

The Role of Fisherwomen in the Face of Fishing Uncertainties on the North Coast of Java, Indonesia

ZUZY ANNA*

Faculty of Fisheries and Marine Science, Padjadjaran University, Indonesia.

Abstract

Those engaged in fishing, especially in small scale fishing, are very susceptible to uncertainties. Women members of fisher families, who tend to be responsible for managing the family's food, face the problems of uncertainty first, especially when income is threatened. This paper assesses the roles of fisherwomen in adapting to uncertainties in two coastal communities of northern Java, Indonesia. It developed indicators of uncertainties with respect to fisheries livelihoods and tested these indicators using a multi-dimensional scaling method based on a modified version of the Rapid Appraisal for Fisheries (Rapfish) method. This technique is used for the first time to analyse the role of women in dealing with uncertainty in fishing. The paper also describes how empowerment of local communities can be used as a cushion for absorbing income fluctuations due to uncertainties. The research concludes that development programmes should also take into account the uncertainty in fisheries from the women's point of view. Governments should pay attention to the dynamic of all dimensions of uncertainties, especially the fisherwomen whose husbands are fishermen as this group suffers the most, directly and indirectly, from uncertainties in fishing and changing climate.

Introduction

Fisherwomen, defined as fishermen's wives and women who themselves work in fisheries activities, play an important role in coastal economic activities. Their contribution is often overlooked in analyses of fisheries. Fisherwomen are actively involved in input and output markets as well as in supporting markets for fishing activities. In the fisheries along the north coast of Java, Indonesia, at input markets women provide logistic support for fishing activities, while at output markets fisherwomen are often the main players in fish selling and distribution. Fishermen's wives are also involved actively in generating additional family incomes from activities inside and outside fisheries. When fishermen face uncertainties such as seasonal variations, women often become the backbone of the family and are important for its survival. Fisherwomen are therefore an integral and functional part of coastal fishing industries.

* Corresponding author. E-mail address: suzyanna18@gmail.com

Fishing is regarded as a business with a high degree of uncertainty from many causes. Acheson (1981) notes that fishing uncertainty stems not only from the physical environment, but also from the social environment in which fishing takes place. The nature of fishing forces fishers to endure long work hours away from their families, causing physical and psychological problems for them and their families (Acheson, 1981). Under such circumstances, family members, including wives and children are forced to play roles in the survival of the household economies. On the other hand, the involvement of coastal communities as a whole helps to reduce the socio-economic impacts arising from the uncertainties of fishing. Social networks, for example, are often regarded as cushions in the case of uncertainties, such as when catches and incomes fluctuate. Within social networks, fishermen are able to borrow and lend money and other necessities. Fisherwomen often play the most significant roles in these networks, bridging the gaps among the social hierarchies. The complex economic networks for catching, selling, distributing and processing of the fish products often involve the women. The role of fisherwomen in these activities can have an important influence on the way economic networks function. Therefore, analysis of fisheries and the coastal economy needs to incorporate gender as an essential element if their functioning is to be fully understood.

Methods

Analysis of uncertainty was carried out using primary data obtained from field surveys. A structured questionnaire of 55 questions was used. The questionnaire was divided into three blocks of questions consisting of those for demographic profiles, economic and social profiles, and the perception of uncertainties. Fifty fisherwomen each from the two coastal cities of Semarang and Pekalongan were surveyed (Figure 1). Focus group discussions (FGD) were also conducted to obtain in-depth information on the perceptions of uncertainties.

In order to capture a variety of women's activities in coastal areas, the study divided fisherwomen into two groups. The first group consisted of the wives of fishermen who had fishing vessels of less than 10 gross tonnes (coded as FW1) and the other group was of women who were engaged in fishing related activities, not necessarily the wives of fishers (coded as FW2). The husbands of this second group might engage in non-fishing activities such "ojek" (motor taxi driver), trader at local market, worker in property business and road development, house builder, and other non formal jobs, including those who were unemployed.



Fig 1. Map of Java and study area.

The analysis of uncertainties concerning fisherwomen in coastal areas was carried out using the Rapid Appraisal for Fisheries (Rapfish) technique developed by Pitcher and Preikshot (2001) and Alder et al. (2001) for fisheries and modified for this study. First, indicators of uncertainties associated with women's activities in relation to fishing and fishing-related activities were developed.

These indicators were then assessed by assigning Likert scores indicating the degree of severity in terms of uncertainties within economic, social, ecological and institutional frameworks. On this scale, poor scores indicated severe uncertainty and high scores indicated low levels of uncertainty. The assessment was based on first-hand observations, information gathered from focus group discussions and secondary data available from several sources. After assessing the indicators, the next step was to compute the uncertainty index using Rapfish software to determine the relative position of each fisherwomen's group within the index. The leverage level was also calculated for the possible changes in determinant indicators which were sensitive to uncertainties.

The ecological indicators of uncertainties included the relative indicators such as seasonal factors, flood, pollution, and erosion (Table 1). The economic indicators were indicators of uncertainties which impacted the income of fisherwomen both directly and indirectly, including volatility of fish production which indirectly affected the financial portfolio of households in which women were in charge. With regard to the institution dimensions, indicator of uncertainty included variables which were related to the role of fisheries and government, as well as financial institutions and the roles of women in institutions. Uncertainties in these institutions can lead to instability in the

fisher's household as a whole. Within the social framework, the indicators of uncertainties included variables associated with social disturbances such as local political situations, levels of unemployment, crime, health conditions and family instability.

The inclusion of family instability is important. The northern coastal area of the Java Sea is an area well known for high numbers of divorces. Divorce leads to family instability and women usually suffer the most. Divorce is even more difficult in low income families such as fishing families. To survive, women have to deal with the consequences of divorce. Berman (1981) noted that family instability such as divorce could also lead to economic uncertainty. In his study of families in Israel, he showed that divorce rates and economic uncertainty were strongly correlated.

These indicators, to some extent, are compatible with the framework of response to uncertainty in fishing developed earlier by Acheson (1981). Acheson (1981) emphasised that in response to uncertainties, fishers and their families used clusters and institutions for support. Clustering included developing sharing systems, using kinships, and developing relationships with middlemen to reduce uncertainties in marketing and distribution. In terms of mechanisms to develop institutions, Acheson (1981) mentioned the role of cooperatives and other institutional arrangements such as information exchange to reduce uncertainties.

Table 1. Indicators of gender uncertainty in north coast of Java to be used for Rapfish analysis.

Dimension	Indicators of gender uncertainty
Ecological	High frequency of floods; seasonal factors/tides; coastal erosion; pollution; stock availability; impacts of drought, coastal degradation
Economic	Volatility in husband's income; volatility in woman's own income; accessibility to resources; production volatility/input volatility; volatility in prices; volatility in markets
Social	Instability in local politics; crime; family instability; unemployment of family members; health condition; conflict status
Institutional	Uncertainty in government support; women's participation; dependency on local financiers; dependency in credit and saving; dependency in social network; dependency on other family members to support; participation in local organisations; uncertainty in costs of children's education

Once all indicators have been scored and assessed, Rapfish uses Multi Dimensional Scaling (MDS) techniques to arrange the units of the studies according to their range of attributes. The results of the MDS-Rapfish analysis were in the form of index numbers ranging from 0 (bad index score) to 100 (good index score). These results were then converted into kite diagrams to describe the relative positions of each of the units of analysis within ecological, economic, social and institutional dimensions.

Results

Overview of north coast of Java fisheries

The area of the north coast of Java is heavily fishery-dependent and poverty and over fishing are well documented. Several factors contribute to these conditions. First, historically, the north coast of Java is very densely settled due to its easy road access. Second, fishing has been practiced since the Dutch era and the area has been one of the main engines of growth for Indonesian fisheries. Third, the north coast of Java has become the center of industries that discharge their pollution to coastal areas. Fourth, this coastal area is also experiencing climate change, characterised by sea level rise, high tides, droughts and floods. The interaction of these factors contributes to the overfishing of the coastal resources which leads to uncertainties in livelihoods and to poverty (Fauzi and Anna, 2010).

Two important fishing areas are around Pekalongan and Semarang. These two coastal cities have been the main hubs of fishing networks on the Java coast. Pekalongan has been the center of landings of small pelagic fish which are then distributed across the country. Besides the production of “*batik*” (handcrafted decorated cloth), fishing is still the dominant economic activity. The total local production of small pelagic fish is 338,970 tons compared to 15,946 tons of large pelagic fish, and 257,986 tons of demersal fish (Indonesian Fisheries Statistics, 2011). Landings of fish, however, are declining, leading to slowed economic contributions from fish related activities. Some contend that overcapacity of fishing vessels too many boat chasing too few fish) in the Java sea is the main cause of the decline in fish production (Squires et al. 2002), whereas others believe that natural phenomena such as climate change are contributing to the decline in fish stocks and catches (Fauzi and Anna, 2010). This latter claim has been supported by the fact that those two areas are the most vulnerable to inundation from sea water or sea level rise, locally known as flood or *rob*. The *rob*, due also to land subsidence as well as sea level rise, has become more frequent over the years (50 cm rise in average sea level, including the land subsidence, over the past 12 years in Semarang) and has caused drastic declines in the ability of fishermen to go to fishing, resulting in lower productivity (Diposaptono et al. 2009). The *rob* has also caused an enormous economic loss due to coastal infrastructure damage, including to fishermen’s houses. Few people are aware of the climate change dimensions, which many believe is a *salah mongso* or false climate phenomenon.

As elsewhere in coastal areas, fishing on the north coast of Java is predominantly carried out by men. However, by tradition, women are actively involved in the fishing economy. Even though they do not directly go to sea or fish, women are now the main players in fish trading and in the distribution of fish products as well as in fish processing. They are also commonly found in other supporting economic activities such as running kiosks and providing financial support at local scales (Figure 2).

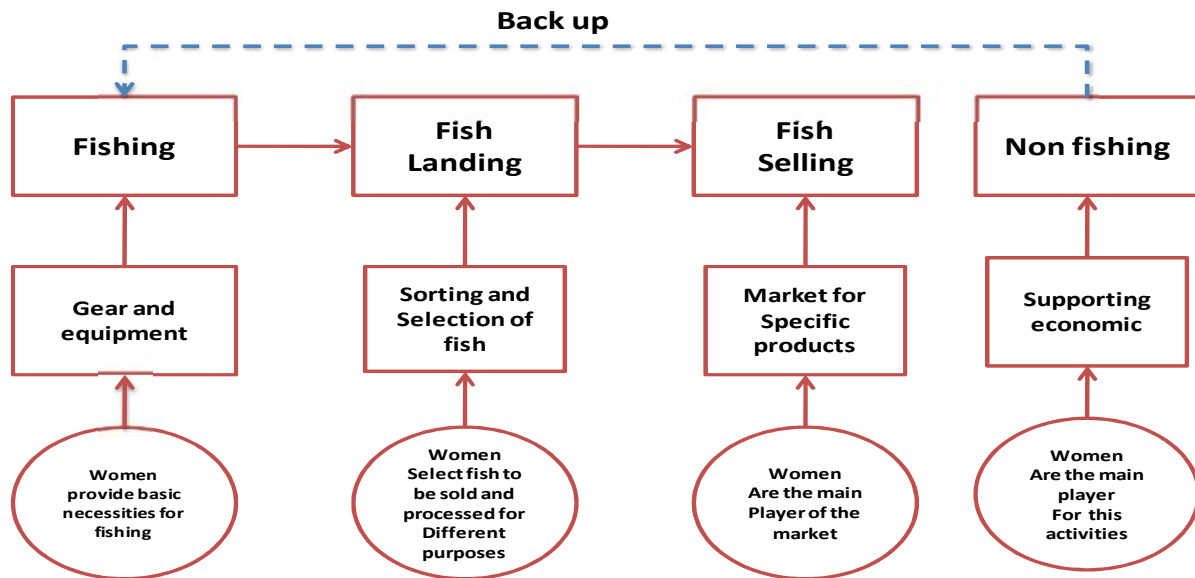


Fig 2. Gender dimension in fishing activities in north coast of Java.

Rapfish uncertainty assessment results

Data on fisherwomen's daily time budgets were combined for the two cities (Semarang and Pekalongan) and the averages of the aggregates compared for the two different types of fisherwomen and the high and low fishing season. Fisherwomen in the coastal area of Semarang and Pekalongan spend considerable time working and looking after household affairs (Figure 3). During the low fishing season, wives of fishermen spend on average around half (46%, 11 hrs) of their day working, compared with 22% (5 hrs) during the high season (FW1LS versus FW1HS in Figure 3). This indicates that during the low season, women worked harder to compensate for the fluctuation in household income due to low catches. They compensated for the low income from fishing related activities by engaging in other productive activities such as working as house maids and selling food in the neighborhood. In contrast, the group of other women who engaged in fishing related activities showed a different seasonal pattern of work (FW2LS versus FW2HS). They worked less during the low season (21%, 5 hrs) but worked more during the high season (50%, 12 hrs). The reason of this different pattern is that these groups depended very much upon the fish landed by fishermen but in different ways. When fishing was low, the number of fish to be processed and sold for different markets was relatively low so that the FW2 fisherwomen's group worked less and spent more of their time in leisure. When the fishing season was high (FW2HS), they spent more time working in processing the fish.

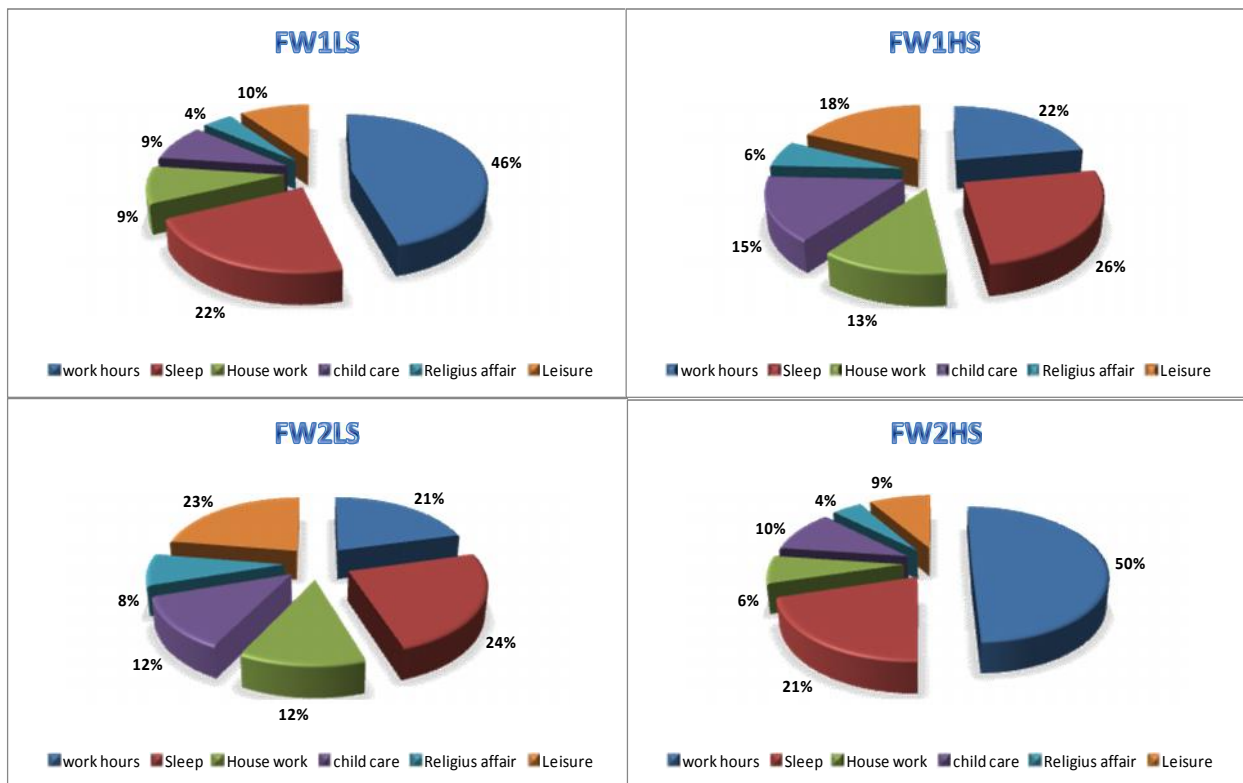


Fig 3. Women's daily activity patterns.

These results can be related to those from a study by Amirullah (2003), which found that the time spent on fishing activities by women in coastal areas of North Sulawesi was about half of that spent by the fishermen. He concluded that women played a significant role in maintaining the food security of the fisher's family and that their contributions could not be neglected since it supported the family's food security. Women in the coastal area of North Sulawesi frequently assisted their husbands in fishing; some even took the boats out and fished by themselves. In addition, they were also involved in seaweed culture and the collection of sea cucumbers. These activities significantly added to family incomes and, to some extent, women were the saviors of the household family income.

Considerable differences in income were found between the women's groups with regard to the proportion of income relative to expenditure and to their husband's incomes (Table 2). Wives of fishermen from Semarang (FWS1HS and FWS1LS) earned about US\$50 mth⁻¹ during the high season and US\$75 mth⁻¹ during the low season. These numbers were approximately 32% and 90% of their husband's incomes, respectively. The ratios of income to expenditure of the first group during the high season and low season were about 72% and 65%, respectively. The second group of women (FWS2HS and FWS2LS) earned around US\$120 mth⁻¹ during the high season and US\$80 mth⁻¹ during the low season. For this group, the ratio of their income to that of their husbands in the two different seasons was 67% and 40%, respectively. The proportion of household expenditure to income for this group was slightly less than that for the first group, namely 60% and 64%,

respectively for the high season and the low season. The profile was approximately the same for comparable groups from Pekalongan (FWP1HS, FWP1LS, FWP2HS and FWP2LS).

Table 2. Income and expenditure profile of north Java coastal communities. (WI = wives income; HI = husband's income). N=50 in each group; values in brackets are the standard deviations.

Group	Women's Income (WI) (US Dollars)	Husband's Income (HI) (US Dollars)	Total Expenditure (TE) (US Dollars)	Ratio WI to HI	Ratio WI to TE	Ratio HI to TE
Semarang						
FWS1HS	50 (4.7)	157.5 (40.0)	220 (48.1)	0.32	0.23	0.72
FWS1LS	75 (8.4)	83 (15.1)	127.5 (44.8)	0.90	0.59	0.65
FWS2HS	120 (27.4)	180 (42.2)	300 (41.3)	0.67	0.40	0.60
FWS2LS	80 (14.3)	160 (27.2)	250 (33.9)	0.50	0.32	0.64
Pekalongan						
FWP1HS	62(11.4)	148 (432.9)	250 (43.8)	0.42	0.25	0.59
FWP1LS	70 (10.6)	102 (18)	170 (46.8)	0.69	0.41	0.60
FWP2HS	138 (23.4)	180 (55.6)	310 (39.4)	0.77	0.45	0.58
FWP2LS	89 (8.1)	150 (43.9)	216 (24.5)	0.59	0.41	0.69

Figure 4 describes the relative position of four groups of women with regard to four dimensions of uncertainties i.e. ecological, economic, institutional and social uncertainties. The severity of the degree of uncertainty was measured by an index from 0 to 100 within the horizontal and vertical axes, with those scores close to zero indicating the worst situations and those close to 100 indicating better situations when facing uncertainty. Most women in Semarang and Pekalongan faced critical situations when dealing with economic uncertainty (Figure 4). The first group of fisherwomen in Semarang even faced the most severe situation with a score close to zero. This group of fisherwomen who were wives of fishermen and who worked in fishing related activities received relatively low scores on all dimensions. The kite diagram showed in general that fisherwomen in Semarang faced higher degrees of uncertainties in all aspects, while those in Pekalongan, even though facing the same problems, were relatively less prone to the impacts of the uncertainties.

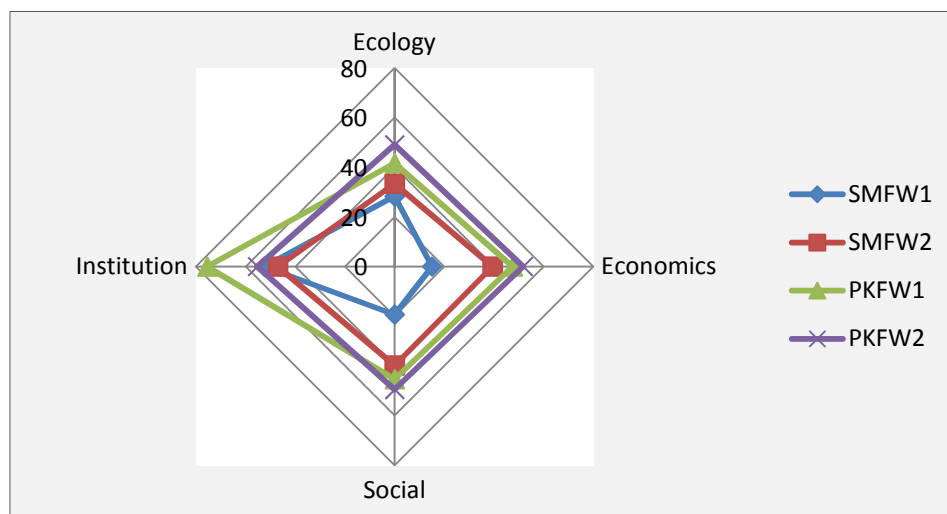


Fig 4. Kite diagram representing the relative position of uncertainties faced by fisherwomen. SMFW1 = FW1 group, Semarang; SMFW2 =FW2 group, Semarang; PKFW1 = FW1 group, Pekalongan; PKFW2 = FW2 group, Pekalongan.

To determine which variables were more sensitive to the uncertainty faced by fisherwomen, Rapfish's leveraging technique was used. For the ecological dimensions bar chart (Figure 5), the seasonal factor, pollution and drought were the attributes that mattered the most to the fisherwomen's livelihoods. And indeed, coastal communities at both sites were suffering from disturbances in ecological conditions and climate phenomena. For economic dimensions (Figure 5), both production volatility and volatility in women's own incomes were sensitive to the degree of uncertainties.

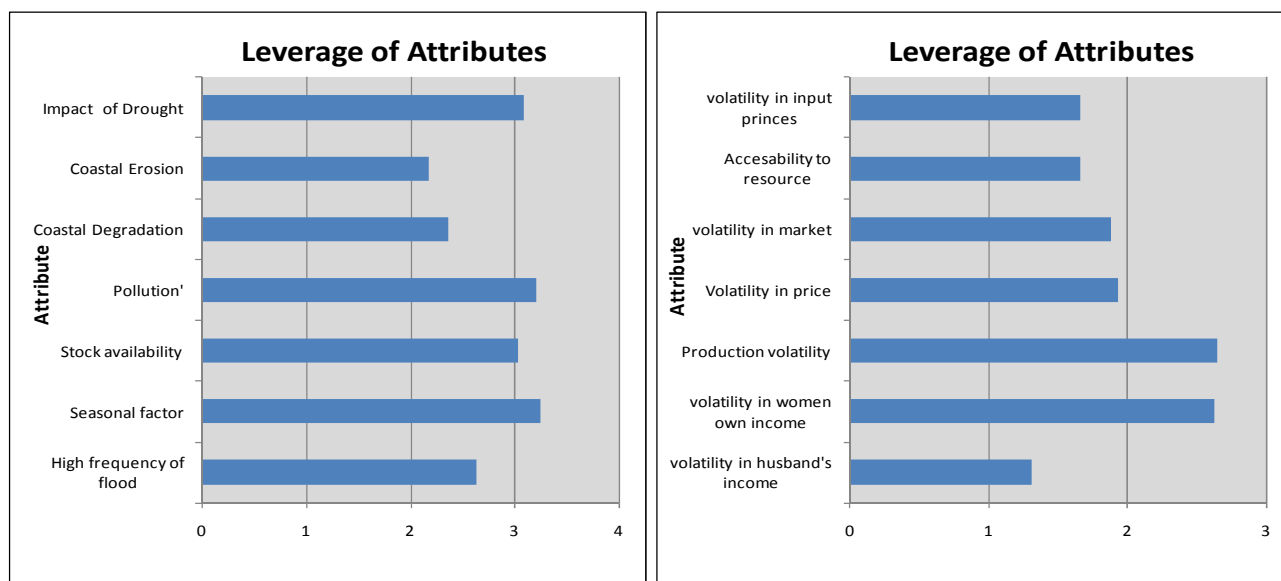


Fig. 5. Leverage of attributes for ecological (left hand chart) and economic (right hand chart) dimensions of uncertainty. For both charts, the bars represent the root mean square change in ordination when selected attribute is removed (on sustainability scale 0 to 100). The longer the bar, the more sensitive the variable is to uncertainty.

On social attributes, both family instability and unemployment are sensitive to the degree of uncertainty (Figure 6). This result agrees with the results from Berman (1981) who found that family instability jeopardised livelihoods of women. This result is not surprising given the high divorce rate on the north coast Java. The level of unemployment is also a determinant variable. High levels of unemployment could lead to a high degree in social uncertainty which could lead to livelihood disruption. With respect to institutional aspects, dependency on local financiers as well as local banking were both sensitive to the degree of uncertainty (Figure 6). This result is in line with that Acheson (1981) who found that fishers and their families establish many different kind of ties with middlemen to spread the risk. Women often deal with the financial issues. On the north coast, local financiers such as middlemen provide easy loans to coastal community households, including groups of women, but their interest rates are high. Women's groups can become very dependent but disrupting such relationships can lead to economic hardship.

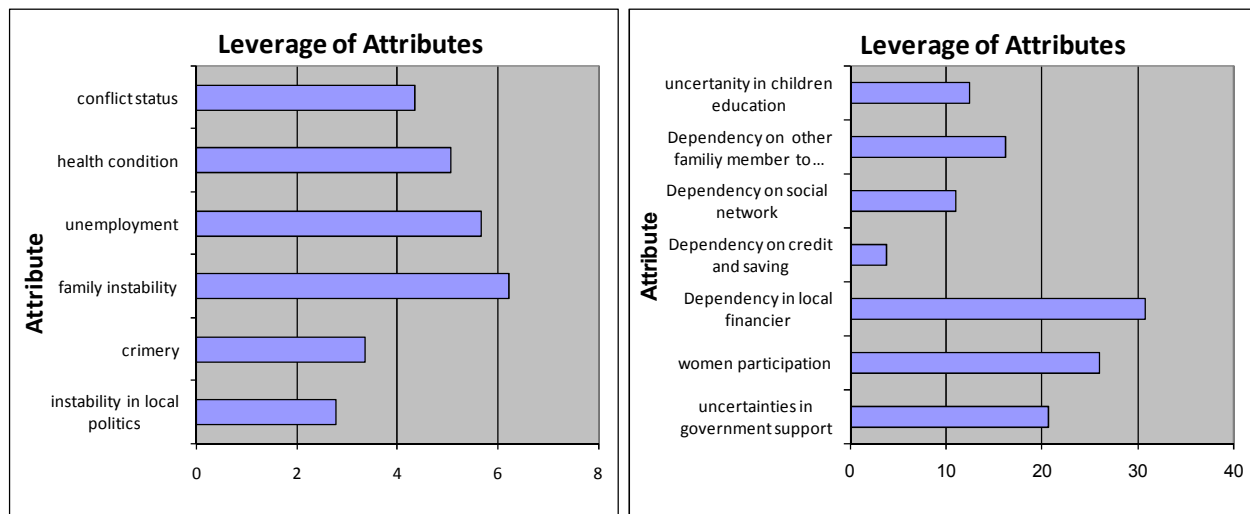


Fig 6. Leverage of attributes for social and institutional dimension of uncertainties.

Women's strategies to cope with uncertainties

Results showed that among the four groups of fisherwomen, the two most vulnerable groups were those who directly engaged in fishing activities by helping their husband to support the family's livelihood – the FW1 groups. Thus, these two groups merit further attention when examining coping strategies. In general, they tend to exercise two basic strategies. First is the strategy to deal with their internal family livelihood issues, and second is the strategy to deal with external forces. Within the family, women often act as “finance ministers” to organise the sustainability of the family's livelihood.

Women charged with the responsibility of managing the household finances have to smooth out financial ups and downs in the household due to fluctuation in fish production and other uncertainties. In order to do this, about 84% of the respondents in the two FW1 groups invested in community saving groups known as *arisan*. In this system, each woman contributes a certain amount of money which has been agreed by the group, normally between Rp 10,000 to Rp 25,000 (between US\$1 and US\$2.5) per rotation. If a group has 10 women members, then, in one period of *arisan*, the group has 10 rotations. Each week or month they meet to pick the winner of the *arisan*. The winner is chosen by random selection or by agreement and no interest is usually charged. The winner receives the total amount of money collected by the group. So if each contributes Rp 10,000, then the winner will receive a total amount of Rp 100,000 (US\$10). This strategy is usually preferred to gambling with a low probability of winning. Here the probability of winning is not only high, but the randomly selected winner can bargain also with those who desperately need the money to trade the turn. This kind of strategy has been described by Hanson et al. (2003). Diamond et al. (1997) also noted that fisherwomen in Indonesia are often engaged in community savings and credit associations or *arisan* which help them through financial uncertainties. With *arisan* they hedge the uncertainties by risk pooling with other fisherwomen. Through it and other actions, fisherwomen in Indonesia's coastal area are not only actively involved in producing fish but also play a primary role in overseeing household finances.

Some FW1 women (66% from respondents) also developed strategies to deal with shortages in household goods and basic necessities. They developed their own "credit system" to deal with sudden and unexpected needs. They either obtained household goods by leasing or paying by installments. Under rare circumstances, they also went to pawn shops in order to obtain cash to buy basic needs.

Several women (28% of FW1 respondents) worked more than the 8 hrs normal work in order to cope with low incomes during the low fishing season. They worked as part time housemaids for families of higher income groups within the coastal area. As part time housemaids, they usually worked from 07:00 hrs to 17:00 hrs. This work helped to cover daily necessities and reduced the budget for food for the family. Women who worked as maids received extra food for themselves and for their family members. Some families sent their daughters and other family members to work as professional housemaids overseas, e.g., in Malaysia, Singapore, Hong Kong and Taiwan. Those who worked abroad often sent their wages home to help their families ease their hardships. Thus, to deal with uncertainty, the labor of family members is maximised and pooled throughout the family, including children who sometimes work to help their parents.

Other strategies are to be thrifty and spend less on living expenses. During the low fishing season, women tend to reduce their spending on clothing and leisure. Similarly, they spend less on food by eating less frequently or change the composition of foods in order to save money. This

strategy, however, has resulted in a relatively higher number of malnourished children in these coastal areas compared to other areas.

With regard to external forces such as uncertainty in the husband's productivity, family instability and poor government assistance, fisherwomen develop several coping strategies. One was to sell certain types of longer lasting fish products. They tended to be the dominant sellers of by-products of fish and of small shrimps destined to be processed as *terasi* (fermented shrimp), often acting as oligopolistic sellers of these products. Since these are processed products, they last longer and can be sold over longer period of time than fresh fish. This form of selling was often used when their husbands could not go fishing due to bad weather or the low season.

Another coping activity was to form a group and invest to open up a kiosk business known as *kedai pesisir* or coastal café. Through the *kedai pesisir*, members could buy daily necessities at a cheaper price. They could also borrow goods with zero interest rate based on membership and trust among members. The cafés also serve as cushions when their husbands return back home with empty pocket.

These findings also echo some of those of Williams (1996), who noted that women were very mobile and adaptable, including to market and seasonal uncertainties. Women in coastal communities move from one job to another, changing commodities they trade or varying their activities according to the season as survival strategies in order to maintain the livelihood of the family.

To help avoid family instability, divorce was avoided as far as possible. Nevertheless when break ups occurred, women tried to adapt and not to take the divorce seriously. "Life goes on" was a common phrase used by the fisherwomen of the north coast of Java. Some found another partner and remarried and thus the remarriage rate was also high. Based on statistical data (Semarang Religious Agency, 2009), the number of divorces in Semarang was 1,900 yr⁻¹, while in Pekalongan the average was 1,500 yr⁻¹ (Pekalongan Religious Agency, 2009). This was slightly higher than the average of the other cities in Central Java, which was under 1,000 yr⁻¹ city⁻¹.

Conclusions

The present study has shown that fisherwomen of the north Java coast of Indonesia play essential roles in the economic chain fish chain through facilitating the fisheries activities of their husbands and through distributing fisheries products within the communities and the market. In addition, this form of employment can also play a significant role in acting as a buffer against insecurity and risk faced by other fishers whose position in competitive markets for fishery products and a changing environment is at the weakest point. Fisherwomen play a greater role in the coastal economy than just their role in fisheries. Ignoring their contributions would mislead our understanding about the dynamics of economic and social issues of the coastal communities.

Uncertainties have exacerbated the poverty in coastal communities. By empowering fisherwomen, poverty could be addressed in a more comprehensive manner. Empowerment programs which directly address women issues in coastal areas and target the right groups could benefit not only those within the women's groups but also the coastal community as a whole because of the women's pivotal role. In developing countries such as Indonesia, most government programs target fishermen's groups by giving them direct subsidies and other economic programs such as PEMP (Economic Program of Coastal Empowerment) but these often end in failure due to mismanagement at local levels. Direct subsidies given to fishermen are often misused and misallocated, and economic empowerment programs for fishermen often end up wasting money due to ineffective delivering programs. Yet little attention has been paid by fisheries authorities to the potential resource of fisherwomen as leverage for economic development at the local level. Future programs in fisheries development must include women as integral actors in economic development in coastal areas. The present study has demonstrated the utility of studies of uncertainty, leading me to conclude that development programs should also take into account the uncertainty in fisheries from the women's point of view. Women especially face uncertainties in their livelihoods reliant on fisheries economic activities. Governments should pay attention to the dynamic of all dimensions of uncertainties, especially for groups of fisherwomen communities who suffer the most, directly and indirectly, from uncertainties in fishing and the changing environment and climate. To make their policies more efficient and successful, the government should also pay attention to the critical dimension of uncertainty that lead to vulnerability of livelihoods in coastal communities.

Acknowledgments

The author wish to acknowledge the Ministry of Research and Technology of the Republic of Indonesia for providing support opportunities to conduct research on "Identification of Coastal Vulnerability Due to Climate Change Impacts" on the north coast of Java.

References

- Acheson, James M. 1981. Anthropology of fishing. *Annual Review of Anthropology*. 10:275-316.
- Alder, J. 2001. A method for evaluating marine protected area management. *Coastal Management* 30:1-131.
- Amirullah, A. 2003. The role of women in food security strategy: case study of fishermen household in Kuri Village, Maros Regency (In Bahasa). Research Institution of Hasanudin University. 78 pp.
- Berman, Y. 1982. Economic uncertainty and family instability. *Social Indicators Research* 11:99-104.
- Diamond, N., S. Mahfud, and R. Kinseng. 1997. Proyek Pesisir (coastal project) gender assessment. CRC/URI CRMP, Jakarta, 98 pp.
- Diposaptono, Subandono, A. Fauzi, Z. Anna, M. Helmi, and D. Nugroho. 2009. Identification of coastal vulnerability due to climate change in Indonesia (In Bahasa). Report to the Minister of Science and Technology, Republic of Indonesia. pp. 81-84.

- Fauzi, Akhmad, and Z. Anna. 2010. Social resilience and uncertainties: the case of small-scale fishing households in the north coast of Central Java. *MAST* 9:55-64.
- Ministry of Fisheries and Marine Affairs Republic of Indonesia. 2011. Indonesian Fisheries Statistics 2010. MMAF, Jakarta. 134 pp.
- Hanson, A.J., I. Agustine, C. Courtney, A. Fauzi, S. Gamage, and Koesoebiono. 2003. An assessment of the coastal resource management project in Indonesia. Coastal Resource Center, University of Rhode Island. Rhode Island. <http://www.crc.uri.edu>. 163 pp.
- Pitcher, T. J. 1999. Rapfish, A rapid appraisal technique for fisheries and its application to the Code of Conduct for Responsible Fisheries. FAO Fisheries Circular No. 947. FAO Rome. 47p.
- Pitcher, T. J., and D.B. Preikshot. 2001. Rapfish: A Rapid Appraisal Technique to Evaluate the Sustainability Status of Fisheries. *Fisheries Research* 49:255-270.
- Religious Court of Pekalongan Regency. 2009. Annual statistical Case Report. 64 pp.
- Religious Court of Semarang City. 2009. Annual statistical Case Report. 82 pp.
- Squires, D., I.H. Omar, Y. Jeon, J. Kirkley, K. Kuperan and I. Susilowati. 2003. Excess capacity and sustainable development in Java Sea Fisheries. *Environment and Development Economics* 8:105-127.
- Williams, S. 1996. Economic role of women in fishing communities: a case study of Koko, Nigeria. Technical Report 94. Department of International Development Cooperation of Denmark. Food and Agriculture Organization of the United Nations. 28 pp.