

Water Pollution with Plastic - Scenarios Aimed at International Promotion through Pedagogy and Thematic Philately

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Abstract: *Water pollution with plastic waste continues to be one of the biggest environmental problems of the modern world. Its impact is not only significantly negative but also materialized long-term repercussions, affecting the dynamics of marine life and the development of tourist activities. Beyond the various scenarios regarding the long-term sustainability of some measures and solutions, an impressive effort must be made to reduce and prevent other situations of a similar nature. In this sense, we sought to identify if there are solutions aimed at promoting work scenarios in the case of water pollution with plastic waste. What we noticed, are several philatelic effects (postage stamps, first-day covers/FDCs, envelopes and blocks, illustrated postcards, maximum postcards) that have appeared in the last 7-10 years, internationally, most being intended to emphasize and impose the (re)adaptation of scenarios to fight against pollution. Consequently, it matters not only what we propose to do, but also what each of us can do; or in this case, promoting the problems faced by the environment, and their associated solutions, are a niche that deserves more attention.*

Keywords: *Water pollution, plastics, thematic philately, international promotion*

1. Introduction

Water pollution with plastic waste continues to be, according to the latest report issued by the Ellen MacArthur Foundation [1] and circular economy specialists, one of the biggest environmental problems of the modern world. It is found globally from deserts to farms, tropical landfills, and arctic snow, as well as from mountaintops to the deep ocean, where it has become a major threat to aquatic environments [2].

Reports of plastic debris in the marine environment began many years ago, with plastic pollution continuing to build up over the past 50 years. Estimates of global emissions of plastic waste to rivers, lakes, seas, and oceans range from 9 to 23 million t/year [3], with a similar amount emitted. Furthermore, plastic in seas and oceans can kill marine animals (turtles, dolphins, and whales) by suffocating or blocking their digestive system. Plastic can also pollute beaches and affect tourism, an important source of income for many countries. Therefore, we agree that its impact is not only significantly negative but also with tangible repercussions over time, affecting the dynamics of marine life and tourist activities.

Water pollution with plastic waste is mainly caused by human activities, such as dumping waste in oceans or on river banks, the use of single-use plastic products, and the accidental loss of plastic from ships or oil rigs. Waste treatment methods such as incineration or improper storage also contribute to all of this. There are many proposed solutions to tackle the problem of water pollution with plastic waste. One of these is represented by reducing the use of single-use plastics, by promoting sustainable alternatives, such as biodegradable or reusable products.

At the same time, there must be better waste management, to reduce its dumping in the oceans and on the banks of rivers. Equally important is the involvement of all actors, from consumers and

industry to governments and international organizations, to promote concrete actions to prevent and reduce water pollution with plastic.

As such, aligning with this approach, through this paper, we will try to explore the impact of plastic water pollution, the causes of this problem, and the proposed solutions to address this global problem. Thus, we noticed that in recent years, many countries around the world have issued postage stamps related to plastic water pollution. These postage stamps were designed to draw attention to this global issue and promote awareness and action. Some stamps issued featured images of marine animals that have been affected by plastic pollution, such as turtles and whales, and others featured images of plastic-filled oceans or strong messages to promote the reduction of single-use plastic use.

2. Material and methods

The initiative to identify materials with a philatelic character started from an article published in a specialized blog in the field, namely "Jurnalul Philatelic"/Philatelic Journal 0. Starting from this, to identify the pieces in question, we turned to a series of sites, with philatelic specifics, on the list of which we can find Colnect®, Delcampe®, Okazii®, eBay®, WOPA+®, etc.

The indexing, analysis, and description of the identified pieces were carried out step by step, starting from the data provided by the Colnect® and Delcampe® sites, to which were added the data published by the postal administrations. Following the identification of the philatelic pieces in the topic addressed, due to the large number of results, we applied the following selection criteria, which can equally be criteria with a pedagogical effect:

- *thematic relevance*: the philatelic materials should properly address issues related to plastic water pollution, providing information or awareness about this global problem;
- *design quality*: the visual aspect of the philatelic issue must be attractive and highlight the visual impact of plastic pollution on the aquatic environment;
- *Innovation, novelty, and originality of the exhibition*: the philatelic materials that bring innovative elements or original approaches to the theme will be considered to highlight the creativity and impact of the message;
- *educational content*: the philatelic materials should provide educational information on the effects of plastic pollution on aquatic ecosystems and potential solutions for this problem;
- *connection with other current events*: if the philatelic issue correlates with current events or awareness campaigns regarding plastic pollution, it can be evaluated positively;
- *representation of diversity*: the philatelic materials should reflect the diversity of species affected by pollution and convey a comprehensive message regarding the need to protect the environment;
- *the effectiveness of the message transmitted*: the philatelic materials must clearly and effectively communicate the message regarding the negative impact of plastic pollution on waters;
- *availability of information*: the philatelic materials should be accompanied by additional information or descriptions that provide context and details about the problem of plastic pollution and efforts to combat it;
- *quality of philatelic material*: the use of quality materials for philatelic issues (eg sustainable paper or other recyclable materials), can be an additional selection factor.

These criteria have decisively contributed to the selection and promotion of the identified philatelic issues, which successfully address the problem of plastic water pollution, equally drawing attention to scenarios with possible negative impacts.

3. Results and discussions

Plastic, ubiquitous in everyday life, constitutes a significant part of our living environment. This versatile and durable material has become an essential component of modern society, being used in a variety of products, from packaging and household utensils to components of electronic devices and medical equipments. However, the excessive presence of plastic in our environment can cause significant problems.

Plastic waste poses a threat to terrestrial and aquatic ecosystems, affecting biodiversity and water quality. Plastic can persist in the environment for long periods, contributing to long-term pollution. Plastic fragmentation is a growing problem with the potential to affect human health and ecosystems. Awareness of the negative impact of plastic on the environment has increased in recent years, leading to sustained efforts to reduce the use of single-use plastic, promote recycling, and develop more sustainable alternatives. Education and individual and collective action are essential to reduce plastic pollution and protect the environment for future generations.

3.1 Pollution: plastic in the oceans, 31.08.2012, Republic of Burundi

Commemorative philatelic issue "Pollution: Plastic in the Oceans" (indexed by Mi BI#2590..93KB, Sn #BI-1115..18, Bel #BI-BL321) 0, consisting of four multi-colored comb lace stamps 13½, printed by offset lithography and arranged in the miniature school in Fig. 1, with the nominal value of 8,140 FBu (Burundian francs), very well captures this current environmental problem. Along with them appears the note whose stamp has a nominal value of 7,500 FBu.

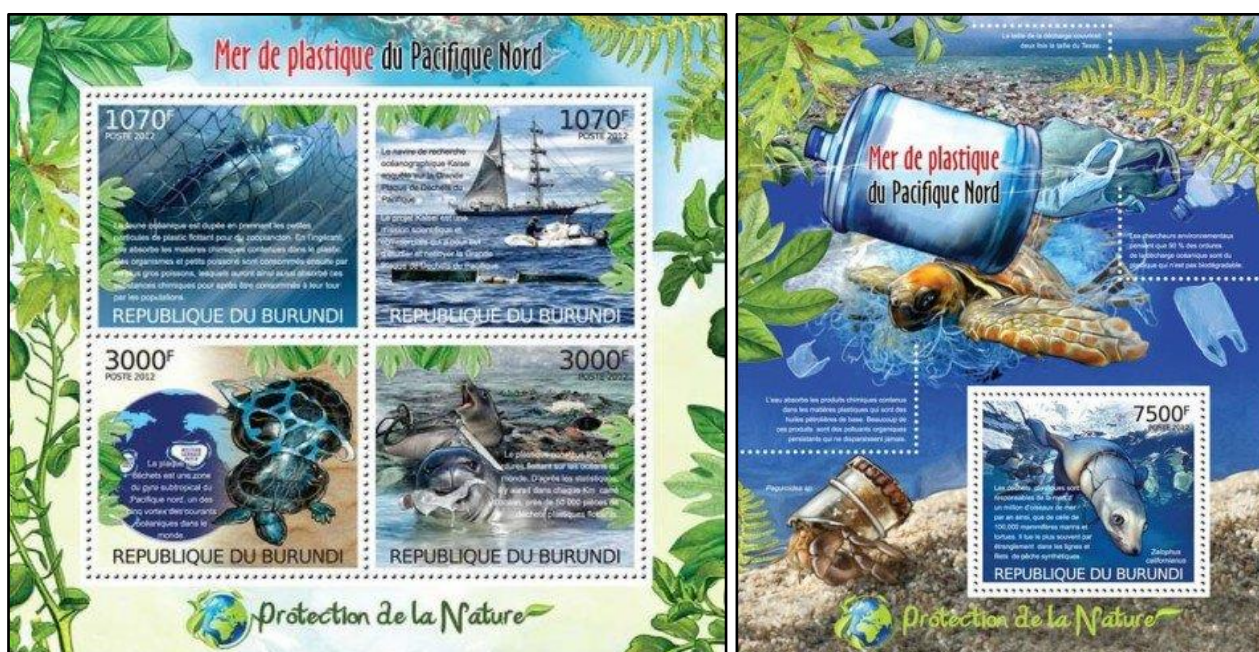


Fig. 1. Minisheet and sheet of the philatelic issue "Pollution: plastic in the oceans", 31.08.2012, Republic of Burundi 0

The first two stamps, with a face value of 1,070 francs each, highlight the circuit of plastic in the food chain and the importance of the Kaisei project in its effort to clean up the Pacific 0. The project in question aims to remedy situations where ocean fauna falls into the trap of ingesting small plastic particles, often mistaking them for zooplankton. By consuming these particles, aquatic organisms absorb the chemicals contained in the plastic and are then consumed by larger specimens, which accumulate these chemicals. Eventually, the accumulated chemicals become part of the human food chain.

Oceanographic research vessel Kaisei focuses on the study of the Great Pacific Debris Field (MCDP). Launched in 2009, the Kaisei project is a complex mission with dual scientific and commercial goals, aiming at the research and cleanup of MCDP 0. The ship is actively involved in the research and analysis of this vast area of the ocean where significant amounts of plastic waste accumulate. The crew and equipment on the ship are ready to contribute to efforts to clean the oceans of plastic pollution.

The Kaisei project explores and implements innovative technologies for efficient waste management. In addition to research and cleanup activities, the Kaisei Ship has a crucial role in informing and educating the public about the impact of plastic waste on the marine environment. Kaisei's project works in close collaboration with other organizations, institutions, and researchers globally to address the complex issue of marine litter.

The next two stamps in the block, with face values of 3,000 francs, illustrate aspects of the impact of plastic on marine life - effectively remaining captive. Plaques of plastic debris tend to form in the subtropical areas of the North Pacific, where one of the world's five ocean currents eddies originates. Plastic constitutes 90% of the total floating waste in the world's oceans.

According to statistical data from 2012, it is estimated that for every square kilometer of ocean, there are approx. 50,000 pieces of floating plastic waste. They are responsible for the death of over a million birds each year, as well as approx. 100,000 deaths among marine mammals and turtles (eg, by strangulation in the mesh of synthetic fishing nets). This is also highlighted on the stamp of the 7,500-franc note, which shows a young California sea lion (*Zalophus californianus*) captive in an ocean fishing net 0.

3.2 World Environment Day - Fight Plastic Pollution 05.06.2018, India

The "World Environment Day" commemorative philatelic issue, appearing under the motto "Fight plastic pollution" (Fig. 2), was put into circulation on 06.05.2018 in the form of a block (142 x 105 mm) of four multicolored stamps. Modeled by graphic artist Suresh Kumar, the four stamps (Mi #IN-3394..97, Yt #IN-3083..86, Sg #3502..05) 0, have a face value of 5 rupees, dimensions of 39 x 29 mm, and the lace of 13¼ x 13¼ units.



Fig. 2. Official FDC of the philatelic issue "World Environment Day – Fight against plastic pollution", franked with all four postage stamps and canceled with a special stamp, 05.06.2018, New Delhi (India) 0



Fig. 3. Special envelope made under the slogan "Fight against plastic pollution", stamped with one of the postage stamps of the philatelic issue "World Environment Day - Fight against Plastic Pollution" and canceled with the special stamp of the Philatelic Exhibition "Bilasapex 2019", 02.01.2019, Bilaspur (India) 0

The image of the stamps brings to our attention the presence of plastic waste in our everyday life, these being captured alongside runners on the beach (on the green stamp), by those who hike in the forest (on the blue stamp), by couples practicing yoga by the rivers (on yellow stamp) and even families with children playing on the beach (on the purple stamp) (as presented in Fig. 3).

3.3 MERCOSUR 2019: Environment protection, 05.06.2019, Uruguay

A new commemorative issue entitled "MERCOSUR 2019: Environmental Protection" (Mi #UY-3659, Yt #UY-2948, WADP-WNS #UY-025.19) 0 saw the light of day at the administrations of Uruguay on 05.06.2019.



Fig. 4. Official FDC of the philatelic issue "MERCOSUR 2019: Environmental Protection", postmarked and canceled with a special stamp, 05.06.2019, Uruguay 0

The campaign against plastic pollution is also the theme of this issue (see Fig. 4), which is captured through the multicolored postage stamp, in format 42 x 30 mm with comb lace 12½, a turtle fighting for its survival with a plastic bag. The design of the piece with the nominal value of \$65 (Uruguayan peso) belongs to the graphic artist Alvaro Rodriguez, it was printed by offset lithography at Sanfer SRL in a limited edition of only 15,003 copies.

3.4 Campaign against plastic pollution, 29.09.2020, Morocco

The commemorative philatelic issue "Campaign against plastic pollution", with the theme of environmental protection, appeared on 29.09.2020, consisting of four multi-colored postage stamps, in 41 x 30 mm format, with syncopated lacing 13¼. The printing of postage stamps with the face value of 3.75 د.م (Moroccan dirham) was done by offset lithography, and indexed in catalogs Mi #MA-2043..46, Sn #MA-1289a-d, Yt #MA-1887 ..90 and WAD #MA008..11.20 (see Fig. 5) 0.

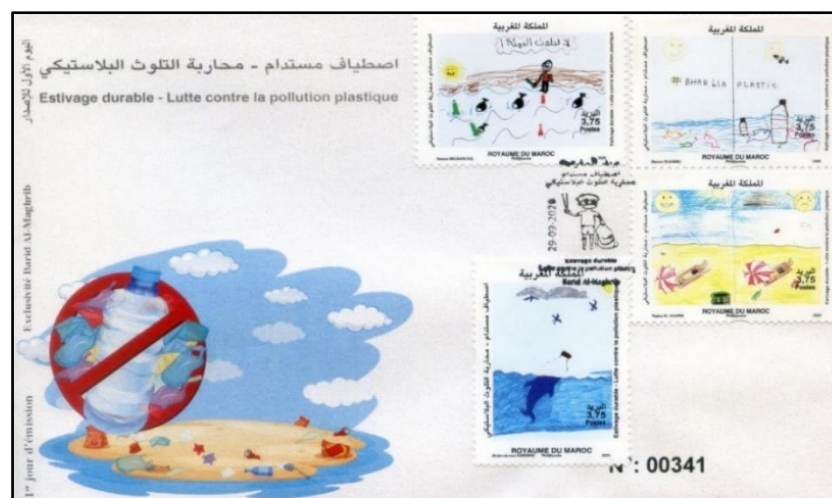


Fig. 5. Official FDC of the philatelic issue "Campaign against Plastic Pollution", franked with all four postage stamps and canceled with a special stamp, 29.09.2020, Morocco 0

Plastics floating on the surface of the waters may seem bright in their playful movement, but when these little explorers discover that those objects are waste that can injure and poison sea creatures, the initial amazement turns to deep sadness and disgust. Through their eyes, marine life suffocated under the weight of plastic waste becomes a disturbing story that motivates them to get involved. By nature, they feel the need to protect the world and as a result become messengers of innocence and responsibility, reminding us to protect resources for future generations.

3.5 Campaign against Plastic Pollution in the Oceans, 20.02.2023, Cook Islands

The commemorative philatelic issue "Campaign against plastic pollution in the oceans", having as its theme the protection of marine life, appeared on 20.02.2023, also consisting of four multicolored postage stamps, with lace $13\frac{1}{2} \times 13\frac{1}{4}$ 0. The \$1 (NZD) face value postage stamps were printed by offset lithography, indexed to Yt #CK-1892..95.

The postage stamps franking the FDC in Fig. 6 0-0, show a whale, a crab, a dolphin, and a turtle in the company of several categories of plastic waste. It was not by chance that these animals were chosen to illustrate the stamps of this philatelic issue. Some marine species, such as whales and dolphins, may mistake plastic fragments for their natural food, such as squid or fish. This can lead to accidental ingestion of plastic waste, which can have serious consequences for their digestive system, general health, and even their survival. Plastic waste such as plastic bags and fragments can become death traps for whales, dolphins, and other species; animals can become trapped or drown with these objects, leading to mortality and significantly affecting population dynamics.



Fig. 6. Official FDC of the philatelic issue "Campaign against plastic pollution in the oceans", 20.02.2023, Cook Islands 0-0

Plastic pollution can affect the natural habitat of marine species such as coral reefs, mangroves, and others. This indirect impact can lead to loss of food, and shelter, and changes in their ecosystems, affecting the entire food web. Plastic waste can carry toxic chemicals and pathogens that can affect the health of marine species. In addition, plastic fragments can act as vectors, spreading pollution throughout the food chain and into different marine habitats.

Plastic can also affect the reproductive processes of marine species. Chemicals released by plastic or absorbed by marine animals can interfere with their hormone systems and affect the normal development of eggs and chicks. To protect these vulnerable species, efforts to reduce plastic pollution, promote recycling, and adopt sustainable practices are essential. Public awareness and active involvement in protecting the marine environment are crucial to ensuring the health and survival of these species.

3.6 Campaign against Plastic Pollution in the Seas, 20.04.2023, Croatia

Another philatelic issue dedicated to the theme of environmental protection is the one entitled "Campaign against plastic pollution in the seas" (Yt #HR1485, WADP-WNS #HR0.19.23, #HR1439), consisting of a single multicolored postage stamp, in the 42.75 format *35.5 mm with lace 14, appeared on 20.04.2023 (for more details see Fig. 7) 0. The design belongs to Enea Knežević, being printed by offset lithography with the support of Agencija Za Komercijalnu Djelatnost, with a face value of €1.14 (Euro) in a print run of 30,000 copies.

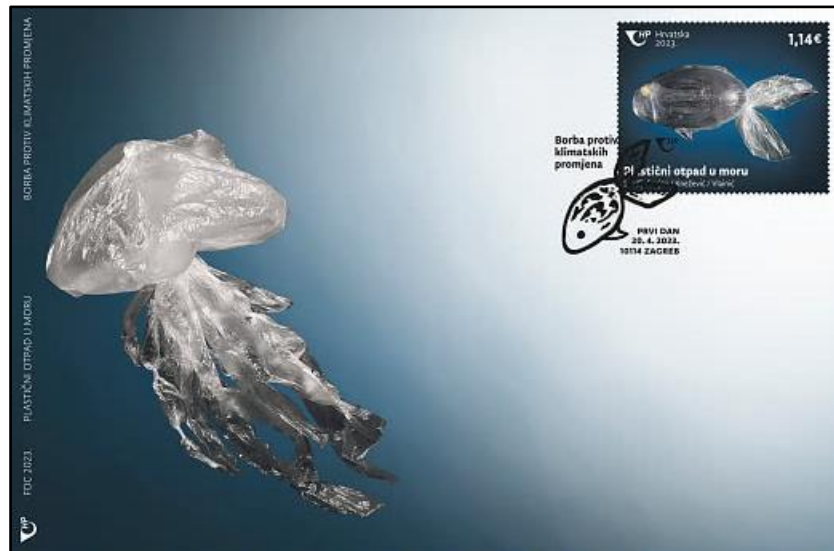


Fig. 7. Official FDC of the philatelic issue "Campaign against plastic pollution in the seas", 20.04.2023, Croatia 0-0

The serious and alarming threat of plastic suffocation of marine life stems from the excessive amount of plastic waste in the oceans and seas, directly and indirectly affecting marine life in multiple ways. Solving this problem requires concerted global efforts to reduce plastic production and use, promote recycling, and actively participate in cleanup and marine pollution prevention actions. Awareness and action also taken by postal administrations that circulate philatelic issues on the theme of plastic pollution of the seas and oceans are essential to protect the marine environment and ensure a future for these vulnerable species.

3.7 World Environment Day, 31.07.2023, Mali

The campaign against plastic pollution in the world's seas and oceans is also the theme of the 100-franc stamp from the "World Environment Day 2023" issue put into circulation by the Postal Administration of Mali on July 31, 2023 (for more details see Fig. 8) 0. The stamp wants to emphasize that turtles are heavily affected by plastic pollution and the impact on these vulnerable creatures is significant. Especially those that feed near the surface of the water, they may mistake plastic fragments for their natural food, such as jellyfish or other small marine organisms. Accidental ingestion of plastic can lead to obstruction of the digestive tract, which in turn can cause injury, illness, and even death.

Plastic waste, such as abandoned fishing nets or lost fishing gear, can become traps for turtles. They can very easily become entangled in these objects, leading to distress and the inability to feed or move normally.

Plastic pollution also affects turtles' natural habitat (e.g., nesting beaches). The presence of litter can disrupt nesting and egg-hatching processes, and plastic fragments can create obstacles that prevent chicks from accessing water. Plastic often contains toxic chemicals that can be released into the water. This can have negative effects on health and reproduction, affecting the entire life cycle of marine life. Plastic pollution is contributing to the decline of turtle populations, which are already suffering from other threats (eg, habitat loss due to climate change).



Fig. 8. Official FDCs of the "World Environment Day" philatelic issue, stamped with a philatelic sheet and associated block, 31.07.2023, Mali 0,0

4. Conclusions

Plastic water pollution is a significant global problem with negative impacts on the environment and marine life. This situation is mainly generated by human activities and can be addressed by reducing the use of single-use plastic, more efficient waste management, and the involvement of all actors. Action must be taken now to protect our planet and ensure a sustainable future for future generations.

Pedagogy through various educational alternatives, in which thematic philately can be used as a working tool (in teaching-learning-evaluation), can be a new way of promotion among young people. Besides, thematic philately also remains in the current research context an effective way to convey messages with a deep emotional impact, thus contributing to the promotion of awareness even at the international level. Both benchmarks, pedagogy, and thematic philately, can encourage today's society to act promptly and effectively to save marine habitats and species, assuring future generations the chance to enjoy them. In addition, they can accelerate and sustain the motivation of decision-makers, both in managing plastic waste situations and in saving and conserving marine species and habitats.

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Annexes



Fig. 9. Various FDCs for Philatelic Issue "World Environment Day - Fight Plastic Pollution", 06/05/2018, New Delhi/Kanpur/Jabalpur (India) 0-0

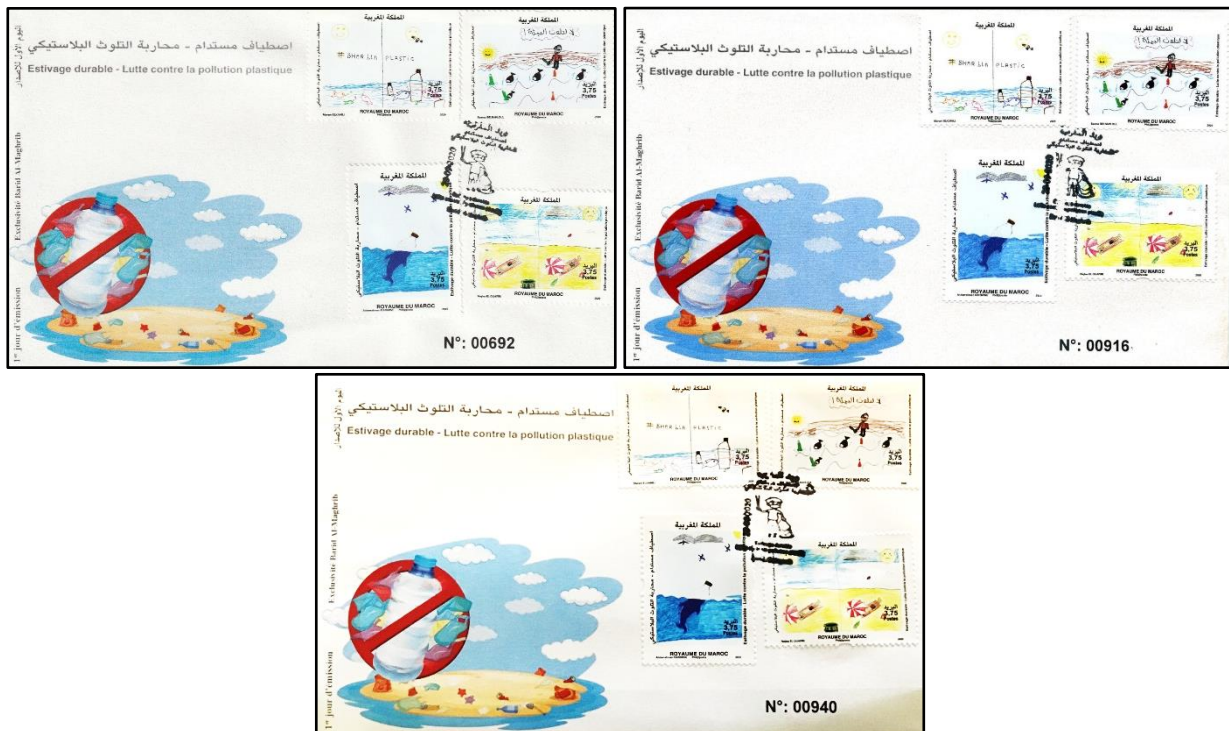


Fig. 10. Official FDC of the philatelic issue "Campaign Against Plastic Pollution", franked with all four postage stamps and canceled with a special stamp, 29.09.2020, Morocco 0-0