

**Managing the Risk of  
Short-Term Catch Fluctuations:  
A Case Study of the  
Kudawella Fishing Community in  
Southern Sri Lanka**

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***ABSTRACT.** This study aims at finding out the strategies adopted by fishermen to cope with short-term fluctuations of fishing incomes. Field studies were carried out in Kudawella, a fishing village in the Southern coastal belt of Sri Lanka. Information on income and expenditure were collected daily from a stratified random sample of 25 craft owners, the strata representing type of technology employed by fishermen to catch fish. Owners of traditional crafts represent the poorest among all fishermen who earn incomes below their subsistence requirements, while those who operate large mechanised crafts earn incomes well over their subsistence needs. Engagement in diverse activities and adoption of mechanised fishing are two important precautionary strategies adopted by fishermen to manage risks of short-term fluctuations of fish catches. Moreover, fishermen do not confront covariant catches and this paves the way for the operation of reciprocal credit among fishermen. In the absence of any organised market providing insurance for the risk of falling into distress, community sources of credit form a very important insurance strategy that can be adopted to manage short-term income fluctuations.*

**INTRODUCTION**

Risk and uncertainties are related to different degrees of lack of knowledge about the state of nature. With regard to fishermen in the South of Sri Lanka it would be hard for them to calculate the odds of an event such as the appearance of fish shoals, sudden variations in weather, variation in catch within a day, etc. Therefore, it seems that they are operating in an environment of uncertainty.

The unpredictable nature of catches give rise to serious problems in securing daily subsistence needs of fishermen. A fisherman may confront zero catches continuously for a few days while his subsistence needs and operational capital needs remain constant. Since incomes are earned in small daily instalments, planning is difficult in fisheries. Therefore, it would be useful to find out how fishermen cope with short-term income fluctuations that may threaten their subsistence. This call for adoption of strategies that can cope with short-term fishing related risks.

People living in precarious environments often develop sophisticated institutions and strategies to reduce or cope with fluctuations in food entitlement and these strategies of risk management fall under three categories; i. precautionary strategies; ii. insurance strategies; and, iii. adjustment strategies (Dreze and Sen, 1986). Precautionary strategies, which are also termed "self insurance" strategies, include accumulation of assets (such as grain in storage, livestock, gold, cash *etc.*) as well as activity diversification. Insurance strategies are those adopted to pool, shift or share risks within wider social entities {common examples are reciprocal exchange, sharing with extended kinship network, share-cropping, credit and patronage (Binswanger and Rosenzweig, 1986)}. Steps can also be taken to contain damage caused by income fluctuation and these are called "adjustment strategies" (which include reduction of activity, foraging, raiding and migration (Wanasinghe, 1991).

The objective of the present study is to find out how fishermen in the south of Sri Lanka manage the risks of short-term catch fluctuations which give rise to fluctuations in food entitlement.

## MATERIALS AND METHODS

The present study was carried out in Kudawella, a fishing village in the south of Sri Lanka. Information on income and expenditure were obtained daily from a sample of craft owner families over a period of two months in order to find out the sources and patterns of income and expenditure and, also to understand various strategies adopted by fishermen to cope with short-term fluctuations in incomes. A stratified random sample of 25 craft owners was selected in which the strata represented fishermen operating different crafts (therefore different technology). Each strata consisted of five craft owners who were randomly selected from the list of registered craft owners. The types of crafts considered were, i. non-mechanised traditional crafts (NMTC); ii. mechanised traditional crafts (MTC); iii. 17-23 feet fibre glass boats with outboard engines (FRP); iv. 28-32 feet one-day operating crafts with inboard

engines (ODOC); and v. 32-34 feet multi-day operating crafts with inboard engines (MDOC). Since data related to daily income and expenditure had to be collected the sample size had to be kept small. Field studies were carried out during the months of August and September 1995 which coincide with the 'fishing season' in the South of Sri Lanka. Data were collected by administering a pre-tested structured schedule to the sample fishermen daily, which aimed at eliciting information on daily income and expenditure pattern of fishermen during the two month study period.

The analysis is carried out in three steps. First, a comparison is made between average daily incomes and expenditure of craft owner families to find out the size and pattern of expenditure and income. Second, a comparison of weekly fishing incomes with weekly subsistence needs (level of income required to meet subsistence needs) is made to find out how often fishermen adopting different technology fall into crises of subsistence and how they manage such crises. For this analysis, the level of subsistence was assumed to be the total average weekly expenditure incurred during the study period by the owners of non-mechanized traditional crafts, who appear to be the poorest among craft owners (assuming that they operate at the level of subsistence). This assumption is not unrealistic considering the fact that these owners lead a very frugal life, as evident from their living styles. Finally, measures adopted by fishermen to manage short term fluctuations of incomes will be identified from income and expenditure data and the importance of such measures across different strata will be discussed.

## RESULTS AND DISCUSSION

### Income and expenditure pattern of craft owners

Average daily income and average daily expenditure of different types of craft owners during the study period are given in Table 1. Although average daily expenditure depend on the family size, the influence of the latter variable on family expenditure across the sample was considered to be minimum because the family size of the total sample varied between 4 to 6. The highest average daily fishing income and average daily expenditure are reported by owners of MDOC, while owners of NMTC reported the lowest. All fishermen receive income both from fishing and non-fishing sources, revealing that fishermen, in general, adopt strategies of activity diversification (or self-insurance) in order to manage short-term catch fluctuations. Fishing incomes tend to increase while the ratio of non-fishing income to total income tend to decrease, with increasing degree of mechanisation of crafts. In fact, fishing

**Table 1. Average daily income and average daily expenditure (Rs) of craft owner by type of technique.**

Type of Technique	1	2	3	4	4/1*100	4/2*100	4/3*100
NMTC	138.6	252.4	187.4	122.6	88.45	48.57	65.42
MTC	203.1	364.8	290.0	161.5	79.50	44.27	55.68
FRP	280.5	553.7	343.9	176.6	62.75	31.90	51.35
ODOC	692.0	769.6	419.6	199.7	28.86	25.95	47.60
MDOC	1635.0	1950.0	665.0	207.0	12.66	10.61	31.12

1 - Average daily fishing income (Rs).

2 - Average daily total income (Rs).

3 - Average daily expenditure (Rs).

4 - Average daily expenditure on food (Rs).

4/1\*100 - Percentage of daily expenditure on food from fishing income.

4/2\*100 - Percentage of daily expenditure on food from total income.

4/3\*100 - Percentage of daily expenditure on food from daily expenditure.

incomes of owners of traditional crafts are hardly adequate to meet the household needs; and such balance needs have been met by supplementary incomes earned from other activities such as rope making, fish drying, fish marketing, labouring, *etc.* In respect of owners of large mechanised crafts (ODOC and MDOC), it is evident that the average daily income they receive from fishing activities remain above their average daily expenditure indicating that these craft owners are less likely to fall into crises of subsistence even if they solely depend on fisheries for their livelihood. The owners of NMTC appear to spend a very high proportion of income on food (88.45%) than the owners of more sophisticated crafts indicating the general poverty of people who are engaged in traditional fisheries. It is evident from Table 1 that fishing incomes earned by the owners of NMTC are just sufficient to meet their daily food needs. The level of subsistence which was worked out to be Rs. 1,309 per week (Rs. 187.40 per day) was then compared with fishing incomes earned by craft owners. Income below the level of subsistence indicates risk of falling into distress, meaning that fishermen earn incomes below their subsistence needs. It is evident from Figure 1 that fishing activities of NMTC bring in a return which is always below the level of subsistence. Risk of falling into distress still remains high with those fishermen operating MTC and, to a lesser

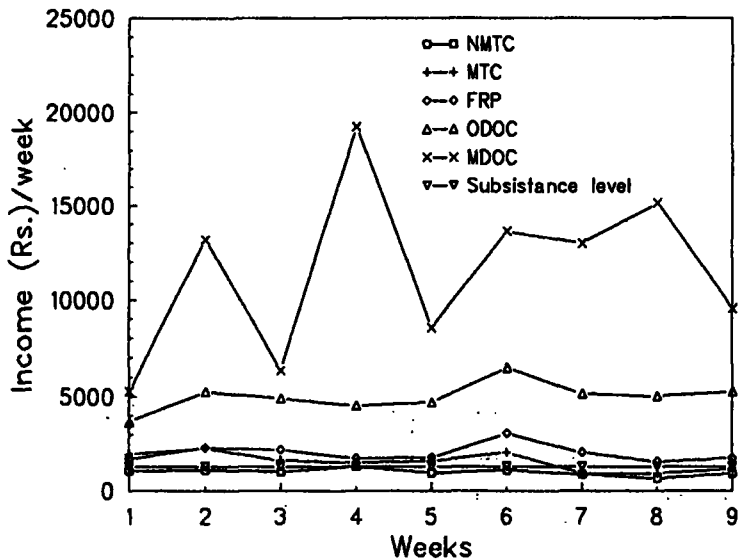
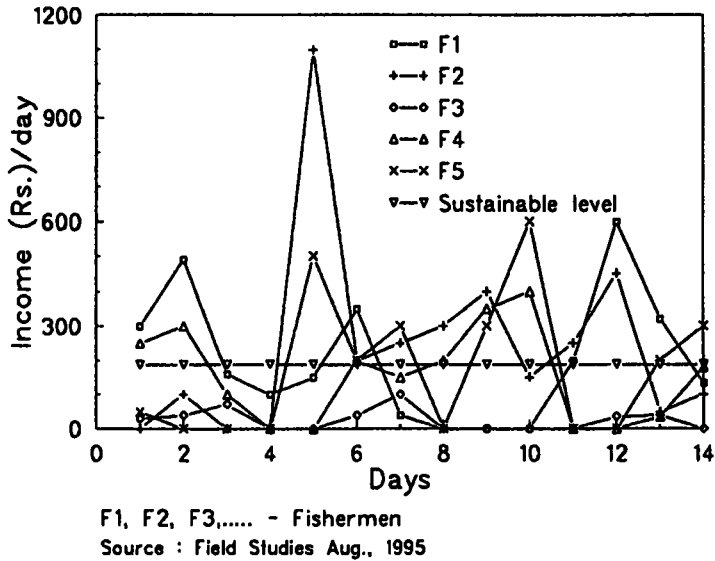


Figure 1. Average weekly fishing income of craft owners.

extent, those operating FRP. Therefore, most of the owners of these crafts are forced to engage in other income generating activities (activity diversification). Information provided in Table 1 indicate that the ratio of non-fishing income to total income of owners of MTC and FRP is higher than that of other types of craft owners.

It is also evident that amplitude of fluctuation of average weekly incomes of owners of large mechanised crafts (MDOC for example) is fairly high but, these craft owners hardly face risk of falling into crises of subsistence because, even when fishing remains at a very low ebb, they are able to earn incomes well above the level of subsistence. The large mechanised crafts are equipped with a wide range of gear which can exploit different fish resources. Moreover, they are able to engage in multi-day fishing trips when fishing is 'poor' due to the presence of sleeping and cooking facilities in the cabin and the presence of a 'cold room' for fish preservation. The value of even a 'poor catch' often exceeds that of family subsistence needs of the craft owner. Therefore, they are less in need of earning supplementary incomes and, this is evident from Table 1 where the ratio of non-fishing income to total income of these craft owners is comparatively low. In fact, these craft owners generally do not engage in other occupations and non-fishing incomes reported by them mainly represent those earned by members of their families.



**Figure 2.** Daily income of NMTC craft owners.

### Income fluctuations and coping strategies among fishermen

Unlike agriculturists who often confront covariant yields (yields of all farmers within a particular geographical location rise and fall at the same time), the fishermen do not confront covariant catches. Two fishermen carrying same equipment and operating within a particular resource area often confronted with different catches. This phenomenon is well evident from information provided in Figure 2, where daily fishing income of five owners of traditional crafts are given for a two week period. Note also the fact that fishermen often confront zero incomes. It is well evident in Figure 2 that all fishermen do not confront high incomes or zero incomes at all times and that one who receives a high income today is likely to earn nothing tomorrow. This is a very important fact that paves the way for the emergence of reciprocal credit mechanisms in fishing societies (Platteau and Abraham, 1987; Amarasinghe, 1988). Reciprocal credit represent small short-term loans that are exchanged among fishermen in meeting shortfalls in daily consumption requirements.

Table 2 gives the sources and amounts of credit obtained by all types of craft owners during the study period. Total credit represents both production and consumption credit. All loans obtained from banks (formal credit) during the study period represent investment expenditure (on craft and gear). It is

**Table 2. Source and amount of Credit obtained by Fishermen in Kudawella (August - September, 1995).**

Source of Credit	NMTC	MTC	FRP	ODOC	MDOC
Bank	5000	6000	65000	310000	280000
Parents	600	-	-	200	-
Friends	4700	4000	2400	46600	40000
Money Lender	4000	500	6500	10000	-
Boutique	-	1490	2300	500	-
<b>Total</b>	<b>14300</b>	<b>11990</b>	<b>77200</b>	<b>367300</b>	<b>320000</b>
% of formal credit	35.0	50.0	84.2	84.4	87.5
% of informal credit	65.0	50.0	15.8	15.6	12.5

- NMTC - Non Mechanized Traditional Crafts
- MTC - Mechanized Traditional Crafts
- FRP - Fibre glass 17-23 1/2' boats
- ODOC - One Day Operating Crafts
- MDOC - Multi-Day Operating Crafts

Source: Field studies, Aug-Sept. in 1995

evident that community sources of credit such as parents, friends, money lender and retail shops are fairly important to those adopting traditional techniques of fishing. Most of these loans represent loans aimed at meeting shortfalls in consumption. It is important to note that fellow fishermen (friends) form a very important source of credit indicating the operation of reciprocal credit among fishermen. One who is 'lucky' to get a higher catch can lend part of his earnings to a needy 'unlucky' one, and in a fishing society everybody knows that he cannot be either lucky or unlucky everyday. What is interesting in a system of reciprocal (consumption) credit is that it really functions like an insurance market and, thereby imparts to fishermen the advantage of maximum inter-temporal flexibility in adjusting their consumption. However, with increasing degree of mechanisation of craft, the risk of falling into distress is greatly reduced and reciprocal credit provided by the fishing community become less important.

## CONCLUSION

Irrespective of the type of techniques employed, all fishermen confront very high catch fluctuations which give rise to fluctuations in food entitlement. Those fishermen who are employing traditional techniques of fishing always receive incomes below their subsistence needs and often face crises of subsistence. Therefore, they are forced to adopt activity diversification strategies of risk management that bring in supplementary incomes. The need for activity diversification declines with increased adoption of mechanised fishing activities because fishermen who adopt mechanised fishing are less likely to receive incomes below their subsistence requirements. It is evident that both activity diversification and adoption of mechanised fishing present two important strategies available to fishermen to manage short term risks associated with fishing activities.

The fact that fishermen do not confront covariant catches give rise to the emergence of reciprocal credit mechanisms by which small loans are exchanged among fishermen giving them inter-temporal flexibility in adjusting to consumption needs. In general, community sources of credit represent an important source of insurance in the absence of any organised market providing insurance against the risk of falling into distress.

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