RIU

Tackling fish losses along the marketing chain

Validated RNRRS Output.

Three new tools help show what, where and how fish losses happen between fisher and consumer. Knowing the size and nature of these losses is the first step towards prevention. It's an important problem to tackle not only because millions of fishers, processors and traders make a living from fish but also because many fisheries globally are threatened. Proven in West Africa, these methods are already being used in the Philippines, Nigeria, Ghana, Cameroon, Chad, the Gambia and Senegal. FAO are now helping them spread to the Ivory Coast, Kenya, Malawi, Mali, Tanzania, Uganda and Mauritania. Potentially, these tools could also be adapted and applied to other foods such as fruit, vegetables, crops and meat.

Project Ref: **PHF08:**
Topic: **7. Spreading the Word: Knowledge Management & Dissemination**
Lead Organisation: **Natural Resources Institute (NRI), UK**
Source: **Post Harvest Fisheries Programme**

Document Contents:

Description, Validation, Current Situation, Environmental Impact,

Description

PHF08

A.   Description of the research output(s)

Research into Use
NR International
Park House
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Kent
ME20 6SN
UK

Geographical regions included:

Cameroon, Chad, Cote d'Ivoire, Gambia, Ghana, Nigeria, Senegal,

Target Audiences for this content:

Fishers, Processors,

1. Working title of output or cluster of outputs.
In addition, you are free to suggest a shorter more imaginative working title/acronym of 20 words or less.

Fish Loss Assessment and Reduction – field based methods

2. Name of relevant RNRRS Programme(s) commissioning supporting research and also indicate other funding sources, if applicable.

Post-Harvest Fisheries Research Programme (PHFRP)

West African Association for the Development of Artisanal Fisheries (WADAF) between 1997 and 2000 provided support for the validation process.

The FAO Regional Office for Africa funded the translation from English into French of Ward, A.R., Jeffries, D.J. (2000) A manual for assessing post harvest fisheries losses. Natural Resources Institute, Chatham, UK. The manual was the main output from R7008 and both the English and French versions were used by researchers under the FAO/DFID West African Sustainable Fisheries Livelihoods Programme which provided funds for loss assessment field research from 2004 to 2006.

3. Provide relevant R numbers (and/or programme development/dissemination reference numbers covering supporting research) along with the institutional partners (with individual contact persons (if appropriate)) involved in the project activities. As with the question above, this is primarily to allow for the legacy of the RNRRS to be acknowledged during the RIUP activities

D0063 (2001 – 2002) Ghana seedcorn needs assessment (post-harvest fish loss assessment in Keta District Ghana)

A0987 (2001) Development of a post harvest fish loss assessment project proposal by the Nigerian Institute for Oceanography and Marine Research

R7008 (1997 - 2000) Field and desk based tools for assessing fish losses: adaptation and validation in West Africa

R5027 (1993-96) Quantification of post harvest fisheries losses

Associated projects:

R6817 (1997 – 2000) Monsoon season post-harvest losses in traditional fish processing in India.

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*4. Describe the RNRRS output or cluster of outputs being proposed and when was it produced? **(max. 400 words)**.
This requires a clear and concise description of the output(s) and the problem the output(s) aimed to address.
Please incorporate and highlight (in bold) key words that would/could be used to select your output when held in a database.*

Post-harvest fish losses occur at many stages of the post-harvest chain from capture to consumption and have

long been a concern of development practitioners who wish to improve the **livelihoods** of fishermen, processors and traders and the contribution fish makes to **food security**. What makes the problem of fish loss particularly acute is that it occurs against a backdrop of dwindling or static supplies of fish from wild capture fisheries. Recognition of the important problem fish loss poses is reflected in the **FAO Code of Conduct for Responsible Fisheries** (CCRF) which promotes fish loss reduction.

One of the major constraints faced by development practitioners in many countries is the lack of information on the type of fish loss that occurs, the extent and effects post-harvest fish losses have on people's **livelihoods** and on **food security**. In order to effectively plan and allocate development resources to tackle the problem of losses requires an understanding of some, or all, of these issues to be in place.

In response three field based **fish loss assessment** methods were developed and finalised in 2000 [R7008] as a result of research started in 1993 [R5027]. The methods are designed to provide information which will inform poverty focussed **loss reduction intervention, monitoring**, **planning** and **policy** making for the development of the **post-harvest fisheries** sector. The methods are designed for use by intermediary organizations such as research institutes, extension agents and NGOs in conjunction with poor post-harvest fisheries stakeholders. The three methods are:

a) Informal fish loss assessment (IFLAM) – a practical, flexible way to quickly generate **qualitative** and indicative **quantitative** data on **post-harvest fish losses**. This method is based on the tools and principles associated with rapid and participatory rural appraisal (RRA and PRA) research and development methods. It is used to identify and understand where key losses occur and who is affected.

b) Load Tracking (LT) – is used to **quantify** losses associated with an activity or between different stages of a distribution chain. It is normally used following the application of IFLAM. A **quantitative** understanding of losses can be used to determine the effectiveness of **loss reduction interventions**.

c) Questionnaire Loss Assessment Method (QLAM) – is a formal questionnaire survey approach to quantitatively understand the type of loss incurred, reasons for loss and the variables, which affect loss such as fishing gear or processing method. It can be used to validate the results of IFLAM and LT over a wide geographical area or across fishing communities.

5. What is the type of output(s) being described here?
Please tick one or more of the following options.

Product	Technology	Service	Process or Methodology	Policy	Other Please specify
X			X		

6. What is the main commodity (ies) upon which the output(s) focussed? Could this output be applied to other commodities, if so, please comment

Main commodity: **Fish and fishery products**

The principles of the three loss assessment methods (informal fish loss assessment, load tracking, questionnaire loss assessment) could be adapted and applied to the assessment of losses associated with other foodstuffs such as fruit, vegetables, crops and meat.

7. What production system(s) does/could the output(s) focus upon?
Please tick one or more of the following options. Leave blank if not applicable

Semi-Arid	High potential	Hillsides	Forest-Agriculture	Peri-urban	Land water	Tropical moist forest	Cross-cutting

8. What farming system(s) does the output(s) focus upon?
Please tick one or more of the following options (see Annex B for definitions).
Leave blank if not applicable

Smallholder rainfed humid	Irrigated	Wetland rice based	Smallholder rainfed highland	Smallholder rainfed dry/cold	Dualistic	Coastal artisanal fishing

*9. How could value be added to the output or additional constraints faced by poor people addressed by clustering this output with research outputs from other sources (RNRRS and non RNRRS)? (**max. 300 words**).*

Please specify what other outputs your output(s) could be clustered. At this point you should make reference to the circulated list of RNRRS outputs for which proformas are currently being prepared.

The loss assessment methods are designed for use by intermediaries, who apply the methods with poor and vulnerable post-harvest fisheries stakeholders. Value added would be achieved by developing simplified parallel methods which can be used by post-harvest stakeholders themselves, to undertake their own loss assessment process.

The loss assessment methods are outputs of the Fish Loss Assessment and Control (FLAC) initiative of the PHFRP. R5027 and R7008 also developed other FLAC outputs - the Post-Harvest Fish Loss Model and FISHLOSS, a database of information on post-harvest fish losses. The model enables the user to present and link data on loss at different stages in a distribution chain and understand the effect of interventions. FISHLOSS is a source of reference for people interested in studying post-harvest fish losses. The loss assessment tools are designed to provide data that can be used in the model and incorporated into FISHLOSS.

The Post-harvest overview tool (FishPHOM) developed by R8111 enables the user to develop a macro level understanding of a post-harvest fishery sector to guide policy and planning. It presents the sector in the context of national development objectives, the current situation with regard to supply, transformation and consumption of fish, changes which are taking place, key institutions involved and an intervention strategy. The loss assessment methods develop an understanding of post-harvest losses which feeds into the macro level understanding developed by FishPHOM.

Clustering the outputs with the participatory intervention approach developed by R6817 in India would combine the loss assessment process with a field based practical approach to identifying suitable, demand led, loss reduction measures.

As well as R6817 the loss assessment methods should be clustered with R6959, R6824, R7971 which focused on producing technical loss reduction interventions and are also part of the FLAC initiative.

Validation

B.   Validation of the research output(s)

*10. **How** were the output(s) validated and **who** validated them?*

*Please provide brief description of method(s) used and consider application, replication, adaptation and/or adoption in the context of any partner organisation and user groups involved. In addressing the "who" component detail which group(s) did the validation e.g. end-users, intermediary organisation, government department, aid organisation, private company etc... This section should also be used to detail, if applicable, to which social group, gender, income category the validation was applied and any increases in productivity observed during validation **(max. 500 words)**.*

Under R7008 field validation was undertaken by research teams in four countries – two Anglophone and two Francophone. The methods were replicated by intermediary organisations in conjunction with extreme vulnerable poor and moderate poor groups of artisanal small-scale fishermen from coastal and inland fishing and processing communities, urban fishing and processing communities, with traders, transporters, wholesalers and retailers. The majority of processors were women. The field application was evaluated and outputs adapted accordingly. The validation process was monitored and evaluated by WADAF and FAO via workshops and field visits.

The table below provides an overview of the different organizations that have either applied, adapted, validated or evaluated the outputs under the different projects:

Partner Organization	Country	Type of Organization	Role
FAO Fisheries Department	Multi-lateral	International	Evaluation, validation, publication, translation into French
Fisheries Division	Tanzania	National government	Design, application, adaptation
Directorate of Fisheries	Ghana	National government	Application
Nigerian Institute for Oceanography and Marine Research	Nigeria	National research	Application, adaptation, follow-on
Institut de Technologie Alimentaire (ITA)	Senegal	National research	Application, validation, adaptation

Food Research Institute	Ghana	National research	Application
Mangalore College of Fisheries	India	National research	Adaptation and validation
University of Cocody	Ivory Coast	Academic	Application, adaptation
Kwame Nkrumah University of Science and Technology	Ghana	Academic	Application, validation incorporated outputs into syllabus
Catalyst Managment	India	Development Consultancy	Adaptation and validation
Integrated Coastal Management	India	Development Consultancy	Adaptation and validation
Mwanza, Musoma Municipal Councils	Tanzania	Local government	Application
Keta District Assembly	Ghana	Local government	Application, provided funding
Collectif National des Pecheurs du Senegal (CNPS)	Senegal	NGO	Application, validation
KISMET	Ghana	NGO	Application, sourced funding
Kormanste Fishmongers Association, Sekondi Fishmongers Association, Chorkor Co-operative Fish Smokers Society Limited	Ghana	Private sector co-operatives	Application, validation
Tedak Fishermen Co-operative	Nigeria	Private sector/NGO	Application, validation

An evaluation of the validation exercises by the Fish Utilization and Marketing Service (FIIU) of FAO consisted of country visits and workshop to assess the use of the outputs and determine how they should be used in future. A major positive outcome was a commitment by FAO to publish the outputs as a manual. FAO also subsequently translated the outputs into French for wider dissemination and uptake in West Africa. This endorsement of the outputs by FAO was important in terms of validation.

The field validation process led to the identification of loss reduction interventions which were subsequently pilot tested to determine the potential benefits to small-scale post-harvest operators. The outputs were endorsed by the College of Visayas in the Philippines which secured funding to apply the outputs. The Nigerian Institute for Oceanography and Marine Research included a loss assessment programme within their 2001/2 budget. The outputs were subsequently used by national, local, NGO and academic researchers in Ghana as part of a district level study using local government funds and the outputs were adopted by the Kwame Nkrumah University of Science and Technology in Ghana.

11. **Where and when** have the output(s) been validated?

*Please indicate the places(s) and country(ies), any particular social group targeted and also indicate in which production system and farming system, using the options provided in questions 7 and 8 respectively, above **(max 300 words)**.*

Between 1997 and 2000 the outputs were validated by research teams in Senegal, Nigeria, Ghana and Ivory Coast in conjunction with private sector small-scale (artisanal) post-harvest fisheries stakeholders.

In Ivory Coast the outputs were validated by the research team in conjunction with marine fishing communities in Vridi-Sir, Vridi-Ako and Vridi-Zimbabwe fishing villages/sites and Chicago smoked fish wholesale market, all within Abidjan and its environs. The choice of communities was made by the research team and the marine artisanal section of the Centre for Oceanographic Research, Abidjan.

In Senegal validation was undertaken with fishermen and processors within the coastal town of Mbour and traders who transported fresh fish by road from Mbour to Dakar. The outputs were used to assess losses associated with *Sardinella spp.* An important aspect of the validation in Senegal was that the research team consisted of fishermen and processors as well as a team leader from ITA.

After a mid term evaluation workshop from which lessons were learnt from Ivory Coast and Senegal, the outputs were applied in Ghana and Nigeria. In Ghana the outputs were used in conjunction with women fish processors to assess losses in the coastal town of Kormanste. In Nigeria the focus was on Lake Chad, an important freshwater or inland fishery. The outputs were applied by the research team to assess losses occurring in the post-harvest sector in fishing villages in the Lake Chad region, two smoked fish wholesale markets in Borno State and one smoked fish market in Lagos and to assess losses between Maiduguri and Lagos.

In India under R6817, IFLAM was adapted and used with groups of extreme vulnerable poor small-scale women fish processors communities in Kerala, Tamil Nadu, Orissa and Andhra Pradesh and QLAM was used to validate key qualitative data on losses and processing across coastal Andhra Pradesh and Orissa.

Further application of the methods was undertaken in 2002 by a multi-agency team with fishing communities in Keta District, Ghana.

Current Situation

C.   Current situation

12. **How and by whom** are the outputs currently being used? Please give a brief description **(max. 250 words)**.

From 2004 the outputs have been used by the FAO/DFID West Africa Sustainable Fisheries Livelihoods Programme to:

- Build capacity of national researchers;

- Generate baseline data to measure impact of interventions;

- Develop the understanding of the significance of post-harvest fish losses;

- Identify key post-harvest fish losses;

- Identify interventions;

- Develop normative guidance for the FAO CCRF.

From November 2006 FAO's FIIU are to apply the outputs in Africa to build capacity and implement loss assessment initiatives in 6 countries. The objectives are to generate information to guide national planning and policy making and loss reduction, develop normative guidance for the CCRF and support FAO's post-harvest fisheries programme for Africa.

As a result of output use in Keta District, Ghana, the Kwame Nkrumah University of Science and Technology are using the outputs for research on freshwater fisheries and have incorporated them into a newly structured undergraduate course in post harvest technology. The University intend to apply the outputs further in Ashanti and the Northern Region. The University also see application of the techniques (particularly load tracking) for assessment of post harvest losses in other agricultural sectors such as vegetable and cereal crops.

*13. **Where** are the outputs currently being used? As with Question 11 please indicate place(s) and countries where the outputs are being used (max. 250 words).*

The outputs are currently being used by the FAO/DFID West Africa Sustainable Fisheries Livelihoods Programme's Post-Harvest Pilot Project which is working in Cameroun, Chad, the Gambia and Senegal. The outputs are being used in the project areas or zones in each country.

FAO Fish Marketing and Utilization Service are to build the capacity of researchers from Ivory Coast, Ghana, Kenya, Malawi, Mali, Nigeria, Tanzania, Uganda, Cameroun, Chad, the Gambia, Senegal and Mauritania in the outputs. The outputs will be applied by researchers in 6 of these countries to assess losses and implement loss reduction interventions.

In Ghana by the Kwame Nkrumah University of Science and Technology (KNUST).

14. What is the scale of current use? Indicating how quickly use was established and whether usage is still spreading (max 250 words).

As a consequence of the interest in post-harvest losses and support from FAO, the interest of national research centres and the dissemination efforts of the PHFRP, use of the outputs has and is continuing to spread in Africa.

Following the work of the FAO/DFID SFLP which has built the capacity of researchers in four countries, FAO now intend to undertake widespread application of the outputs in Africa and see uptake and application in at least 6 other countries. This work will also ultimately lead to greater and easier access to the outputs and large scale dissemination and promotion at the global level via FAO and the association of the outputs with the FAO Code of Conduct for Responsible Fisheries (CCRF). The general synopsis for Africa is that use of the outputs is spreading steadily and will continue to spread as a result of the on-going support of FAO.

15. In your experience what programmes, platforms, policy, institutional structures exist that have assisted with the promotion and/or adoption of the output(s) proposed here and in terms of capacity strengthening what do you see as

the key facts of success? (max 350 words).

The PHFRP through its FLAC and seedcorn initiatives and support for capacity building in the outputs was instrumental in getting the outputs known and adopted by FAO.

FAO were involved in an advisory capacity at the beginning and during the research. This facilitated their adoption of the outputs. FAO translation of the outputs into French facilitated capacity building in Francophone Africa.

FAO are an important driver of post-harvest fisheries development initiatives. Due to the food security implications, FAO have been interested in understanding and reducing post-harvest fish losses since the 1970s and this is still core to their work. They are currently the most important promoter and user of the outputs.

The FAO Code of Conduct for Responsible Fisheries (CCRF) provides important policy guidance for the development and sustainability of the fisheries sector. It has been adopted by many countries and it highlights the importance of reducing post-harvest losses. This has helped ensure that losses are given a high priority in national policy and has triggered recent and current initiatives by the FAO/DFID SFLP and FAO's FIIU which are developing normative guidance to support the implementation of the CCRF.

Partly in response to the CCRF, but also as a consequence of a historical interest in post-harvest losses, encouraged by FAO, national fisheries development policy in many countries highlights the need to reduce post-harvest fish losses. As a consequence of national policy, Departments of Fisheries and national research centres in many countries are committed to loss reduction.

The general growing interest in informal / qualitative approaches to development and the associated capacity building which has been undertaken has facilitated the uptake and use of IFLAM.

The development of the outputs, their validation and use in the field has been primarily undertaken by the intended end-users from intermediary organisations. As a consequence the outputs have been fine tuned to the needs and ability of this group.

The outputs have their champions, people who see the usefulness and importance of applying the outputs. The interest of these "champions" not only facilitated the development of the outputs but also led to subsequent application by SFLP and FAO.

Environmental Impact

H.   *Environmental impact*

24. What are the direct and indirect environmental benefits related to the output(s) and their outcome(s)? (max 300 words)

This could include direct benefits from the application of the technology or policy action with local governments or multinational agencies to create environmentally sound policies or programmes. Any supporting and appropriate evidence can be provided in the form of an annex.

The outputs are designed to identify opportunities to improve efficiency of post-harvest fisheries activities and reduce wastage. In terms of improving efficiency, this would involve the promotion of fuel-efficient fish smoking technology which has the positive environmental impact of reducing pressure on wood resources. Other positive environmental benefits which are likely to accrue include better waste disposal techniques, reduction in the use of environmentally unsafe pesticides for insect control in dried fish and reduced discards of fish which facilitate unsanitary conditions at fish landing beaches and processing areas.

In terms of indirect benefits, the use of the outputs will draw attention to the FAO CCRF which provides general guidance on environmentally sound fisheries practices, including post-harvest practices.

*25. Are there any adverse environmental impacts related to the output(s) and their outcome(s)? **(max 100 words)***

No. None have been identified to date and will not accrue if best practice is applied when implementing loss reduction initiatives (see CCRF for general guidance).

*26. Do the outputs increase the capacity of poor people to cope with the effects of climate change, reduce the risks of natural disasters and increase their resilience? **(max 200 words)***

Climate change effects the productivity and species make-up of fisheries. Application of the outputs will help intermediary organisations, as well as the poor themselves, to understand change and how fish utilization practices may be being effected. In turn, opportunities to mitigate negative changes can be identified and implemented.

Many post-harvest fisheries stakeholders, particularly those reliant on inland fisheries, are also engaged in agricultural activities. By improving the efficiency and profitability of post-harvest fisheries activities can help compensate for reduced yields and the effects of natural disasters which effect agriculture.