Witt, Rudolf; Pemsl, Diemuth E.; Waibel, Hermann

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Small-scale inland fisheries in Africa:

How to collect data for poverty assessment?

Rudolf Witt[1], Diemuth E. Pemsl[2] and Hermann Waibel[3]

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Abstract

Accurate poverty assessments in developing countries require efforts to collect detailed household level data. Especially in Africa, such procedures are time consuming, expensive and can be subject to numerous constraints.

In this paper we discuss the procedure of the collection of data on consumption, income and assets from poor households involved in small-scale inland fisheries as well as agricultural activities. A sampling scheme has been developed that captures the heterogeneity in ecological conditions and the seasonality of livelihood options. Sampling includes a three point panel survey of 300 households. The respondents belong to four different ethnic groups randomly chosen from three strata representing different ecological zones.

In the first part of the paper the methodological framework, the survey design and interview procedure adapted to the conditions in Northern Cameroon is discussed. The second part of the paper presents selected results of the baseline study on consumption, income and assets for different types of households. In addition the record of past ecological, economic and social shocks is presented.

[1],[3] Institute of Development and Agricultural Economics, Faculty of Economics and Management, Leibniz University Hannover, Königsworther Platz 1 30167 Hannover Germany; email:witt@ifgb.uni-hannover.de

[2]The WorldFish Centre, Penang, Malaysia

Introduction

Small-scale inland fisheries (SSF) are found in a wide diversity of ecosystems: lakes, rivers, reservoirs, ponds and wetlands (DFID 2002). In Africa, in some areas, SSF often face a lack of infrastructure such as roads and communication facilities. Many systems vary in size with the seasons and from year to year, influencing the livelihoods of their users, who have to constantly adapt to the changing resource status by shifting their activity portfolio. Also, differences exist in the gradient of fishing related activities, from occasional (often just seasonal) fishing, to fulltime or part-time all year long fishing. Generally, small-scale fishing is mainly targeted on supplying fish to local markets, and subsistence consumption.

Inland fisheries in Sub-Saharan Africa are part of a flexible and strongly seasonal matrix of various and diversified activities (Béné et al. 2003a, 2003b, 2003c, Neiland et al. 2000, 2005, Sarch 1997). “During the same season, the local populations are alternatively or simultaneously fishers, herders, and farmers, and each piece of land is potentially a fishing ground, a grazing area and a cultured field, depending on the period in the flood cycle.” (Béné et al. 2003a, p.20). Due to the high vulnerability of the ecological and economic system to shocks, such as flood, drought and pest outbreaks which result in year to year variation in fish stocks and in sometimes high crop losses, households have diversified their activities portfolio, thus spreading the risk of income losses.

Since inland fish resources in Africa are a common property natural resource under a quasi-open access regime, for many households fishing is an important activity during a short period in the year. Fish not only provides needed proteins, but can also generate a considerable share of total household income. This income source may function as a safety net and thus decreases vulnerability to poverty. Especially fish processing (cleaning, smoking and drying), which is almost exclusively performed by women, can contribute to stabilize income in the face of shocks.

A common opinion in the past was that fishers belong to the poorest of the poor (Bailey et al. 1986, Smith 1979 and 1981, World Bank 1982, Cunningham 1993, Townsley 1998, Payne 2000). Fishing as a livelihood activity was perceived to be the cause of the low living standard of many households, due to its high risk nature. This understanding has been repeatedly challenged in the past by a number of empirical studies, which found that fishers

actually performed better in terms of income generation and general well-being than non-fishers (Allison 2005, Mkenda 2000, Tietze et al. 2000). However, although it is assumed that small-scale fisheries can generate significant profits and make significant contributions to poverty alleviation and food security, little information exists about their actual contribution to livelihoods and household economics in Africa (FAO 2005, 2006). There is a lack of quantitative data and pertinent research. Better estimates of the fundamental mechanisms affecting the livelihood dynamics of this sub-sector are needed. The identification of the true sources of poverty and vulnerability, as well as of the existing (and missing) coping options in small-scale fisheries, is required in order to develop effective poverty reduction policies.

This endeavor is challenging, as patterns and constraints of resource use vary considerably (spatially, seasonally and over time) which makes high demands on the type of data required to evaluate the role of fisheries. For the assessment of the contribution of SSF to households' well-being, an accurate survey methodology is needed, accounting for the seasonal nature of SSF, and the dynamic interplay of different livelihood elements. This paper presents the procedure of the collection of data on consumption, income and assets from poor households in the Logone floodplain, a major inland fisheries region in Northern Cameroon. This case study is conducted within the framework of a BMZ-funded WorldFish Center project, aiming to sustain and improve the livelihoods of the rural poor who depend on fisheries for their employment, income and food security along the rivers of the Lake Chad and Zambezi River Basins. The collection of household level panel data was carried out with the objective to assess the contribution of SSF to reducing vulnerability to poverty.

Theoretical background

Vulnerability, as commonly defined, is the exposure of a household to certain risks, and it's ability to cope with them, or the strength of ex-post and ex-ante insurance mechanisms against these risks (Duclos 2002, Klasen 2005). It is a dynamic assessment of poverty, taking into account the variation in well-being over time due to some unexpected negative events, shocks, affecting the productive asset base, income or consumption of a household. Vulnerability measures usually indicate the probability of a household to fall below a predefined poverty line in the future.

Diversification is one of the ex-ante coping strategies, as has been shown by a number of studies (Valdivia et al. 1996, Block and Webb 2001, Little et al. 2001). In case of crop losses through pests, for example, consumption can be smoothed through intensifying fishing efforts, in addition to sales of livestock or engaging in other activities. The safety net function of small-scale fisheries is particularly important in the study area, where non-farm activities are extremely limited. However, given a constraint in the household labor force, the decision on the activities portfolio entails the need to balance specialization and diversification. An increasing share of income from fishing in the total household income indicates a higher specialization in fishing at the expense of other activities. Analyzing the profitability of different income generating activities as well as the variability of returns, across the sample and over time, would answer the question to what degree fishing can increase average household income without increasing vulnerability.

A methodological framework for the assessment of household vulnerability to poverty is being developed, which will give a clearer picture of the seasonality, the livelihood dynamics and stochastic poverty in the sampled communities. In this paper, we put emphasis on the requirements of the general methodological approach for survey design and sampling. Due to the complex nature of the SSF sector outlined above, an adjusted procedure for sampling and data collection is required in order to be able to address the most crucial questions related to the impact of SFF on poverty and vulnerability. Particularly, the sampling and survey design needs to consider the variation in the fishing dependency ratio of sampled households, also accounting for different livelihood elements of the population, such as (1) activity portfolio, (2) variation in access to resources and production possibilities, and the resultant (3) seasonal fluctuations in consumption, income and assets.

Survey design

The study site is the Logone floodplain in the Far-North province of Cameroon. This area is characterized by an annual flood cycle due to the overflow of the Logone River and temporary flows of the rivers of the nearby Mandara Mountains. The floodplain covers about 8,000 km^2 and is part of the bigger Logone-Chari sub system in the Lake Chad Basin, which supplies 95% of Lake Chad's total riverine inputs and has a basin area of approximately 650,000 km^2 (UNEP 2004). Within this vast area a representative region was defined in

collaboration with national experts and other informants, also considering the accessibility and logistic feasibility of the study. The study area covers about 2,400 km^2, spreading from the Maga Lake in the south to the village of Ivyé in the north, where the Logomatya joins the Logone River. This area is relatively densely populated and is characterized by a rich fish stock and intensive fishing, fish processing and fish trade activities at the northern shore of the Maga Lake, the Logone River and its tributaries: the Logomatya and the Lorôme Mazra.

As sampling procedure a stratified random sampling was chosen. Given the need to receive a representative sample of households in the study area with different production conditions (such as access to fish resources), the sampling design envisioned a stratification of the study site into different zones. It was hypothesized that under different ecological and production conditions the role of fisheries in terms of income generation is likely to differ. This procedure allowed capturing the whole continuum of fishing intensity (from wholly specialized fishermen to purely agriculture/livestock rearing oriented households). Hence, based on the criterion of access to fish resources, three zones have been identified in the Logone floodplain (see Figure 1): the Lake Maga area (zone 1), the Logone and its tributaries (zone 2), and the arid, only short-term flooded area (zone 3).
Zone 1 is characterized by an almost all year long possibility to fish in the Maga Lake and the Logone. Fishing in zone 2 is possible during about 5 months (from September to January, but the time period changes from year to year), while in zone 3 there is a very limited access to fish resources during the flooding period and in temporary ponds (in the months of October to November).

In a second step, a complete list of villages in the study area (N=88) was compiled, based on information from different sources (detailed map of the study area provided by World Forest Watch, and a number of maps from previous studies in the area, provided by MINEPIA). These villages served as the primary sampling unit. In order to meet the requirements of econometric analysis a sample size of 300 households was assumed to be sufficient. This represents about 7% of the population in the study area (an estimated 20,000 inhabitants).

Several discussions with experts resulted in the decision to choose 14 villages and then randomly select about 22 households per village on average (the average village size in the floodplain is about 45 households, but ranges from 15 to 100 households). The villages were selected by weighted random sampling, proportional to the total number of villages per zone

(zone 1: 9 villages; zone 2: 59 villages; zone 3: 20 villages), which led to the choice of two villages in zone 1, nine villages in zone 2 and three villages in zone 3 (see Figure 1). Three out of the 14 villages had to be replaced after consulting local key informants. This has become necessary due to a civil unrest that took place shortly before the start of the study, which had left a number of villages uninhabited. In order to assure the sample being representative, villages of similar size and geographical location were selected in the same zone.

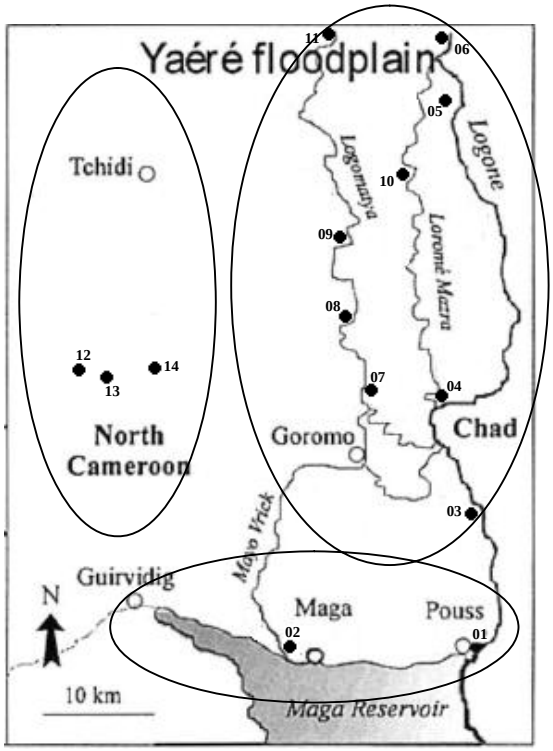

Figure 1: Map of the study area, the zones, and the 14 villages selected for the study

Source: adapted from Béné et al. 2003a

All selected villages were visited before commencing the HH level survey with the aim to conduct focus group discussions (FGDs) with the village (or quartier) leaders. The objective of the FGDs was twofold. First, some general qualitative information needed to be collected on village size, infrastructural facilities, remoteness to fish resources, markets and the like. Second, complete household lists for every selected village had to be compiled, since no such information existed. For this study, a household was defined as an 'economically independent unit consisting of the household head, spouse(s), children and other directly dependent members, living with the household or elsewhere'. The household size varies depending on the age of the household head, from two (husband and spouse) to more than 15 (northern

Cameroon is dominated by the Islamic culture of polygamy, hence household heads often live together with up to four wives). Mostly, households do not live separately from other kin households, but usually form a clan, living together in a larger compound (nevertheless being economically independent from other families).

During the visits special attention was paid to list the names of individual household heads and not only the compound/clan leaders. The additional information collected during the FGDs was necessary to get a first understanding of the livelihood options and constraints in the study area, which proved to be helpful for the development of the household questionnaire. In the last step, the compiled household lists were used for a weighted random sampling of the 300 sample households.

Methodology of data collection

Seasonality is an important characteristic of the livelihood conditions in the Logone floodplain. Therefore, in order to capture seasonal variations, the survey was designed to yield a two-period panel data set (2006 – 2007), with an additional survey six months after conducting the baseline survey (see Figure 2). Hence, the baseline survey was conducted right at the end of the dry season, when income generating activities are extremely limited, and the financial resources, generated during the rainy season in 2006, are being used up. The period covered in the baseline survey was basically the past year (May 2006 – May 2007), constituting a stock check of average income flows, consumption expenditures, and an asset inventory taking. The first follow-up survey then captured the busy time of the year, where expenditures rise due to investments (e.g. purchase of new fishing nets and other productive assets), and variable production costs in agriculture and fishing. Finally, the second follow-up will cover the second half of the survey year, giving account of the economic household activities in this period. This approach is supposed to improve the accuracy of data on livelihood activities, and to make sure to capture seasonal variation in income and consumption.

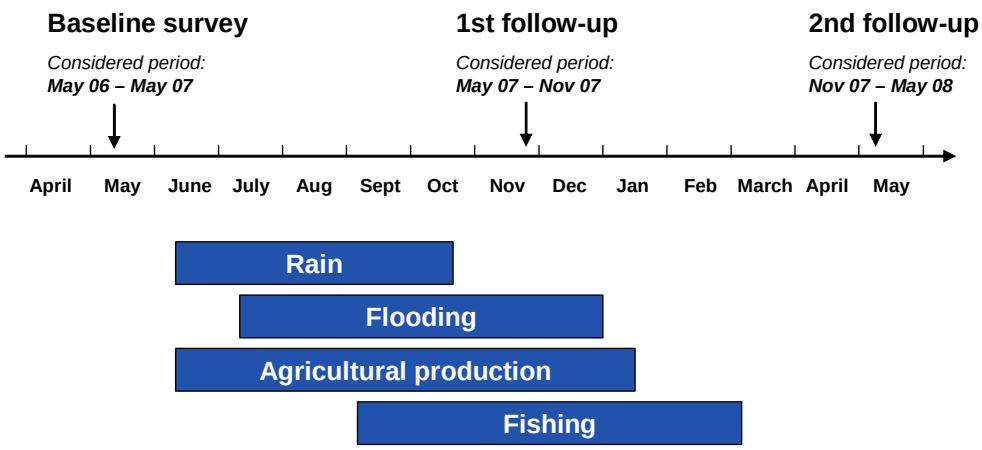

Figure 2: Livelihood options in the study area and design of the survey

Source: own illustration

The baseline questionnaire covered different aspects of the livelihoods, especially aiming at collecting information on household economics. The questionnaire was divided into four sections: (1) household composition, shocks and health, (2) production data, including agriculture, fisheries, livestock and non-farm work, (3) housing, productive and convertible assets, and (4) food and non-food expenditures (see Table 1).

The occurrence of shocks was recorded for the last ten years, which is intended to be used for the assessment of vulnerability to poverty of the sampled households. The rationale for a longer period in the shock section is that people are likely to remember such outstanding events for a longer period, and also because severe shocks (e.g. death or extreme climatic events) might not occur as frequently, thus running the risk to not capture the full range of possible shocks if only considering 1 or 2 years.

The questionnaire was produced in French, as four different languages are spoken in the study area (Mousgoum, Kotoko, Arab and Fulfuldé). Translation of the questionnaire into all the languages was considered to be not very cost-effective. Instead, four officers of the Ministry of Livestock, Fisheries and Animal Production (MINEPIA), who already work in the area for several years and speak all the languages, were recruited and trained during a one-week training workshop for the enumerators. The workshop was conducted in the regional capital Maroua, including two days of pre-testing and adaptation of the questionnaire. The pre-test was carried out in two villages of zone 1 and 2, in order to test the suitability of the questionnaire for different livelihood conditions.

Table 1: Structure and contents of the baseline household questionnaire

Section	Sub-section	Type of information
Household roster and shocks	List of HH members	Gender
		Relation to head
		Education
		Primary/secondary occupation
	Information on absent HH members	Gender
		Relation to head
		Education
		Duration of absence
		Reason of absence
	Illnesses	Type of illness
		Costs of illness
		Lost work days due to illness
	Shocks in the past 10 years	Type of 3 major shocks
		Estimated loss due to shock
		Coping activities
		Value of coping activities
Production	Agriculture	Production options (access to resources
	Fishing	e.g. land, fishing grounds)
	Fish trade	variable production costs
	Livestock	gross revenue
	Off-farm	self-consumption (crops, fish and livestock)
Assets	Housing	quality and estimated value
	Productive assets	inventory taking (number and value of items)
	Convertible/consumption assets	changes in the last year (sale / purchase)
	Debts/Receivables	inventory taking (liabilities and receivables)
	Savings	changes (repayment / indebtedness)
Expenditures	Non-food	education, hygiene, clothing etc.
	Food expenditures	food items
		consumption patterns (frequency of consumption)
		monthly expenditures
		number of proper meals per day
		days of hunger

Source: own compilation

Experiences during the pre-test showed that interviewees tended to hide certain information (e.g. expenditures on certain consumption goods, or income figures), or refused to answer some questions, if other household members or people external to the household were present at the interview. It was therefore decided to interview just one or two household members (usually the household head) in order to establish a private atmosphere during interviews and to encourage the respondent to honestly answer the questions. If the household head was not

present, the spouse (if so allowed) or another adult member of the household was interviewed. Very few replacements of originally sampled HH had to be made during the survey, due to absence, unwillingness or for other reasons. All in all, only five households were replaced, usually picking another household from the same compound. The possible errors introduced by this procedure (instead of choosing households from a randomly drawn replacement list) may be considered as negligible due to the small number of households replaced.

The baseline study was carried out within 3 weeks (23.4 – 14.5.2007) by four enumerators, working in a team, and accompanied and directly supervised by the researcher. This procedure gave the opportunity for immediate cross-checking for missing information, and also enabled the researcher to directly check on interview techniques and immediately discuss problems or questions.

The survey procedure was as follows: The whole team arrived in a village, presenting itself to the village chief, who already was informed about the arrival of the team during the FGD-visit. The chief then called the heads of the selected households to come to a central meeting place, usually under a tree in front of the chief's house. Due to some peculiarities of the Muslim culture in northern Cameroon, respondents were not willing to receive the respective enumerator in the house, but instead preferred to be interviewed at a central meeting place. Hence, the enumerators sat down at a distance of about 5 meters from each other so as to be able to talk to the respondent in private. After the interview, which took about one hour on average, the respondent was given a small present as a compensation for his time (a package of sugar and a bag of tea), and the next household head was called to sit down.

Working in a group enabled the team to finish a village in about a day and continue to the next one. For security and psychological reasons that course of action strongly motivated and encouraged them. However, logistical and time constraints have had a negative impact on the quality of data, since the enumerators were inclined to finish the questionnaires quickly, filling in the answers as they were given by the respondents, not having the leisure to verify the consistency and logic of the information.

This fact was one of the lessons learned from the baseline survey, which have been considered in planning and implementing of the follow-up surveys in December 2007 and May 2008. During the retraining workshop before the start of the first follow-up survey, special emphasis

was put on the ultimate primacy of data quality. The interview time, and hence the time planned to be spent per village, was held flexible, so that careful cross-checking for consistency and reasonability of responses was ensured.

The follow-up questionnaire entailed more detailed questions on production decisions, covering a six-month period each, in order to detect seasonal patterns of expenditures, income and thus (transitory) poverty. The data entry and cleaning of the first follow-up survey is still in process.

Initial descriptive results

The initial analysis of baseline data confirmed the hypothesis that differences in access to fish and other resources result in different livelihood strategies. All in all, five livelihood activities were identified in the study area, namely agriculture, livestock rearing, fishing, fish trade and off-farm work (commerce, carpentry, herdsmen, etc.). Table 2 displays the proportion of households that are engaged in one of the mentioned activities, as well as the diversification index, calculated as the average number of activities per household. The results are given per zone, showing the variation in specification / diversification strategies of households.

Table 2: Proportion of households engaged in livelihood activities and diversification index per zone

	Zone 1		Zone 2		Zone 3	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
HH engaged in fishing	0.58	0.50	0.86	0.35	0.05	0.22
HH engaged in fish trade	0.20	0.40	0.13	0.34	0.00	0.00
HH engaged in livestock rearing	0.95	0.23	0.95	0.23	0.95	0.22
HH engaged in agricultural production	0.91	0.29	0.98	0.15	0.88	0.32
HH with off-farm work	0.11	0.31	0.13	0.34	0.12	0.32
Diversification Index	2.75	0.80	3.05	0.61	2.00	0.60

Source: baseline data

Agriculture as well as livestock rearing are basic activities, taken up by 88 and more percent of interviewed households. While off-farm work is playing an equally minor role in all three zones, considerable differences exist concerning engagement in fishing activities. As expected, only 5 percent of households in zone 3 are fishing. In contrast, 86 percent are

dependent on fisheries in zone 2 (Logone river and tributaries). It is noteworthy that a high share of households in the first zone does not fish, despite all-year fishing possibilities in the Maga Lake and the Logone River, which may indicate a specialization on agriculture or livestock rearing.

An explanation of this portfolio decision is that the villages in zone 1 have access to a governmental rice-irrigation scheme, using the waters of the artificial Maga reservoir, which had been constructed for this purpose in 1979. Irrigated rice production allows up to two cropping seasons per year, unlike the rain fed rice and millet cultivation, prevalent in zones 2 and 3. The use of irrigated rice fields is costly, which is reflected in high rent costs for land and higher production costs in agriculture (see Table 3) (two cropping seasons, instead of one, costs for electric pumps etc.). Given these high investment costs and limited labor force, many farmers in zone 1 prefer to specialize in rice production, which results in a relatively low share of fishing households.

The different livelihood strategies in the three zones are also reflected in the average number of activities per household (Table 2). Other than in zone 1, the relatively risky production conditions in zone 2 have forced households to diversify their activity portfolio, so as to spread income risk. Households in zone 3, however, had to specialize in livestock rearing and agricultural production. Especially in this arid, and relatively sparsely populated, zone, crop yields are heavily under threat by large bird swarms, coming from the nearby Waza National Park, and invading the area every year. Hence, livestock is a major asset for farmers in zone 3 (see Table 3).

Interestingly, despite only 58 percent of fishing households in zone 1, compared to 86 in zone 2, households in zone 1 are receiving a much higher revenue from fishing. Again, farmers/fishers in zone 1 are privileged. At the northern shore of the Maga Lake a well-functioning fish market (mainly fresh fish) exists, mainly supplying the market in Maroua, the capital city of the Extreme-North province of Cameroon, at a distance of about 80km. Commercial traders are buying fish in big quantities and transporting it to Maroua.
The high demand for fresh fish in Maroua, has a positive effect on prices.

Contrary to zone 1, the villages in zone 2 are cut of from markets, particularly during the inundation period (which coincides with the fishing season), where roads are impassable, and

transportation only happens by pirogues. Since conservation of fresh fish over a couple of days is difficult / impossible, fish is either sold at the local (village) market achieving a lower price, or conserved by smoking or drying, which also enormously lowers the price. As a result, in spite of higher production costs, the average gross revenue from fishing in zone 2 is only about 63 percent of the revenue in zone 1. The same is true for fish traders. Especially in zone 1, this activity is taken up by non-fishing households. In zone 3, fishing as an income generating activity is negligible, and fish trade does not exist at all, since the captured fish is directly sold to consumers.

Table 3: Costs and returns of major livelihood activities per zone

	Zone 1		Zone 2		Zone 3	
Agricultural production	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Plot size [ha]	2.3	2.7	2.4	2.9	8.0	25.9
Rent for land	134.9	105.0	5.4	31.2	14.3	33.3
Agricultural production costs	371.3	297.5	148.9	166.4	107.2	105.1
Gross income from agricultural production	439.4	398.2	181.8	235.5	94.5	199.1
Livestock rearing						
Value of livestock [€]	539.9	866.3	671.5	1027.9	1516.5	2300.7
Livestock production costs	32.5	71.3	18.2	38.9	32.9	63.9
Income from sale of livestock	88.5	160.4	115.5	235.5	246.8	341.1
Fishing						
Fishing production costs	96.2	129.1	141.1	106.2	4.6	28.4
Gross income from fresh fish	298.3	596.0	31.3	216.6	1.6	12.2
Gross income from smoked fish	26.0	96.4	31.4	119.5	5.3	35.6
Gross income from dried fish	27.1	140.0	159.5	178.7	1.3	10.4
Revenue from fish trade	93.0	226.2	54.5	193.7	0.0	0.0

Source: baseline data

A breakdown of gross household income in the three zones is shown in Figure 3. It becomes obvious, that households in zone 2 have developed the most diversified portfolio. This can be a coping strategy to external livelihood conditions, while households in zone 3 can be considered as stock breeders. This portfolio decision, however, is not necessarily the result of particularly favorable conditions for livestock rearing, but rather the result of significant constraints regarding other income generating activities.

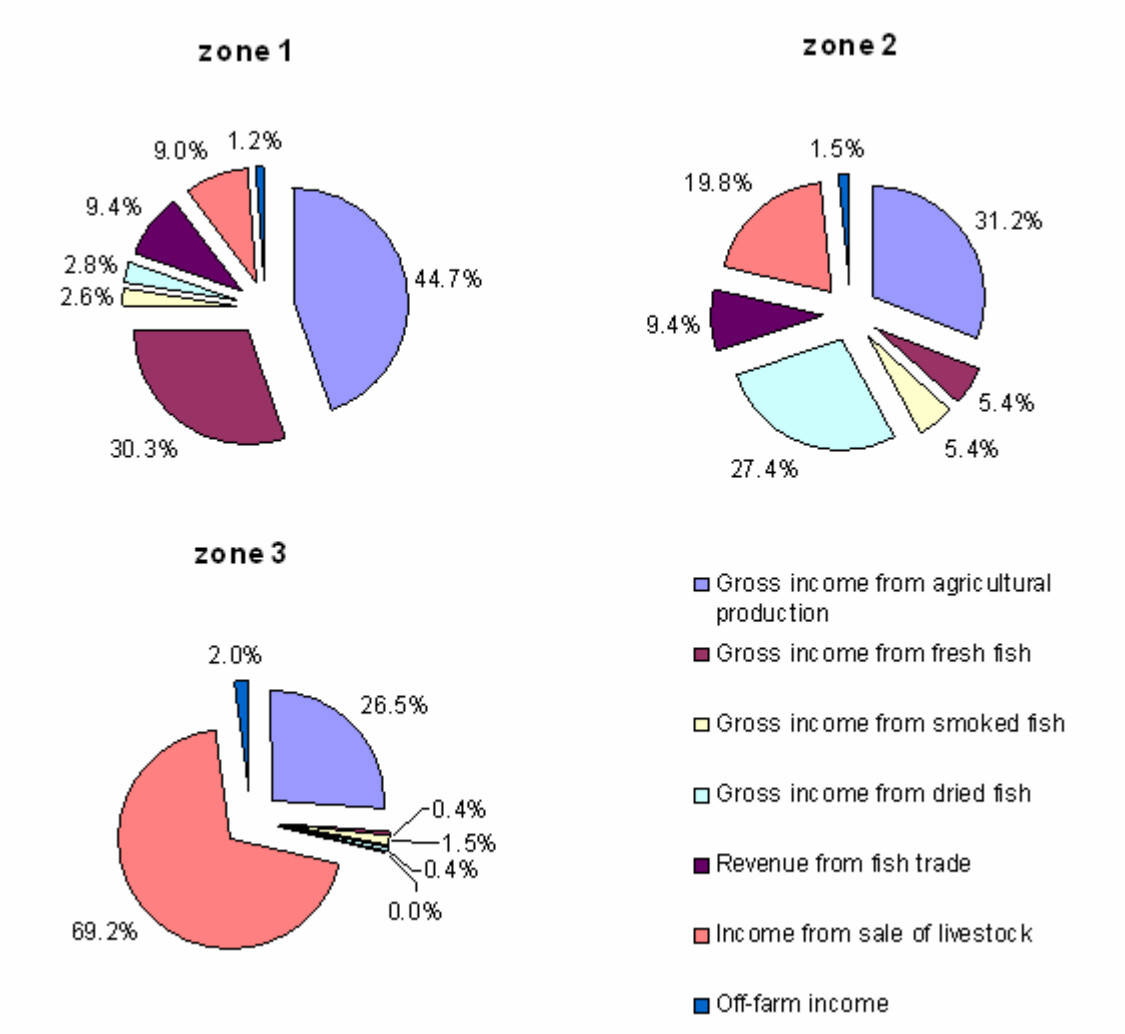

Figure 3: Income portfolio of households per zone

Source: baseline data

Hence, households in zone 3 may be considered most exposed to shocks. For example, outbreak of a livestock disease can endanger the basis of the livelihoods of those households.

In the baseline survey the question of shocks has been addressed? All respondents were asked in the baseline survey to report three major unexpected negative events that affected the household in the past 10 years. Table 4 gives an overview of the reported cases. Over ninety percent of the households experienced at least one serious shock during the past. The most frequent calamities faced by the households are heavy illness of an adult, death of an adult household member and crop pests. Also, 45 households (10.4%) reported to have suffered loss of productive assets (e.g. destruction of a pirogue or other fishing/agricultural materials, or confiscation of unauthorized fishing gear by state officers), which is also the third important shock in terms of total value of losses due to the respective shock (see Figure 4).

Table 4: Reported social, economic and ecological shocks in the past 10 years

Type of shock	zone 1	zone 2	zone 3	Total	Percent
No shock	3	22	17	42	9.7%
Heavy illness of an adult	29	77	27	133	30.9%
Death of an adult	24	26	6	56	13.0%
Heavy illness of a child	4	19	4	27	6.3%
Death of a child	11	9	6	26	6.0%
Loss of money	2	2	0	4	0.9%
Fire	0	0	2	2	0.5%
Loss of productive assets	4	27	14	45	10.4%
Drought	3	12	8	23	5.3%
Too much rain or flooding	1	10	0	11	2.6%
Crop pests	13	30	13	56	13.0%
Livestock diseases	2	3	1	6	1.4%
Total	96	237	98	431	100.0%
No of sampled HH per zone	55	166	78		
Average number of shocks per HH	1.75	1.43	1.26		

Source: baseline survey

As already reported above, crop pests are a major problem for agriculture in the study area, in combination with drought and too much rain or flooding. Due to the short time frame for agricultural production in zones 2 and 3, the destruction of fingerlings by pests or birds, some weeks after sowing, can mean the total loss of agricultural production for the respective season, since often it is too late to resume the cultivation of crops. This forgone revenue, plus production costs, had been included in the estimation of losses due to these shocks. According to expectations, farmers in zone 1 are relatively well protected from flooding, by the Maga dam. Due to the irrigation system, drought can not be considered as a considerable risk. In the two other zones, those ecological phenomena have to be taken more seriously.

Cattle diseases, on the contrary, are a rather rare incident. Only six farmers (1.4 percent) reported to have suffered from this shock, and only once in zone 3. The implied average losses (medication of animals and in some cases loss of animals, valued at the market price), however, are highest.

In general, demographic shocks entail relatively low average losses. The estimated value of loss due to a shock, such as illness or death of an adult/child, is calculated as the sum of costs for medical treatment and funeral, respectively. This, of course, is an underestimation of the

true damage of demographic shocks. For example, opportunity costs from lost labor force, and income, are not included.

Economic shocks, such as fire and loss of productive assets seem to also cause considerable losses in terms of forgone income and/or replacement costs.

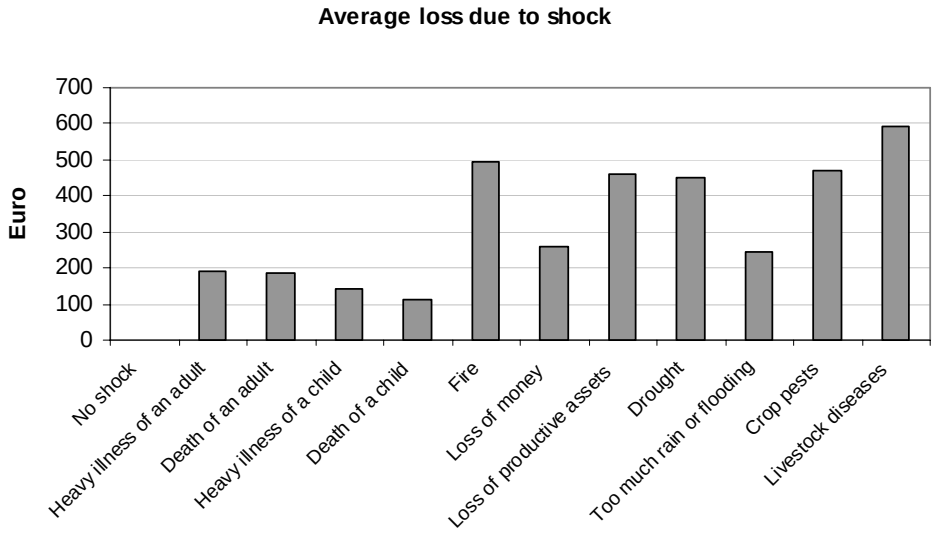

Figure 4: Average shock losses by type of shock
Source: own data

The picture changes dramatically, if aggregating losses from shocks of the same kind over all households, thus determining the effect of the respective shock on the total sampled population (Figure 5). Three major shocks can be identified, which is crop pests, heavy illness of an adult, and loss of productive assets (ranked by induced losses). If compared to the aggregated gross household income over all households, all shock losses, in the period covered by the baseline study (May 06 – May 07) would have used up 23.2 percent of total aggregated household income, which again shows the vulnerability of the households living in the study area.

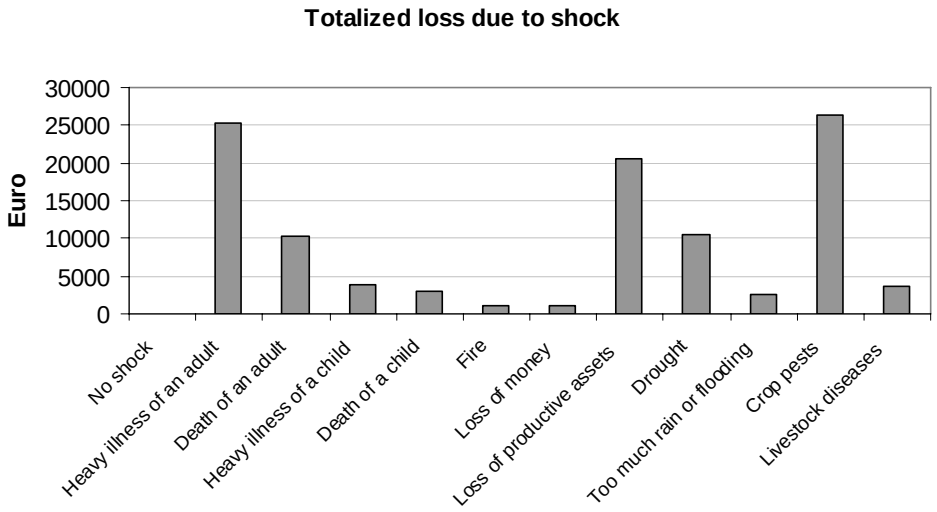

Figure 5: Total losses from shocks in Euro by type of shock
Source: own data

Concerning coping strategies, working harder and sale of assets (livestock and other assets) are the two most frequent ways to deal with losses. If taking the total value of respective coping activities, sale of assets is the incontestable means to counter shock losses, making up about 50% of total coping value.

Preliminary Conclusions

The rural population in Northern Cameroon, which depends on inland small-scale fisheries, is exposed to numerous social, ecological and economic constraints. Depending on the different external production conditions, households have adopted corresponding ex-ante coping strategies. Some indication can be drawn from the baseline survey that it is difficult to categorize households in distinct types. There are no pure farmers, fishers or livestock breeders, but diversification of various income sources is a major mean to adapt to the risky environment. At the same time considerable differences exist between the three zones, in terms of production conditions, such as the access to fish resources, or agricultural production possibilities. The analysis of a fraction of data collected during the baseline survey has shown that portfolio decisions are likely to be made on the basis of risk perceptions. Reliable conditions, like for example the rice irrigation system in zone 1, which protects farmers from the risk of drought or inundation, encourage household to concentrate financial and human capital on the cultivation of rice. Where the variability of returns to capital and labor is high, as it is the case in zone 2, a much more diversified income portfolio has been

adopted.

On the other hand, portfolio decisions are not only made because of the subjective perception of risk. Access to resources (or the lack of it) is a key factor for farmers in zone 3. While households in zone 1 and 2, which do not engage in fishing, for example, have deliberately chosen it due to some individual considerations concerning expected returns, variability of returns, or for other economic or social reasons, households in zone 3 have no other choice than limit their income sources to livestock rearing and agriculture.

To develop a model of household vulnerability and identify the role of asset endowment, income and consumption levels, will be the next task in this case study. Data from the second follow-up survey is expected to be ready-to-use by June 2008. This panel data set will allow the researchers to analyze the seasonal structure of economic behavior of households in the study area. Shocks that had appeared in the past, as well as during the period covered by the follow-up surveys are expected to have an impact on the economic situation of households. The ability to cope with those shocks in the form of ex-ante strategies and ex-post coping activities will be identified. In addition, the nature and exact sources of vulnerability to poverty will be investigated in order to present empirically documented information, which could prove useful for policy makers in designing appropriate policies for poverty reduction and prevention.

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