



OF PLASTIC

HANDBOOK

Waste at sea. The value of waste for a new profession.







HANDBOOK

Waste at sea. The value of waste for a new profession.

Texts and technical-scientific advice **Roberto Odorico** Illustrations

Greta Odorico

With the collaboration of:

Antonio Pucillo Flai CGIL Nazionale Fishing Department

Raffaele Ferrone Flai CGIL Nazionale Fishing Department

This publication was made possible with a contribution from the **Ministry of Agricultural, Food and Forestry Policies**, as part of the National Triennial Fisheries and Aquaculture Programme referred to in Art. 17 of Legislative Decree 154 – Annuality 2020 MD 9874 of 10 June 2020.

INTRODUCTION

Last year, with the FLAI CGIL fisheries project, we carried out a research project entitled "To those who are able to save our seas", a study intended to address the issue of the pollution produced by plastic in our seas. The research was carried out in collaboration with groups of fishermen from ten different ports, around Italy. A worrying picture emerged and not only for the environment, but above all for the future of this sector and all the related industries that revolve around the world of fishing. The data is alarming: an estimated 5.25 trillion pieces of plastic are present on the surface of the sea globally. A mountain of plastic, weighing 268,940 tons, without considering the guantities to be found in the water columns and on the seabed, or inside marine organisms. A terrifying fact that is impossible to quantify in our own seas as well. It is estimated that between 1,000 and 3,000 tons of plastic are accumulated in the Mediterranean. A situation that has to alarm us because, unlike what happens on land, we are unlikely to have a visual awareness of the problem at sea. The accumulations of plastic are left to their fate, at the mercy of the currents, wandering about undisturbed until, covered with micro-organisms, they settle on the seabed, or, degrade into nano- and microplastics with the risk of being mistaken for food by fish.

For those who are unfamiliar with this situation, it is hard to grasp the disaster that is taking place within the marine ecosystem. This is what we are told by the fishermen, the only people who fight this problem on a daily basis and who provided the inspiration for the work of last year. Plastic, but marine waste in general, is an obstacle to their daily work. It dirties the boat, damages equipment, wastes precious time during the sorting of fish, is a risk to the health and safety of workers and, above all, is a problem that is repeated and will continue to be repeated until we find a solution to prevent urban waste ending up in the sea. Beginning with the recovery of what is already present in the depths would be a good place to start and, in this, an important role can be played by fishermen as demonstrated through the research project "To those who are able to save our seas". Even though today the professional figure of the "plastic fisherman" does not exist, there are fishermen in flesh and blood instead, and they have the professionalism and experience to learn how to avoid becoming anything else, maintaining their own identity. What we mean is professionalism and experience in choosing the right areas, optimising work on board, avoiding waste that does not produce profit but loss... unless we find a way to exploit waste. In reality, the aim of this handbook is to alter ambitions. Rather than fighting the problem, we could enhance a potential resource. Now is the time to look around, onshore as well, where it is possible to take an active part in a market that sees waste as a potential resource and develop an overall service that protects the fishing grounds, quality employment and the product. Talking about waste, and therefore about plastic, means taking measures to keep the supply chain healthy and safe, but also entering – with a new awareness and role – into the management systems of resources through the ports, with the launching of services related to everything that is landed and its differentiation. We can enter a new market, a system that integrates different supply chains, such as that of waste, managing to grasp its strengths to support the efforts of the sea.

To do so, it is necessary to launch a path of training and information for workers on the right way in which waste found at sea should be handled and stored. In the Mediterranean there is more than simply plastic. We find wartime residues, chemical products, industrial processing and other waste of dubious origin, and we cannot place the fishermen's health at risk; and then, once stowed, where do they take what they find in the nets? Here it is necessary to initiate a work of interconnection and management of marine waste from the moment it arrives in port. Where should it be deposited? Who should deal with it? How should it be transported and stowed? What waste can go to the collection centre and what has to be sent along special routes because they are dangerous? Whose task is this? And how should it be handled to avoid risks for the whole crew? How to manage the catch and safeguard it from polluting agents? The following pages also deal with this to inform workers about the risks related to waste collection and its correct storage and disposal with a proper connection to the urban waste system.

At stake, with the excuse of waste and plastics travelling in the plastisphere, is employment, the experience gained over time which applied once more to problems, transforms them into opportunities and economic sustainability. A fisherman who does not float passively on plastic (and market forces...), but organises and solves his own problems, using the same quay where he lands the product, recognising an activity that is already carried out in many ports, but is not adequately remunerated. So to avoid becoming a plastic fisherman and remain a fisherman in flesh and blood, it is necessary not only be a plastic fisherman to defend the quality of the product, but also to be an organiser and user of services on land. This will provide continuity with the work carried out last year in the "**To those who are able to save our seas**" project, which saw in the possible and proven cooperation of fishermen an opportunity to set out on an environmental path to the recovery of our seas but, above all, an opportunity for the development of employment and new professional skills.

Antonio Pucillo

Head of Fisheries Department CGIL Flai Nazionale

CONTENTS

1. WASTE AND THE PLASTISPHERE	
2. SO AM I CATCHING Plastic Fish ?	12
3. WASTE ON DECK A WASTE OF WORK	16
4. WASTE AND RUBBISH REDUCE THE EFFECTIVENESS OF FISHING	22
5. TRANSFER THE ATTENTION of work at sea to land	28
6. WASTE, RUBBISH, SCRAP, REGULATIONS	34
7. WASTE AND RUBBIS OR RESOURCE AND SECONDARY RAW MATERIAL	38
Self-assessments and practical test exercises on fishing areas	42
Useful materials for consultation and reference	44

WASTE AND THE PLASTISPHERE

In a classification of onboard rubbish, next to the organic, which onboard is fish waste, and paper, metal and glass, we find a volume of plastic that towers over the other mountains of rubbish we produce. Its indestructibility and lightness compared to other waste materials mean it is extremely invasive for the ecosystem. Thanks to this ability to infiltrate all the ecological cycles, more than any other waste, we speak of plastisphere. Nature tries in every way to degrade these materials which is why the attempt to make it disappear has dispersed it everywhere. Living without plastic is practically impossible. Our society would disappear; hospitals, cars, furniture, boots and oilskin would disappear. So plastic, and there are many types of plastic, is an indispensable material, an intelligent product, which has evolved over time with respect to our difficult demands; it is democratic because it has entered every society and improved them all in an economic and inexpensive way, it has made the distribution of food fast and efficient, as well as ensuring its wholesomeness, and it has contributed to bringing life to many places on the planet.



Source: Adapted Geyer, Jambeck, Law, 2017.



But how much plastic is there round about us? How much are we producing and how much do we then find in the sea? Enormous numbers which, however, do not properly render the extent of the problem. Plastic is light and those frightening plastic islands in the middle of the oceans in reality have densities of half a kilo per square kilometre; the plastic that floats alongside boats in ports will be a few hundred grams, again per square kilometre. Plastic wanders around the world and the plastisphere is not able to close the circle by transforming and regenerating it in significant quantities. This is because there is already so much around and only now are we trying to reduce waste by focusing on the circles that can be closed through reuse and recycling, rejecting the disposable where it is not essential.



Source: Culligan, 2019.

So there is unnecessary waste that has to be reduced and less useless waste that has to be placed within the mechanisms of disposal or basic transformation to prevent dispersion. The production of the bottles of water that we buy at the supermarket in packs of six and its transparent packaging probably best illustrate the extent of the problem. In Italy, about 10 billion litres of water are bottled annually, producing 330,000 tons of PET, using 650,000 tons of oil and 6 billion litres of water. In other words, to drink a litre of bottled water, we remove more than half a litre of water from nature that I will never drink again because it will remain in the material of the bottle and therefore disappear for ever from the water cycle.

Plastic is part of life onboard, of equipment, but also of the way of keeping those who work there warm and safe. In this context, on the one hand, plastic is indispensable, on the other, it is particularly invasive since the sea is the last receptacle where nature tries to conceal it by inserting it into the ecological cycles. Fishing activity therefore takes into account:

- the choice and wholesomeness of the production areas (control of waste contamination);
- an increase and improvement of onboard activities (timing of sorting and product selection phases);
- the enhancement and control of the landed product;
- the division of costs on improving product quality;
- an increase and diversification of the landed product;
- an increase in management services for the landed product.





Source: NIVA.

Over the years plastics and microplastics have spread throughout the marine environment to the point that they become smaller and are dispersed in multiple transport systems. Therefore, for marine organisms and fisheries, there are two possible problems:

- the presence of waste on the seabed, including plastic, which when fished out increases the work onboard in separating the product;
- the high concentration of microplastics and nanoplastics coming from waste accumulation areas, being carried by the currents and entering food chains.

Experience determines the quality of the product free from contamination. A good practice, dictated by a knowledge of the accumulation areas, is based on the guality and yield of the fishing areas. This factor depends on the distances that can be maintained from the seabed with high percentages of waste and from their dispersion. The yield in product and the decrease in time for sorting the catch from detritus is a good indication for a correct choice of fishing areas. A constant evaluation of fishing days in terms of the catch can clarify whether or not it is better to fish in areas with detritus and waste. In the case of the red boat (see figure below) and therefore of the prevalence of waste over the product, there could be problems on deck where greater space is required to stow the volume of plastic. In the case of the green boat *w*, even if in an area on average free of waste, there are about 3/4 kg of plastic per Km², 1 case out of 5 of fish. To this we have to add the heavier materials, but this moves less, sinks into the mud, is covered with organisms, and the sea often manages to hide and transform it.



SO AM I CATCHING PLASTIC FISH?

Millions of tons of waste follow the paths of nature to the sea where they are transported by the waves and currents following the ecological cycles, and accumulate where the currents stop mixing the heavier waste, which sinks once weighed down by encrustations and algae. Metal and glass travel shorter distances and indicate places of origin nearby, ancient and modern illegal activities or disastrous natural events, such as those that seem to occur more and more often nowadays. Plastic moves more, often travelling great distances, not transforming, but being made smaller and smaller by the waves and currents. Time exposes it to mechanical forces that reduce it to fragments. The process is very slow and in fact does not involve transformation or decomposition insofar as plastic is not recognised by the decomposers that degrade other waste. Only if beached and exposed to the sun does it undergo a slow degradation by UV rays which still does not transform it but merely fragments it. Biodegradable plastics and policies to reduce disposable materials subtract only a part of this "modern" waste from the plastisphere but undoubtedly avoid an increase in the accumulation of material condemned to roam the seas and fragment eternally. The resistance of the simply smaller residues from older plastic translates into an almost capillary diffusion in all the seas of the world, even the least populated ones, entering the food chain.





The more infinitesimal the fragments, the more they insinuate themselves into the ecological cycles that regulate marine life, and therefore fishing. Fishing has to respect the reproduction of species and the growing areas of fry; eggs, larvae and juveniles are transported until they are strong enough to swim against the current and reach the fishing grounds. In the plastisphere, the fry carried by sea currents might come across plankton full of microplastics and fill their stomachs. Sating themselves with inert material, they stop growing and... remain undersized if they not starve in the midst of an abundance of this food that is not food! Despite the numbers and data that so far speak of truly infinitesimal effects compared to better-known chemical contaminations, even if it is not as underhand as a chemical poison, this micro-invasion can create substantial damage in the marine ecosystem and food chain. Here, the control of fishing areas and therefore of the product and its traceability becomes an even more fundamental resource to be exploited in an ecological key as well.

2

But accumulation and contamination are in fact limited to organisms which, like us, ingesting a plastic particle, release it the next day into the environment! Of course, the quantities can be lethal to many animals as demonstrated by widespread and striking examples in the higher trophic levels.

In the food chain we find ourselves in the company of turtles, marine mammals, but in terms of the concentration and diffusion of the phenomenon, the true levels of alarm are still unclear, and need to be sought in the lower levels where they coexist with chemical contamination (blue and red dots in the figure below).

Biomagnification means that, moving up the food chain, these concentrations increase at each level before accumulating at the top. With chemical contamination this, unfortunately, is very widespread, while for microplastics and nanoplastics it involves an infinitely smaller proportion, and only the digestive system which is almost always scrapped before the product is consumed.

But now is the time to follow the phenomenon where it is not yet overly invasive and still controllable. A system that has a degree of analogy with the control of pests such as anisakis to start evaluating microplastics might also be useful alongside detritus detection. What is required is a transparent bag in which to place one or more stomachs and intestines. Then pressing them a little between the fingers and examining them against the light might help to identify fragments of microplastics.



Source: Ivar do Sul, J. A., & Costa, M. F. (2014).



Attention to the consumer meets with attention to the environment.

Knowing the different fishing areas and their productivity is useful because these guarantee the guality of the product and of the marine ecosystem. In this sense, a controlled origin of the product can be achieved, transforming it into an added value, a traceable guarantee which in turn would allow it to be sold at more advantageous prices, gaining the trust of the consumer, rather than leaving them with doubts or distrust regarding the supply chain. Control and traceability is nothing more than what is expected in any case on landing. The areas would also guarantee a very low percentage of waste and any plastic recovered together with the product would be a minimum amount released from the areas in which it accumulates. Thus its elimination from fishing areas would be a sort of effective "ordinary maintenance" carried out in areas with a low level of contamination to make them even cleaner. Interventions organised in the accumulation areas, usually far from the fishing areas, will be "extraordinary maintenance" aimed at lowering the density of the accumulation of detritus by reducing its dispersion. Plastic fish is, therefore, what is caught by the plastic fisherman who goes to look for it in the wrong places.

WASTE ON DECK IS A WASTE OF WORK

Someone knowing the effectiveness of their work means being able to set productivity day by day paying attention to the fishing area and the suitability of what is landed on the guay.

A meeting point of the measurable and of experience, it means foreseeing what to expect from a day of fishing, taking into account the work on board. The product and its guality on the market is the determining factor that guides the success of fishing. The good practices that guide the best choice of fishing areas, knowledge of target species and selectivity aimed at reducing work onboard, should all be aimed at this.

With regard to work onboard, there may be several factors that make it effective and productive: the waste and scraps in the nets on deck affect the balance sheet at the end of the day. The more time spent sorting the product, the less attention will be paid to maintaining its quality; and the less attention paid to cleaning and the product for sale, the lower the quality of work in general. Therefore, choosing litter-free areas makes fishing more advantageous because it avoids burdening it with substantial production costs.

Therefore, at the basis of a coexistence with detritus and waste and a product of quality there are some basic guidelines on which professionalism should be based.

Planning means:

- to estimate (and then record) the days and guantities of product, also with respect to what is understood as waste and therefore as extra work done to obtain a product of acceptable quality;
- to classify fishing areas according to productivity and lower (if at all) presence of dirt on board;
- to analyse the characteristics of the waste by relating it to the actual days considered as productive.

THE MOST PRODUCTIVE DAYS

How many days do I go out to sea? Do I know my costs?

How many days do I earn more than I spend? How many days would it be better to stay in port? How many days do I have a good catch?

This is the calendar year of 365 days

These are the fishing days (sailings) These are the most productive days These are the days when I at least cover my costs

These are the least productive days (few fish, problems sailing, etc...)





3

EFFECTIVENESS OF A CATCH

Fishing in uncontaminated areas Fishing for species of which I know the spread Fishing for species whose health I can guarantee







Rubbish indicates the state of health of the fishing area Rubbish should not be thrown back in the area where I fish Rubbish is a secondary raw material

A professional who knows the ecology of his operating area establishes and manages a priority between the fishing areas available and the probability of landing a quality product at the quay. Fishing in the three situations ($\cancel{2}, \cancel{2}$, $\cancel{2}$) means transforming and adapting the habit of onboard sorting into a lower quality product as waste and scrap grow. If not directly above the accumulation areas, landing waste and rubbish means, over time, expanding the availability of areas and since the usual sorting work is then transformed into the cleaning of fishing areas when crews find themselves with an excess of material on board. Qualifying this work means carrying out activities of enhancement on the guay and participating in the preparation and organisation of what is landed by connecting it with supply chains that are already present on land.





The cleanliness of the deck represents the confirmation of the seabed and its health: I cannot throw back into the sea what I will go to fish the next day! 90% of non-target species die or are immediately preyed upon. The waste (unsellable product) thrown into the sea is ecological waste, that is, of the energy it took to produce them, which is not balanced by their return to the natural cycle nor justified by the "working energy" of the fisherman who works in raising them, separates them from the product and then throws them back into the sea, adding them to the costs of the product to be sold.



3

4.5 euros is the disposal cost for a quintal of material. Quantities that are found in a after about 20 days. That makes 0.30 euros/day. At the other extreme, *pulls up less product, but also 10, 100 times more in terms of waste and rubbish.*

Professionalism therefore inevitably diversifies in many cases, adapting to different chains that intersect, depending on how the choices of the day are modulated and how, over time, demand ends up changing choices in the sector, including those tending towards the good sense of bringing waste back to land.



WASTE

CONSUMPTION

WHEN IS MY FISHING EFFECTIVE?

My fishing is effective:

- when I manage to earn with what I fish;
- when I manage to have less waste and more target species;
- when I manage to deal with the by-catch;
- when my product stays healthy;
- when my fishing area stays clean.

Fishing is difficult, but it becomes more so if work onboard is wasteful.

- Fish as much as possible in areas that are litter-free (or almost) and contribute to their expansion, avoiding contact with the various detritus.
- Waste must not be thrown back into the sea. Pointless work should be avoided, which is repaid by the production costs of the fish and therefore by low earnings, as well as contributing to a useless vicious circle of recovery and rejection of the same material.
- With the **unloading of waste and rubbish on the quay**, priorities and needs useful for development or implementation are established.
- The system of supply chains now separated which, starting from the landing, connect the fishing world with the new one of the reuse and recycling of the secondary raw material.



WASTE AND RUBBISH **REDUCE The effectiveness of Fishing**

The three boats have expectations and work onboard, but also precautions, which vary according to the quality of the fishing areas. The preference is for products that require minimal sorting, cleaning and preparation for the next sailing; towards *P* a decrease in product should be expected that will require more selection work on board, but also a greater opportunity to transfer and diversify production costs on to quay services that would otherwise make the landing unprofitable. Allocating the less profitable fishing days to *P* would change the purpose towards the product by dedicating the work to cleaning and reclamation. The low output of the negative days is therefore compensated by an activity that basically enhances that which on land becomes secondary raw materials.





The drawing up of the net marks greater attention to the consumer and therefore to the supply chain. Working safely means a state of maximum alert before opening the net, to avoiding unloading dangerous materials.

- Make sure that the product does not deteriorate by separating it from the rest as soon as possible, guaranteeing its wholesomeness;
- make sure that the "rest" does not contaminate the product from the next haul, even just by contact, or, worse, is not thrown back into the sea with the risk of finding it in the net the days that follow;
- avoid creating accumulation areas (e.g. before entering port) which before long would facilitate the work of aggregation and dispersion that nature already does very well on its own!

24

The residue, the drum containing toxic or radioactive substances immediately transforms the fishing operator into a chemical technician, a bomb-disposal expert, a fireman. Experience and common sense, more than specialisation, have to ensure you work automatically in simple concepts. First health, then the catch... So stop everything; if you are lucky and everything is still in the net, place it back on the seabed, note the coordinates and calls the harbour office to activate the emergency protocols.



Take an extra precaution if the intact bomb is onboard:

- Move away (or move it away) at least 200 metres. Do not use electronic communication devices
- Call from a mobile phone or VHF only if the devices are at a safe distance (e.g. attract the attention of another boat, maritime signals, danger flag).



CALL (OR HAVE SOMEONE CALL) 1530 OR CH16

WASTE AND RUBBISH REDUCE THE EFFECTIVENESS OF FISHING



The risk assessment starts far from the fishing areas. Raising a net aboard is a final check that has to always be successful. Assess the risks and act prudently:

- ready to open the net;
- identify the risk;
- move the crew away and raise the alarm;
- communicate the risk to the HO.

The selectivity and wholesomeness of the product depends on the quality of the fishing area:

- The good fishing area is the one that makes you work less in sorting because waste and rubbish are rare
- Observe and report suspicious anomalies (movement of ships or boats, patches of oil, drums)
- Avoid bringing the net onboard if you suspect a product might be contaminated
- Keep the crew at a distance, then assess the situation and call 1530 onshore
- Try to establish the risks you face to put in place a proper procedure

YOUR HEALTH AND THAT OF THE CREW COMES BEFORE THE PRODUCT





Isotopes are normally handled behind special shields and containers to avoid the emission of dangerous particles. Their illegal disposal undoubtedly causes outflows and unwanted contamination which the water and seabed in which they are fished are able to isolate and weaken, as does the thickness of the cement and lead. It goes without saying that distance and time of exposure need to be limited, and the inhalation and ingestion of isotopes that have come into contact with other materials has to be avoided.

Most of the time the risk for the product will be due to rubbing in the net with inert materials recognisable and traceable to domestic separate waste collection.

Some situations will see low risks related to contamination of the product (biological risk) or of substances in old containers (chemical risk).

The CER is used for cataloguing materials. These are 6 numerals that identify what then becomes waste to be disposed of or recovered for a new use. At the basis of this important regulatory tool is the list of waste GU L370/44 of 2014 and the CER classification system that allows us to differentiate them correctly, store them, treat them, and therefore effectively end their uncontrolled abandonment and diffusion. So a common language, a six-digit number to talk about waste with those who then have to deal with it. It is like a telephone number where the prefix indicates its origin (e.g. 20 **** – waste from separate rubbish collection) and the others (e.g. 200139 – plastic) the material as which it is recognised for recycling/reuse.

Assimilated municipal waste (AMW) (including the results of waste sorting)	EWC	Special non-dangerous waste (SW)	EWC
Packaging in mixed materials	15.01.06	Work clothing	15.02.03
Packaging in textiles	15.01.09	Rubber fenders,old tyres	16.01.03
Work clothing not contaminated by dangerous substances	15.02.03	Old equipment containing no dangerous components	16.02.14 20.01.30
Clothing	20.01.10	Jute sheeting	20.01.1
Textile products	20.01.11	Plastic sheeting	20.01.3
Bedding	20.03.99	Mooring cables	20.03.0
of which (RD)		Waxed sheeting	20.03.9
Packaging in paper and cardboard	15.01.01	of which (RAC)	
Packaging in plastic, clips, plastic hoops	15.01.02	Packaging in plastic, clips, plastic hoops	15.01.0
Packaging in wood	15.01.03	Wooden pallets	15.01.0
Packaging in metal, clips, metal hoops	15.01.02	Metal clips, metal hoops	15.01.04
Paper and cardboard	20.01.01	Wooden wedges, slats and planking	20.01.3
Glass, glass bottles	20.01.02	Netting in various materials for loading/unloading materials	20.03.09
Wooden pallets and boxes	20.02.38		
Plastic, plastic boxes, plastic bottles	20.01.39		

TRANSFER THE ATTENTION OF WORK AT SEA TO LAND

Good practices at sea need to be transferred to the landing at the quay. For the vast majority of the sector, the quay simply represents the place for landing and mooring the boat. In some ways it also works like this because of a matter of timing and resistance to fatigue. Unfortunately, speaking of the product chain and traceability, it is necessary to take into consideration the potential of the landing sites for guaranteeing the quality and profitability of the work carried out at sea. Transferring the value of work for a quality product to the quay means realising that different supply chains start from the quay and not necessarily only product chains. This means that, starting from traceability and giving them their proper weight in the field, other supply chains can find links with product control systems, including ones relating to professionalism and updating the capabilities of the sector, in the same way as the organisational commitment.





Starting well means thinking on the one hand about the development and implementation of the product landing, analysing the most critical components and seeking operational solutions through local knowledge and experience. A modern quay suitable for disembarkation must first of all be a coming together of experiences from other ports adapted to the food, waste and recycling chains. The basis of all these production processes is represented by the recording of what is landed, which is fundamental for building and consolidating the activities of the related activities and having the possibility of controlling the continuation of the supply chain. **Quayside organisation** has to take into account and complete the path followed by the LANDING OBLIGATION and SALVAMARE which complement the regulations, including that of the PORT PLANT FOR WASTE FROM SHIPS, on the subject. Working on the possible links between these regulations, rather than interpreting individual pieces separately, strengthens the potential the sector might exploit, also in terms of further employment prospects. **Following local demand, waste that can be used for bait** broadly follows the legislation on transformation and conservation similar to the more restrictive regulations on catering in general. Waste on land follows the transfer and deposit methods, where they exist, chosen by the municipal companies that also deal with their periodic disposal.





A solution to quay criticality involves the intersection of regulations and the local vision of the sector and not seeking to avoid such intersections. It establishes and, in a certain sense, consolidates the potential of a local phase to achieve minimum objectives of product enhancement and food safety. After the achievement of satisfactory minimum levels for the organisation of the product, a possible interconnection with equally important supply chains, that have reached levels of development and potential locally such as to be included in quayside solutions, can be considered. The relationships that are established between the different supply chains starting from the quay are based on an organisational work which from good control practices in the fishing areas, through onboard operations, is transmitted to the quay. Traceability begins precisely with the ability to mark with suitable documentation everything that is landed in order to resolve the discontinuities in the path that currently lead to critical issues and prevent connections in the sector to other supply chains.

A new organisational figure in the sector, furthermore identifiable among those who can already see strengths in the eternal critical issues of the sector and believe they can take the first important steps on the quay by:

- the adoption of the same traceability criteria adopted for the product and their fine-tuning, adapting the methods for waste and what is considered rubbish;
- particular attention to differentiated landings following local demand, also understood as the availability of existing supply chains to agree on integration and connection processes;
- the intended use of a product and the identification of the demand, to define priorities, traceability and possible alternatives to the current situation;
- good practices of using and having valid tracking tools for product recognition up to the first destination (and beyond);
- enhancing the secondary raw materials by creating a temporary waste deposit close to the landing point;
- raising awareness of a system based on local demand and availability which then has the possibility of being integrated as a node in a more extensive network capable of expanding demand over a wider territory.



Spread the system starting from local demand

to then search for nodes to bring together in the network.



Therefore also "bringing ashore" the good practices adopted at sea and aboard the boat means participating as protagonists in the development of the quay and providing it with the services needed to make the work done at sea productive, and so check if it is possible:

- to start a development process with the basic objective of the temporary storage of waste. This first phase simplifies the need for transport to larger delivery centres, but also favours the maintenance of fishing areas on less productive days, encouraged in this by activities integrated with production and quality products.
- to take responsibility for differentiated unloading, managing the procedures in terms of the law (e.g. documentation to direct the various treatments);
- to manage the different modes of storage with different containers, for example by separating the crates of fish from the bucket with organic, the "big bag" with a first differentiation;
- to take charge of the various uses that this new "hub" is able to develop over time.
- to adopt a separated waste collection system only after integration with other systems in place locally has been tried without success.

WASTE, RUBBISH, SCRAP, REGULATIONS

The legislation currently in force and the examples of implementation of the LAW OF PORTS 182/2003 and SALVAMARE LAW 1939/2019 seek solutions to the problem of the quay. Avoiding discards, but also controlling fishing areas, means preparing the conditions in port to effectively collect the catch by finding an adequate demand or chains to deal with the disposal thereof. Providing the conditions for an optimised landing also in terms of cleaning also involves a new perspective of the definition of waste where both what I fish and what I produce as waste of the day on board is equated to domestic waste. The SALVAMARE LAW speaks of domestic waste rather than special waste, so as to regulate in a less restrictive way what is recognisable as urban waste.





The ordinary maintenance of fishing areas is an activity that takes up again the habit of sorting onboard. The optimal product of this operation is the daily catch which is managed as a whole and sorted on the quay. Routine maintenance is based on a minimum quantity of approx. 10 kg per day, of which 4-5 kg is plastic. Differentiating this from the product is a relatively simple task and the quantities in line with Law 182/2003 do not require special notifications. Ordinary maintenance is a small start where the fleet should converge, being able to modulate and optimise supplies and, at the same time, adequately train the operators on the ground who are engaged in this service. The obligation to land, 1380/2013, referring to fish product, inevitably activates a synergy with other regulations, including legalised control extended to everything that is pulled up in the nets with the obligation to bring it ashore. Almost all guays are at least equipped with suitable separate waste containers, or at best, equipped as a temporary storage site where the waste is placed in big bags onboard and sent to the sorting centres via the most convenient and effective means. The logic is to make the most of the work done at sea in isolating the product from possible contaminants. Then in the end, bringing to land the rest as well that constantly feeds a service, ends up making these materials profitable as well, especially if accumulated every day (and differentiated) in a shared temporary storage area.

6



Extraordinary maintenance involves the detritus accumulation

areas. The interventions that seek to collect more waste than product have the aim of preventing its dispersion and the contamination of other areas used for fishing. They are therefore part of a new productive process that is very different from ordinary maintenance and occasional collection of waste and rubbish. It is important to identify these areas, but not to consider them as fishing areas. The sources of contamination, especially the lighter plastic detritus that can accumulate in the fishing areas, should be gradually eliminated. This should be considered as an alternative source of income. Only by connecting the landing with the nodes of a supply chain that starts from the quay, such as the one that leads to the sorting of waste, can the profitability of a trip to sea be increased, as well as the employment linked to the collection through the development and strengthening of ancillary services.

Therefore consolidating activities on the quay means having built an instrument, a whole that is capable of guaranteeing a series of services which will then be integrated with other situations. The landing then becomes a response to the demand for secondary raw materials. No longer sporadic initiatives that end at the quay, but campaigns conducted by groups of professionals both at sea and on land to make these operations effective in the indirect cleaning of fishing areas.

6



WASTE AND RUBBISH OR RESOURCE AND SECONDARY RAW MATERIAL

By eliminating discarding, onboard work is optimised by reducing the waste of collecting scraps and waste and then dumping them at sea. Improving the quality of work onboard simply means eliminating a useless phase of production which, among other things, also causes self-pollution in the fishing area. The quay therefore becomes necessarily the place to land with prospects of productivity and income, of product differentiated into waste, rubbish from the fishing areas, as well as of course the product fished with quality work in the entire chain under control.

The strengthening phases therefore go in the following directions:

- traceability from sea to landing starting from the product up to the most productive waste;
- quay demand by adapting its organisation to the different types of market;
- offer managed by quayside logistics with professional figures from the fishing sector;
- connection between quays by extending the network, optimising supply and demand.

The activation, organisation and enhancement would develop further production flows, initially oriented locally, then going on to feed flows in and out (and to and from) other quay products. The need for the obligation to land, but also for an optimisation of labour, pushes in the direction of waste recovery policies. Waste can feed an activity linked to the production of bait or a special supply from feed to raw materials for protein substances (e.g. chitin or collagen). The pilot initiatives undertaken constitute the path on which other production flows then develop, passing on to the treatment of other materials obtained from the catch and landed on the quay.







The logistics of the quay therefore become central. The landing of differentiated products is one of the main elements, but enhanced by the other roles which then generate local flows and connections with other production nodes. Until now, those who go fishing have never abandoned the role-playing game that saw them daily throwing the dice that assigned them a fishing area, a favourable day, a productive zone.

Expanding the playing field means that everything is transformed,

increasing the roles, but at the same time, with the appropriate knowledge and professionalism to be acquired, the game is won no longer with dice and fate, but by positioning themselves directly on the correct and more convenient squares by relying on experience and diversifying their work from only onboard by "jumping" to land.

Self-assessments and practical **test exercises on fishing areas**

Chap.1

Plastics self-assessment exercise:

list the plastics, other materials on board and those that I use for work clothing/indicate possible alternative materials and those that were used in the past. Try to estimate the consumption, e.g. 1 - more than 2 years of use, 2 - up to 10 years of use, 3 - more than 10 years of use.

Chap.2

and the set of the set

open specimens of fish (e.g. 1 or 2 anchovies per box) or 1 specimen/20 per species and place the digestive tract in a transparent bag. Use the fingers to squeeze externally and hold up to the light to see if there are plastic fragments.

😂 🎶 Self-assessment exercise on fishing grounds:

using an annual calendar, try to estimate the most favourable fishing days, the minimum discards per haul, and the most "contaminated" areas.

Chap.3

Self-assessment exercise on waste:

place a big bag (1m³) at the stern and note its filling by weighing the detritus. Report the average quantities of product and waste for daily hauls. Select plastics directly from the rest, identifying their main components and presumed origin.

😂 加 😂 Self-assessment exercise on fishing grounds:

classify fishing areas with a score from 1 to 3 referring to the presence of detritus and waste. Estimate the proportion (by weight and/or size) of the components of the waste compared to the catch. The data per boat has to be "multiplied" by the fleet and trades.

select the waste onboard using the most frequent and least problematic EWC codes. Then verify the existence near the landing site of ecological oases and systems for the transfer and disposal of the types listed.

Chap.5

🔊 🔊 / Quayside self-assessment exercise:

assess the effectiveness of the service on land with respect to the (average) needs from the data in ch. 3. List land services, then verify the existence of ecological oases, temporary storage sites and delivery and disposal systems.

Chap.6 Self-assessment exercise on waste:

on a map (or using Google Maps) insert the accumulation areas detected over the years and the fishing areas according to trades or fleets. Identify the sources of waste and its movements.

Chap.7

evaluate the production of waste deriving from the extraordinary maintenance of the areas and the contribution of ordinary maintenance by simulating the activities of refuelling (e.g. compaction) and the production of secondary products (e.g. pyrolysis plant) such as fuels, and/or polymers by objects.

Useful materials for consultation **and reference**

Roberto ODORICO et al. - 2019 – *IL NOSTRO MARE LO SALVI CHI PUÒ Il contributo dei pescatori per arginare l'inquinamento da macro e microplastiche* – Progetto Pesca CGIL FLAI, edizione FLAI CGIL, 147pp

SALVAMARE Law https://temi.camera.it/leg18/provvedimento/legge-salva-mare.html

LANDING OBLIGATION Law – REG 1380/2013

https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=CELEX:32020R0123& from=IT

Port facilities law, waste produced by ships and cargo residues – Lg. 182/2003 www.ambientediritto.it/Legislazione/Rifiuti/2003/dlgs%202003%20n.182.htm

FINE VITA RIFIUTI (End of Waste) Law - Lg. 128/19

https://www.gazzettaufficiale.it/eli/id/2019/11/02/19G00137/sg

EDIZIONE FLAI CGIL.

PRINTED SEPTEMBER 2020. TIPOGRAFIA OSTIENSE, ROME. GRAPHIC DESIGN STUDIO ROVIGLIONI, ROME.

PROGETTO PESCA FLAI CGIL

Roma 00153 - Via Leopoldo Serra, 31 Tel. +39 06585611 - Fax +39 0658561334 e-mail: progettopesca@flai.it www.progettopescaflai.it