Relied on own savings - Count	Borrowed money - Count	Ate less - Count	Took on extra labour - Count	Had household members previously not working start - Count	Reduced health/education expenditures - Count	Sold ponds - Count	Migrated - Count	Did not do anything - Count	Reduced aquaculture/fishing scale, capacity, density - Count	Change aquaculture techniques - Count	Bought water - Count
Dam Doi	All primary activities	Top shocks - Lack of water supply										1										
Dam Doi	All primary activities	Top shocks - Salinization in ground water	1	1			2	1	26			1	5								1	
Dam Doi	All primary activities	Top shocks - Disease in fish	4	22		2	13	6	69	6	6		26				1				1	
Dam Doi	All primary activities	Top shocks - Disease in animals/pests in crops		1																		
Dam Doi	All primary activities	Top shocks - Diminishing stocks/crops	11						5	1	1											
Dam Doi	All primary activities	Top shocks - Major storms, climate related events	1			1	5	9	8	3												
Dam Doi	All primary activities	Top shocks - Reduced price of crop																				
Dam Doi	All primary activities	Top shocks - Reduced price of catch																				
Dam Doi	All primary activities	Top shocks - food price increase	5						3		3		3									
Dam Doi	All primary activities	Top shocks - Input price increase							15	10	2	25	14								1	
Dam Doi	All primary activities	Top shocks - Serious illness or death in household				13	11	3	28	4			9									
Dam Doi	All primary activities	Top shocks - Job loss of household member				4	1	7	4													
Dam Doi	All primary activities	Top shocks - Displacement						8	1	2												
Dam Doi	All primary activities	Top shocks - Thief/stealing of fish or shrimp																				
Dam Doi	All primary activities	Top shocks - Cannot access loan										1		1								
Dam Doi	Fishing as primary activity - near-shore	Top shocks - Lack of water supply																				
Dam Doi	Fishing as primary activity - near-shore	Top shocks - Salinization in ground water							1													
Dam Doi	Fishing as primary activity - near-shore	Top shocks - Disease in fish	1																			
Dam Doi	Fishing as primary activity - near-shore	Top shocks - Disease in animals/pests in crops																				
Dam Doi	Fishing as primary activity - near-shore	Top shocks - Diminishing stocks/crops	4					2		1												
Dam Doi	Fishing as primary activity - near-shore	Top shocks - Major storms, climate related events						1	2													
Dam Doi	Fishing as primary activity - near-shore	Top shocks - Reduced price of crop																				
Dam Doi	Fishing as primary activity - near-shore	Top shocks - Reduced price of catch																				
Dam Doi	Fishing as primary activity - near-shore	Top shocks - food price increase	4						1		1		1									
Dam Doi	Fishing as primary activity - near-shore	Top shocks - Input price increase																				
Dam Doi	Fishing as primary activity - near-shore	Top shocks - Serious illness or death in household																				
Dam Doi	Fishing as primary activity - near-shore	Top shocks - Job loss of household member						1														
Dam Doi	Fishing as primary activity - near-shore	Top shocks - Displacement																				
Dam Doi	Fishing as primary activity - near-shore	Top shocks - Thief/stealing of fish or shrimp																				
Dam Doi	Fishing as primary activity - near-shore	Top shocks - Cannot access loan																				
Dam Doi	Fishing as primary activity - off-shore	Top shocks - Lack of water supply																				
Dam Doi	Fishing as primary activity - off-shore	Top shocks - Salinization in ground water																				
Dam Doi	Fishing as primary activity - off-shore	Top shocks - Disease in fish																				
Dam Doi	Fishing as primary activity - off-shore	Top shocks - Disease in animals/pests in crops																				
Dam Doi	Fishing as primary activity - off-shore	Top shocks - Diminishing stocks/crops	3							1												
Dam Doi	Fishing as primary activity - off-shore	Top shocks - Major storms, climate related events	1				2	3	3	2												
Dam Doi	Fishing as primary activity - off-shore	Top shocks - Reduced price of crop																				
Dam Doi	Fishing as primary activity - off-shore	Top shocks - Reduced price of catch																				
Dam Doi	Fishing as primary activity - off-shore	Top shocks - food price increase	1																			
Dam Doi	Fishing as primary activity - off-shore	Top shocks - Input price increase									1											
Dam Doi	Fishing as primary activity - off-shore	Top shocks - Serious illness or death in household							1													
Dam Doi	Fishing as primary activity - off-shore	Top shocks - Job loss of household member						1		1												
Dam Doi	Fishing as primary activity - off-shore	Top shocks - Displacement									1	1										
Dam Doi	Fishing as primary activity - off-shore	Top shocks - Thief/stealing of fish or shrimp																				
Dam Doi	Fishing as primary activity - off-shore	Top shocks - Cannot access loan																				
Dam Doi	Aquaculture as primary activity - extensive	Top shocks - Lack of water supply									1											
Dam Doi	Aquaculture as primary activity - extensive	Top shocks - Salinization in ground water							1	6											1	
Dam Doi	Aquaculture as primary activity - extensive	Top shocks - Disease in fish	1	8			6	1	22	2	2		12									
Dam Doi	Aquaculture as primary activity - extensive	Top shocks - Disease in animals/pests in crops		1																		
Dam Doi	Aquaculture as primary activity - extensive	Top shocks - Diminishing stocks/crops																				
Dam Doi	Aquaculture as primary activity - extensive	Top shocks - Major storms, climate related events				1				2												
Dam Doi	Aquaculture as primary activity - extensive	Top shocks - Reduced price of crop																				
Dam Doi	Aquaculture as primary activity - extensive	Top shocks - Reduced price of catch																				
Dam Doi	Aquaculture as primary activity - extensive	Top shocks - food price increase									2	6									1	
Dam Doi	Aquaculture as primary activity - extensive	Top shocks - Input price increase																				
Dam Doi	Aquaculture as primary activity - extensive	Top shocks - Serious illness or death in household				3	3															
Dam Doi	Aquaculture as primary activity - extensive	Top shocks - Job loss of household member							1	3												
Dam Doi	Aquaculture as primary activity - extensive	Top shocks - Displacement									1	1										
Dam Doi	Aquaculture as primary activity - extensive	Top shocks - Thief/stealing of fish or shrimp																				
Dam Doi	Aquaculture as primary activity - extensive	Top shocks - Cannot access loan																				
Dam Doi	Aquaculture as primary activity - intensive	Top shocks - Lack of water supply																				
Dam Doi	Aquaculture as primary activity - intensive	Top shocks - Salinization in ground water							4													
Dam Doi	Aquaculture as primary activity - intensive	Top shocks - Disease in fish	1	3		1		2	14	2	1		2									
Dam Doi	Aquaculture as primary activity - intensive	Top shocks - Disease in animals/pests in crops																				
Dam Doi	Aquaculture as primary activity - intensive	Top shocks - Diminishing stocks/crops																				
Dam Doi	Aquaculture as primary activity - intensive	Top shocks - Major storms, climate related events							1	2												
Dam Doi	Aquaculture as primary activity - intensive	Top shocks - Reduced price of crop																				
Dam Doi	Aquaculture as primary activity - intensive	Top shocks - Reduced price of catch																				
Dam Doi	Aquaculture as primary activity - intensive	Top shocks - food price increase																				
Dam Doi	Aquaculture as primary activity - intensive	Top shocks - Input price increase																				
Dam Doi	Aquaculture as primary activity - intensive	Top shocks - Serious illness or death in household				3		1	3	2												
Dam Doi	Aquaculture as primary activity - intensive	Top shocks - Job loss of household member							1			1										
Dam Doi	Aquaculture as primary activity - intensive	Top shocks - Displacement																				
Dam Doi	Aquaculture as primary activity - intensive	Top shocks - Thief/stealing of fish or shrimp																				
Dam Doi	Aquaculture as primary activity - intensive	Top shocks - Cannot access loan																				
Dam Doi	Other as primary activity	Top shocks - Lack of water supply																				
Dam Doi	Other as primary activity	Top shocks - Salinization in ground water	1	1					9				1	4								
Dam Doi	Other as primary activity	Top shocks - Disease in fish	1	9		1	4		22	2	2		10								1	
Dam Doi	Other as primary activity	Top shocks - Disease in animals/pests in crops																				
Dam Doi	Other as primary activity	Top shocks - Diminishing stocks/crops	4																			
Dam Doi	Other as primary activity	Top shocks - Major storms, climate related events							1	1	1											
Dam Doi	Other as primary activity	Top shocks - Reduced price of crop																				
Dam Doi	Other as primary activity	Top shocks - Reduced price of catch																				
Dam Doi	Other as primary activity	Top shocks - food price increase																				
Dam Doi	Other as primary activity	Top shocks - Input price increase							1			3	2									
Dam Doi	Other as primary activity	Top shocks - Serious illness or death in household				3	2															
Dam Doi	Other as primary activity	Top shocks - Job loss of household member																				
Dam Doi	Other as primary activity	Top shocks - Displacement							5													
Dam Doi	Other as primary activity	Top shocks - Thief/stealing of fish or shrimp																				
Dam Doi	Other as primary activity	Top shocks - Cannot access loan									1		1									

Geography	Primary activity	Top shocks	Increased fishing effort - Count	Increased fish farming effort - Count	Increased farming effort - Count	Used wild rather than bought seed - Count	Reduced cost of feed for fish - Count	Reduced cost of fertilizers - Count	Received help from relatives/friends - Count	Received help from the government - Count	Relied on own savings - Count	Borrowed money - Count	Ate less - Count	Took on extra labour - Count	Had household members previously not working start - Count	Reduced health/education expenditures - Count	Sold ponds - Count	Migrated - Count	Did not do anything - Count	Reduced aquaculture/fishing scale, capacity, density - Count	Change aquaculture techniques - Count	Buy water - Count
Tran van Thoi	All primary activities	Top shocks - Lack of water supply																				
Tran van Thoi	All primary activities	Top shocks - Salinization in ground water				1																
Tran van Thoi	All primary activities	Top shocks - Disease in fish	2	29	1	2		1	3	1	6	1								9		7
Tran van Thoi	All primary activities	Top shocks - Disease in animals/pests in crops																				
Tran van Thoi	All primary activities	Top shocks - Diminishing stocks/crops	10				1	1	15	17		11	1							5		
Tran van Thoi	All primary activities	Top shocks - Major storms, climate related events							4													
Tran van Thoi	All primary activities	Top shocks - Reduced price of crop																				
Tran van Thoi	All primary activities	Top shocks - Reduced price of catch		1			5															
Tran van Thoi	All primary activities	Top shocks - food price increase	4						3													
Tran van Thoi	All primary activities	Top shocks - Input price increase		5			1		6	7		43	3							21		
Tran van Thoi	All primary activities	Top shocks - Serious illness or death in household	1			8	16			7		15								8		
Tran van Thoi	All primary activities	Top shocks - Job loss of household member						5		1	3									2		
Tran van Thoi	All primary activities	Top shocks - Displacement		3					1	3	1									12		1
Tran van Thoi	All primary activities	Top shocks - Thief/stealing of fish or shrimp																				
Tran van Thoi	All primary activities	Top shocks - Cannot access loan							1													
Tran van Thoi	Fishing as primary activity - near-shore	Top shocks - Lack of water supply																				
Tran van Thoi	Fishing as primary activity - near-shore	Top shocks - Salinization in ground water																				
Tran van Thoi	Fishing as primary activity - near-shore	Top shocks - Disease in fish																				
Tran van Thoi	Fishing as primary activity - near-shore	Top shocks - Disease in animals/pests in crops																				
Tran van Thoi	Fishing as primary activity - near-shore	Top shocks - Diminishing stocks/crops	1						13	14		8	1									
Tran van Thoi	Fishing as primary activity - near-shore	Top shocks - Major storms, climate related events							2													
Tran van Thoi	Fishing as primary activity - near-shore	Top shocks - Reduced price of crop																				
Tran van Thoi	Fishing as primary activity - near-shore	Top shocks - Reduced price of catch																				
Tran van Thoi	Fishing as primary activity - near-shore	Top shocks - food price increase																				
Tran van Thoi	Fishing as primary activity - near-shore	Top shocks - Input price increase							5	6		19										
Tran van Thoi	Fishing as primary activity - near-shore	Top shocks - Serious illness or death in household					8			3		3										
Tran van Thoi	Fishing as primary activity - near-shore	Top shocks - Job loss of household member																				
Tran van Thoi	Fishing as primary activity - near-shore	Top shocks - Displacement																				
Tran van Thoi	Fishing as primary activity - near-shore	Top shocks - Thief/stealing of fish or shrimp																				
Tran van Thoi	Fishing as primary activity - near-shore	Top shocks - Cannot access loan																				
Tran van Thoi	Fishing as primary activity - off-shore	Top shocks - Lack of water supply																				
Tran van Thoi	Fishing as primary activity - off-shore	Top shocks - Salinization in ground water																				
Tran van Thoi	Fishing as primary activity - off-shore	Top shocks - Disease in fish																				
Tran van Thoi	Fishing as primary activity - off-shore	Top shocks - Disease in animals/pests in crops																				
Tran van Thoi	Fishing as primary activity - off-shore	Top shocks - Diminishing stocks/crops																				
Tran van Thoi	Fishing as primary activity - off-shore	Top shocks - Major storms, climate related events	9																			
Tran van Thoi	Fishing as primary activity - off-shore	Top shocks - Reduced price of crop																				
Tran van Thoi	Fishing as primary activity - off-shore	Top shocks - Reduced price of catch																				
Tran van Thoi	Fishing as primary activity - off-shore	Top shocks - food price increase	4						1													
Tran van Thoi	Fishing as primary activity - off-shore	Top shocks - Input price increase																		2		
Tran van Thoi	Fishing as primary activity - off-shore	Top shocks - Serious illness or death in household	1									6								3		
Tran van Thoi	Fishing as primary activity - off-shore	Top shocks - Job loss of household member																				
Tran van Thoi	Fishing as primary activity - off-shore	Top shocks - Displacement																				
Tran van Thoi	Fishing as primary activity - off-shore	Top shocks - Thief/stealing of fish or shrimp																				
Tran van Thoi	Fishing as primary activity - off-shore	Top shocks - Cannot access loan									1											
Tran van Thoi	Aquaculture as primary activity - extensive	Top shocks - Lack of water supply																				
Tran van Thoi	Aquaculture as primary activity - extensive	Top shocks - Salinization in ground water																				
Tran van Thoi	Aquaculture as primary activity - extensive	Top shocks - Disease in fish	1	13						1	5									5		4
Tran van Thoi	Aquaculture as primary activity - extensive	Top shocks - Disease in animals/pests in crops																				
Tran van Thoi	Aquaculture as primary activity - extensive	Top shocks - Diminishing stocks/crops																				
Tran van Thoi	Aquaculture as primary activity - extensive	Top shocks - Major storms, climate related events																				
Tran van Thoi	Aquaculture as primary activity - extensive	Top shocks - Reduced price of crop																				
Tran van Thoi	Aquaculture as primary activity - extensive	Top shocks - Reduced price of catch				2																
Tran van Thoi	Aquaculture as primary activity - extensive	Top shocks - food price increase																				
Tran van Thoi	Aquaculture as primary activity - extensive	Top shocks - Input price increase	4									8								13		
Tran van Thoi	Aquaculture as primary activity - extensive	Top shocks - Serious illness or death in household										3										
Tran van Thoi	Aquaculture as primary activity - extensive	Top shocks - Job loss of household member					2		1	2										1		
Tran van Thoi	Aquaculture as primary activity - extensive	Top shocks - Displacement										1								5		
Tran van Thoi	Aquaculture as primary activity - extensive	Top shocks - Thief/stealing of fish or shrimp																				
Tran van Thoi	Aquaculture as primary activity - extensive	Top shocks - Cannot access loan																				
Tran van Thoi	Aquaculture as primary activity - intensive	Top shocks - Lack of water supply																				
Tran van Thoi	Aquaculture as primary activity - intensive	Top shocks - Salinization in ground water																				
Tran van Thoi	Aquaculture as primary activity - intensive	Top shocks - Disease in fish	4							2										1		
Tran van Thoi	Aquaculture as primary activity - intensive	Top shocks - Disease in animals/pests in crops																				
Tran van Thoi	Aquaculture as primary activity - intensive	Top shocks - Diminishing stocks/crops																				
Tran van Thoi	Aquaculture as primary activity - intensive	Top shocks - Major storms, climate related events																				
Tran van Thoi	Aquaculture as primary activity - intensive	Top shocks - Reduced price of crop																				
Tran van Thoi	Aquaculture as primary activity - intensive	Top shocks - Reduced price of catch																				
Tran van Thoi	Aquaculture as primary activity - intensive	Top shocks - food price increase																				
Tran van Thoi	Aquaculture as primary activity - intensive	Top shocks - Input price increase																				
Tran van Thoi	Aquaculture as primary activity - intensive	Top shocks - Serious illness or death in household					1															
Tran van Thoi	Aquaculture as primary activity - intensive	Top shocks - Job loss of household member																				
Tran van Thoi	Aquaculture as primary activity - intensive	Top shocks - Displacement				2				2												
Tran van Thoi	Aquaculture as primary activity - intensive	Top shocks - Thief/stealing of fish or shrimp																				
Tran van Thoi	Aquaculture as primary activity - intensive	Top shocks - Cannot access loan																				
Tran van Thoi	Other as primary activity	Top shocks - Lack of water supply																				
Tran van Thoi	Other as primary activity	Top shocks - Salinization in ground water				1																
Tran van Thoi	Other as primary activity	Top shocks - Disease in fish	1	12	1	2		1				1	1							3		
Tran van Thoi	Other as primary activity	Top shocks - Disease in animals/pests in crops																				
Tran van Thoi	Other as primary activity	Top shocks - Diminishing stocks/crops				1																
Tran van Thoi	Other as primary activity	Top shocks - Major storms, climate related events							1													
Tran van Thoi	Other as primary activity	Top shocks - Reduced price of crop																				
Tran van Thoi	Other as primary activity	Top shocks - Reduced price of catch		1																		
Tran van Thoi	Other as primary activity	Top shocks - food price increase																				
Tran van Thoi	Other as primary activity	Top shocks - Input price increase					1			1		6	3									
Tran van Thoi	Other as primary activity	Top shocks - Serious illness or death in household				5	5													4		
Tran van Thoi	Other as primary activity	Top shocks - Job loss of household member					3				1									1		
Tran van Thoi	Other as primary activity	Top shocks - Displacement							1	1										5		1
Tran van Thoi	Other as primary activity	Top shocks - Thief/stealing of fish or shrimp																				
Tran van Thoi	Other as primary activity	Top shocks - Cannot access loan																				

Geography	Primary activity	Top shocks	Increased fishing effort - Count	Increased fish farming effort - Count	Increased farming effort - Count	Used wild rather than bought seed - Count	Reduced cost of feed for fish - Count	Reduced cost of fertilizers - Count	Received help from relatives/friends - Count	Received help from the government - Count	Relied on own savings - Count	Borrowed money - Count	Ate less - Count	Took on extra labour - Count	Had household members previously not working start - Count	Reduced health/education expenditures - Count	Sold ponds - Count	Migrated - Count	Did not do anything - Count	Reduced aquaculture/fishing scale, capacity, density - Count	Change aquaculture techniques - Count	Buy water - Count
Hue	All primary activities	Top shocks - Lack of water supply																				
Hue	All primary activities	Top shocks - Salinization in ground water		8		1					7									1	11	1
Hue	All primary activities	Top shocks - Disease in fish	4	18		4		1	1		13		1								9	
Hue	All primary activities	Top shocks - Disease in animals/pests in crops									1											
Hue	All primary activities	Top shocks - Diminishing stocks/crops	4								5								10	21		
Hue	All primary activities	Top shocks - Major storms, climate related events																				
Hue	All primary activities	Top shocks - Reduced price of crop																				
Hue	All primary activities	Top shocks - Reduced price of catch																				
Hue	All primary activities	Top shocks - food price increase	2										3						3			
Hue	All primary activities	Top shocks - Input price increase										20										
Hue	All primary activities	Top shocks - Serious illness or death in household		1		1				3	26	7									7	
Hue	All primary activities	Top shocks - Job loss of household member						7		4	10											
Hue	All primary activities	Top shocks - Displacement		2							4											
Hue	All primary activities	Top shocks - Thief/stealing of fish or shrimp						3														
Hue	All primary activities	Top shocks - Cannot access loan									1											
Hue	Fishing as primary activity - near-shore	Top shocks - Lack of water supply																			2	
Hue	Fishing as primary activity - near-shore	Top shocks - Salinization in ground water																		1	13	
Hue	Fishing as primary activity - near-shore	Top shocks - Disease in fish	1	3		2															2	
Hue	Fishing as primary activity - near-shore	Top shocks - Disease in animals/pests in crops																				
Hue	Fishing as primary activity - near-shore	Top shocks - Diminishing stocks/crops	2								4								7	18		
Hue	Fishing as primary activity - near-shore	Top shocks - Major storms, climate related events	2										1									
Hue	Fishing as primary activity - near-shore	Top shocks - Reduced price of crop																				
Hue	Fishing as primary activity - near-shore	Top shocks - Reduced price of catch										1										
Hue	Fishing as primary activity - near-shore	Top shocks - food price increase				1					2									1		
Hue	Fishing as primary activity - near-shore	Top shocks - Input price increase					2			1	2											
Hue	Fishing as primary activity - near-shore	Top shocks - Serious illness or death in household		1							14											
Hue	Fishing as primary activity - near-shore	Top shocks - Job loss of household member						2														
Hue	Fishing as primary activity - near-shore	Top shocks - Displacement									3											
Hue	Fishing as primary activity - near-shore	Top shocks - Thief/stealing of fish or shrimp																				
Hue	Fishing as primary activity - near-shore	Top shocks - Cannot access loan																				
Hue	Fishing as primary activity - off-shore	Top shocks - Lack of water supply																				
Hue	Fishing as primary activity - off-shore	Top shocks - Salinization in ground water																				
Hue	Fishing as primary activity - off-shore	Top shocks - Disease in fish																			1	
Hue	Fishing as primary activity - off-shore	Top shocks - Disease in animals/pests in crops																				
Hue	Fishing as primary activity - off-shore	Top shocks - Diminishing stocks/crops	1																			
Hue	Fishing as primary activity - off-shore	Top shocks - Major storms, climate related events																				
Hue	Fishing as primary activity - off-shore	Top shocks - Reduced price of crop																				
Hue	Fishing as primary activity - off-shore	Top shocks - Reduced price of catch																				
Hue	Fishing as primary activity - off-shore	Top shocks - food price increase									1	1										
Hue	Fishing as primary activity - off-shore	Top shocks - Input price increase																				
Hue	Fishing as primary activity - off-shore	Top shocks - Serious illness or death in household																				
Hue	Fishing as primary activity - off-shore	Top shocks - Job loss of household member																				
Hue	Fishing as primary activity - off-shore	Top shocks - Displacement																				
Hue	Fishing as primary activity - off-shore	Top shocks - Thief/stealing of fish or shrimp																				
Hue	Fishing as primary activity - off-shore	Top shocks - Cannot access loan																				
Hue	Aquaculture as primary activity - extensive	Top shocks - Lack of water supply																				
Hue	Aquaculture as primary activity - extensive	Top shocks - Salinization in ground water		7		1					5			1							7	
Hue	Aquaculture as primary activity - extensive	Top shocks - Disease in fish	1	8		2			1		8		1								5	
Hue	Aquaculture as primary activity - extensive	Top shocks - Disease in animals/pests in crops																				
Hue	Aquaculture as primary activity - extensive	Top shocks - Diminishing stocks/crops	1																		2	
Hue	Aquaculture as primary activity - extensive	Top shocks - Major storms, climate related events																				
Hue	Aquaculture as primary activity - extensive	Top shocks - Reduced price of crop																				
Hue	Aquaculture as primary activity - extensive	Top shocks - Reduced price of catch																				
Hue	Aquaculture as primary activity - extensive	Top shocks - food price increase	1							3	1										2	
Hue	Aquaculture as primary activity - extensive	Top shocks - Input price increase							1	1	1											
Hue	Aquaculture as primary activity - extensive	Top shocks - Serious illness or death in household																				
Hue	Aquaculture as primary activity - extensive	Top shocks - Job loss of household member						2														
Hue	Aquaculture as primary activity - extensive	Top shocks - Displacement																				
Hue	Aquaculture as primary activity - extensive	Top shocks - Thief/stealing of fish or shrimp							1													
Hue	Aquaculture as primary activity - intensive	Top shocks - Cannot access loan																				
Hue	Aquaculture as primary activity - intensive	Top shocks - Lack of water supply																				
Hue	Aquaculture as primary activity - intensive	Top shocks - Salinization in ground water																				
Hue	Aquaculture as primary activity - intensive	Top shocks - Disease in fish																				
Hue	Aquaculture as primary activity - intensive	Top shocks - Disease in animals/pests in crops																				
Hue	Aquaculture as primary activity - intensive	Top shocks - Diminishing stocks/crops																				
Hue	Aquaculture as primary activity - intensive	Top shocks - Major storms, climate related events																				
Hue	Aquaculture as primary activity - intensive	Top shocks - Reduced price of crop																				
Hue	Aquaculture as primary activity - intensive	Top shocks - Reduced price of catch																				
Hue	Aquaculture as primary activity - intensive	Top shocks - food price increase																				
Hue	Aquaculture as primary activity - intensive	Top shocks - Input price increase																				
Hue	Aquaculture as primary activity - intensive	Top shocks - Serious illness or death in household																				
Hue	Aquaculture as primary activity - intensive	Top shocks - Job loss of household member																				
Hue	Aquaculture as primary activity - intensive	Top shocks - Displacement																				
Hue	Aquaculture as primary activity - intensive	Top shocks - Thief/stealing of fish or shrimp									1		1									
Hue	Aquaculture as primary activity - intensive	Top shocks - Cannot access loan																				
Hue	Other as primary activity	Top shocks - Lack of water supply																				
Hue	Other as primary activity	Top shocks - Salinization in ground water																				
Hue	Other as primary activity	Top shocks - Disease in fish	2	7				1			5											
Hue	Other as primary activity	Top shocks - Disease in animals/pests in crops																				
Hue	Other as primary activity	Top shocks - Diminishing stocks/crops																				
Hue	Other as primary activity	Top shocks - Major storms, climate related events																				
Hue	Other as primary activity	Top shocks - Reduced price of crop																				
Hue	Other as primary activity	Top shocks - Reduced price of catch																				
Hue	Other as primary activity	Top shocks - food price increase										3										
Hue	Other as primary activity	Top shocks - Input price increase									1											
Hue	Other as primary activity	Top shocks - Serious illness or death in household																				
Hue	Other as primary activity	Top shocks - Job loss of household member						3														
Hue	Other as primary activity	Top shocks - Displacement																				
Hue	Other as primary activity	Top shocks - Thief/stealing of fish or shrimp									1		1									
Hue	Other as primary activity	Top shocks - Cannot access loan																				

Appendix VIId
Vietnam Transitions Survey – Perceptions of risks and coping by primary activity by district

	All Districts						Dan Doi						Tran van Thoi						Hue					
	All sectors	Fishing as primary activity - near-shore	Fishing as primary activity - off-shore	Aquaculture as primary activity - extensive	Aquaculture as primary activity - intensive	Other as primary activity	All sectors	Fishing as primary activity - near-shore	Fishing as primary activity - off-shore	Aquaculture as primary activity - extensive	Aquaculture as primary activity - intensive	Other as primary activity	All sectors	Fishing as primary activity - near-shore	Fishing as primary activity - off-shore	Aquaculture as primary activity - extensive	Aquaculture as primary activity - intensive	Other as primary activity	All sectors	Fishing as primary activity - near-shore	Fishing as primary activity - off-shore	Aquaculture as primary activity - extensive	Aquaculture as primary activity - intensive	Other as primary activity
Primary sector																								
Total number of households	599	127	67	210	46	149	220	15	19	77	34	75	179	34	42	45	12	46	200	78	6	88		28
Household's 2002 standard of living was lower than in 2012 - Count	443	106	59	136	40	102	139	7	15	41	30	46	145	33	38	28	10	36	159	66	6	67		20
Household's 2002 standard of living was the same as in 2012 - Count	109	14	6	51	4	34	70	6	4	31	4	25	18	1	2	10	0	5	21	7	0	10		4
Household's 2002 standard of living was better than in 2012 - Count	42	7	2	22	2	9	11	2	0	5	0	4	11	0	2	6	2	1	20	5	0	11		4
Household's standard of living is relatively poor compared to others in the village - Count	93	31	8	29	2	23	50	13	7	15	2	13	11	1	1	5	0	4	32	17	0	9		6
Household's standard of living is average compared to others in the village - Count	447	94	54	165	27	107	136	2	11	56	17	50	153	32	37	38	10	36	158	60	6	71		21
Household's standard of living is relatively wealthy compared to others in the village - Count	53	2	5	14	17	15	32	0	1	5	15	11	11	1	4	1	2	3	10	1	0	8		1
Household's tolerance for risk is higher compared to others in the village - Count	85	14	14	21	11	25	49	8	3	11	9	18	18	0	11	1	2	4	18	6	0	9		3
Household's tolerance for risk is average compared to others in the village - Count	421	92	45	155	28	101	121	5	10	45	18	43	156	33	30	43	10	40	144	54	5	67		18
Household's tolerance for risk is lower compared to others in the village - Count	85	21	6	31	7	20	46	2	5	19	7	13	1	1	0	0	0	0	38	18	1	12		7
Household's riskiest livelihood activity is N/A - Count	81	24	9	33	2	13	19	7	7	4	0	1	52	17	2	19	2	12	10	0	0	10		0
Household's riskiest livelihood activity is intensive shrimp culture - Count	70	1	0	12	34	23	56	1	0	11	28	16	14	0	0	1	6	7	0	0	0	0		0
Household's riskiest livelihood activity is semi-intensive shrimp culture - Count	288	46	6	139	9	88	113	2	1	57	5	48	48	0	0	22	4	22	127	44	5	60		18
Household's riskiest livelihood activity is improved extensive shrimp culture - Count	5	0	0	3	0	2	5	0	0	3	0	2	0	0	0	0	0	0	0	0	0	0		0
Household's riskiest livelihood activity is fishing - Count	70	38	14	6	0	12	15	4	8	1	0	2	25	17	5	0	0	3	30	17	1	5		7
Household's riskiest livelihood activity is animal raising - Count	3	0	0	3	0	0	1	0	0	1	0	0	2	0	0	2	0	0	0	0	0	0		0
Household's least risky livelihood activity is N/A - Count	144	24	22	54	15	29	63	9	11	18	10	15	70	15	11	25	5	14	11	0	0	11		0
Household's least risky livelihood activity is traditional culture - Count	26	0	2	7	11	6	19	0	1	5	9	4	6	0	1	2	2	1	1	0	0	0		1
Household's least risky livelihood activity is crab culture - Count	53	2	2	31	7	11	44	2	1	24	7	10	9	0	1	7	0	1	0	0	0	0		0
Household's least risky livelihood activity is fish culture - Count	8	1	0	3	2	2	6	0	0	2	2	2	2	1	0	1	0	0	0	0	0	0		0
Household's least risky livelihood activity is crops - Count	77	18	3	24	3	29	10	0	1	5	0	4	39	13	2	5	3	16	28	5	0	14		9
Household's least risky livelihood activity is self-employment (middle-person) - Count	17	0	0	4	3	10	11	0	0	1	3	7	1	0	0	0	0	1	5	0	0	3		2
Household's least risky livelihood activity is self-employment (other) - Count	29	3	3	9	0	14	12	1	1	3	0	7	5	1	2	0	0	2	12	1	0	6		5
Household's least risky livelihood activity is wage work - Count	79	21	9	24	1	24	23	1	2	6	1	13	8	1	3	0	0	4	48	19	4	18		7
Household's least risky livelihood activity is animal raising - Count	33	5	0	14	1	13	18	1	0	9	0	8	12	3	0	3	1	5	3	1	0	2		0
Household's least risky livelihood activity is mollusc culture - Count	2	0	0	1	1	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1		0
Household's least risky livelihood activity is inland fishing - Count	41	29	2	9	0	1	3	0	0	3	0	0	0	0	0	0	0	0	38	29	2	6		1
Household's preferred livelihood activity - Yes	102	31	14	23	1	33	50	11	5	13	0	21	32	12	7	6	1	6	20	8	2	4		6
Household's preferred livelihood activity - No	482	93	51	183	44	111	163	4	14	62	33	50	143	22	33	38	11	39	176	67	4	83		22
Household's preferred livelihood activity is not known - Count	4	1	0	1	0	2	1	0	0	1	0	0	2	1	0	0	0	1	1	0	0	0		1
Household's preferred livelihood activity is self-employment - Count	31	4	4	14	0	9	22	4	3	8	0	7	7	0	0	5	0	2	2	0	1	1		0
Household's preferred livelihood activity is aquaculture - Count	21	10	3	1	0	7	11	5	2	0	0	4	1	0	1	0	0	0	9	5	0	1		3
Household's preferred livelihood activity is intensive shrimp culture - Count	4	0	0	2	0	2	4	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0		0
Household's preferred livelihood activity is improved shrimp culture - Count	7	0	0	2	0	7	7	0	0	2	0	5	0	0	0	0	0	0	0	0	0	0		0
Household's preferred livelihood activity is fishing - Count	3	1	0	0	0	2	2	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0		0
Household's preferred livelihood activity is wage work - Count	8	3	0	1	0	4	3	1	0	0	0	2	1	1	0	0	0	0	4	1	0	1		2
Household's preferred livelihood activity is farming - Count	2	0	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	1		0
Household's preferred livelihood activity is fixed fishing gear - Count	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0		0
Household's preferred livelihood activity is high technique fishing gear - Count	6	0	6	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	1	0	1	0		0
Household's preferred livelihood activity is offshore fishing - Count	11	10	1	0	0	0	0	0	0	0	0	0	11	10	1	0	0	0	0	0	0	0		0
Main obstacle to household switching to preferred main livelihood activity is loan - Count	52	22	11	11	0	8	18	5	3	4	0	6	22	10	6	4	0	2	12	7	2	3		0
Main obstacle to household switching to preferred main livelihood activity is no land - Count	10	4	2	1	0	3	10	4	2	1	0	3	0	0	0	0	0	0	0	0	0	0		0
Main obstacle to household switching to preferred main livelihood activity is poor market - Count	1	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0		0
Main obstacle to household switching to preferred main livelihood activity is skills - Count	12	1	0	3	0	8	7	0	0	2	0	5	0	0	0	0	0	0	5	1	0	1		3
Main obstacle to household switching to preferred main livelihood activity is soil salinity - Count	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0		0
Main obstacle to household switching to preferred main livelihood activity is age - Count	2	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0		1