

Final Report

FESOR Don Bosco

An innovative and replicable training strategy to strengthen expertise and entrepreneurial capacities for integrated solid waste management in Colombia



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1. Summary

Based on the environmental purposes of the Salesian community of Don Bosco in Colombia, Switzerland and the rest of the world, the FESOR Don Bosco project (2022-2025) provided an opportunity to strengthen actions related to the sustainable management of solid waste in general, and Waste Electrical and Electronic Equipment (WEEE) and organic waste in particular. In compliance with the principles of Don Bosco, the courses and strategies developed with the project aimed at increasing the opportunities for labour inclusion and entrepreneurship in these sectors which, in Colombia and in Latin America and the Caribbean, are in growing demand for young people with technical and social skills that allow them to respond to the sustainability objectives of the country and the region.

Based on the holistic approach that the concept of Integral Ecology formulated by Pope Francis in his Encyclical *Laudato Si*, and in the search for the care of the Common Home that it proposes, the aim was to strengthen the sustainability actions that the participating institutions were already carrying out when the project was conceived in 2021. To this end, an interdisciplinary team was formed that involved managers, administrative staff, teachers and students from 9 training institutions in Colombia, which was accompanied by experts in the thematic areas of waste and the circular economy from Ecopartner Switzerland and Colombia and FiBL, Switzerland. Thus, based on the concepts provided by the group of experts in each area, 3 courses were developed with a participatory approach: Integrated Solid Waste Management (ISWM), WEEE Management (with a focus on reconditioning and manual disassembly of equipment), and Management of Organic Waste (with a focus on composting and organic agriculture). Through developing and implementing practical learning environments that simulate fundamental aspects of the management and treatment of each type of waste, the courses became a practical emphasis. They were based on the fundamental theoretical concepts in these areas, on the Salesian principles of Don Bosco and on the circular economy as a current paradigm. To promote job creation, the contents included the provisions of the related Sectoral Standards of Labour Competencies, issued by the SENA (National Apprenticeship Service) in Colombia.

The “Jugendhilfe Weltweit Don Bosco” of Switzerland and the Inspectorate of Bogotá will continue to support the regular implementation of the modules designed in the 3 pilot institutions, CDB, CJBO and ITAV¹, and the replication of the tools in 5 other institutions that participated in the trainings and curricular designs. It will also continue to lead the dissemination of FESOR in other Salesian institutions in Colombia and in the region to promote its replication. To increase the success of this multiplication, FESOR Don Bosco also included work to strengthen the CFP (Vocational Training Centre) America and CFP Colombia networks, based on a self-evaluation process facilitated by Skat Foundation of Switzerland. Both the Salesian institutions involved and Ecopartner have also identified opportunities for scaling up the FESOR Don Bosco model, which would include the development of new complementary courses, the achievement of recognition of a Technical Labour Training Program in Colombia, and the replication of the model in other countries in the region with similar problems and opportunities.

2. Starting Point

In recent years, authorities in several Colombian cities and municipalities have initiated the implementation of different strategies to increase sustainability in the management of municipal solid waste, particularly organic waste and WEEE. However, collection, transport and recovery systems are still under development, and bad practices by consumers and informal recycling are still evident. In general, better technical capacities are needed to meet the challenges of sustainable management framed by concepts such as the circular economy. Therefore, technicians and professionals trained in the country's different educational institutions must strengthen their knowledge and skills to join selective collection, transformation and use programs for different types of waste. Consequently, educational institutions play an important role in influencing environmental education and civic awareness.

¹ Don Bosco Centre (Centro Don Bosco, CDB), Juan Bosco Obrero Centre (Centro Juan Bosco Obrero, CJBO), and Salesian Agricultural Technical Institute in Valsálice (Instituto Técnico Agrícola Salesiano de Valsálice, ITAV)

The Salesians of Don Bosco are one of the largest Catholic congregations in the world and their pastoral action is based on an understanding of the needs of young people and popular circles, especially the most vulnerable. In the Colombian context, the Salesians are organized in two provinces: Bogotá (COB) and Medellín (COM). This project was developed with technical educational institutions in the San Pedro Claver province of Bogotá, whose educational institutions have been developing environmental actions in line with the Sustainable Development Goals and the postulates of Pope Francis' encyclical *Laudato Sí*. The aim is to provide solutions, especially in relation to the efficient use of resources such as water and energy. However, in 2019 the need was identified to strengthen environmental education related to solid waste management at the institutional level through pedagogical strategies that promote the development of environmental projects and sustainability initiatives.

Members of the team of experts from the Swiss organizations have previously led projects supported by Repic, related to the strengthening of organics management and composting in Pérez Zeledón, Costa Rica, and the implementation of a WEEE recycling plant in Cuenca, Ecuador. Thus, FESOR Don Bosco became a relevant opportunity to multiply the results of these projects and promote the strengthening of knowledge networks at the Latin American level. The learning achieved in all these projects will be used in the FE-SOR Don Bosco Development.

3. Objectives

Based upon the context described as starting point above, the **general objective** of the FE-SOR Don Bosco project was to strengthen young people's environmental care skills and related labour competencies through the development of an innovative and replicable training strategy on sustainable solid waste management in general, and organic waste and waste electrical and electronic equipment (WEEE) in particular, using three Salesian educational institutions of Don Bosco in Colombia as a pilot project.

This included the following **specific objectives**:

- Strengthening institutional and training strategies related to increasing the sustainability of waste management as part of the care of the Common House as part of Salesian values and principles.
- Strengthening of environmental responsibility skills and labour competences related to waste management in students and teachers.
- Strengthening of the Salesian network

4. Project Review

4.1. Project Implementation

Empowerment: Developing a participatory curriculum design methodology

To achieve a local empowerment of the courses, not only the teachers of the different institutions were involved, but also the administrative staff at the level of the Salesian Inspectorate of Bogotá. Thus, those responsible for the training processes and the Inspectorial Environmental Management system led the process locally, convened the different activities, and participated in the trainings. The process was divided into 4 phases of curriculum design, as follows:

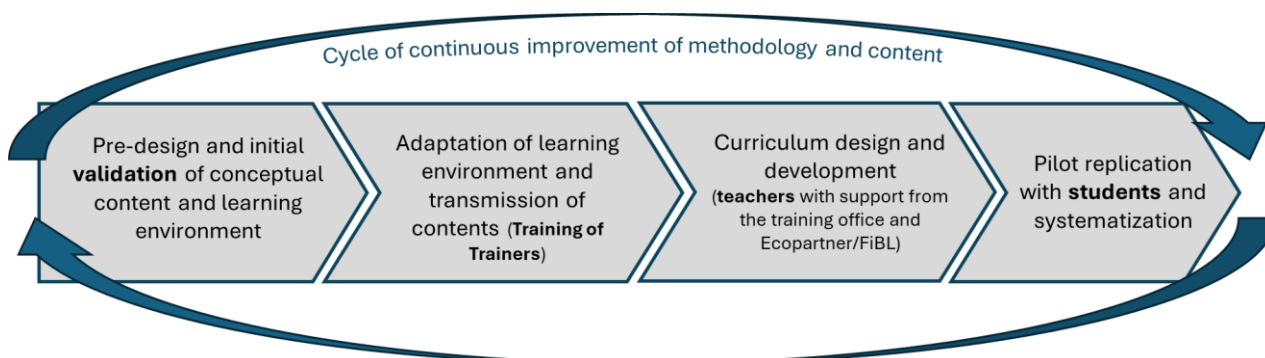


Figure 5.1. Participatory curriculum design process (Source: Ecopartner)

Both, the conceptual inputs and the design of the practical learning environments were designed by the expert teams of the Swiss organizations. The local team of teachers and administrative staff participated in validating their adaptability to the institutional and training context and received technical support during the design of the curricular pedagogical tools and their pilot implementation with students.

Institutional heterogeneity and potential for replication

The project was initially planned with the involvement of 3 educational institutions: Don Bosco Centre (Centro Don Bosco, CDB) and Juan Bosco Obrero Centre (Centro Juan Bosco Obrero, CJBO) in Bogotá, and Salesian Agricultural Technical Institute in Valsálíce (Instituto Técnico Agrícola Salesiano de Valsálíce, ITAV) in Fusagasugá, Cundinamarca. However, to strengthen the participatory process of curriculum design, 5 other institutions from different departments of the country were invited to participate in the modules as shown in the following diagram:

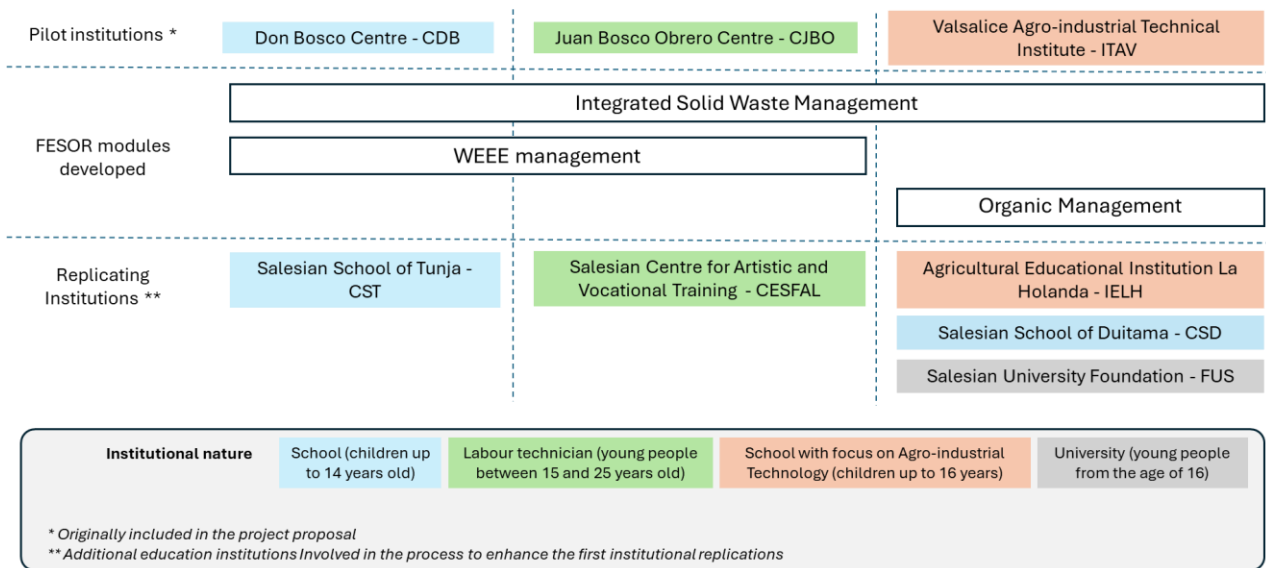


Figure 5.2. Salesian Don Bosco educational institutions involved in the project.

In addition, with the aim to reflect a larger territorial and cultural scope than initially planned, the 8 institutions that participated in the project offered heterogeneity not only on a territorial and cultural scale, but also in relation to the organizational nature and target audience in each (see figure above).

This fact enhances the replicability of the project within the country in the short term. This variety enhances the replicability of the FESOR Don Bosco model, thanks to its adaptability to different contexts and educational organizations serving students of a wide range of ages, backgrounds and work orientations.



Figure 5.3. Location of institutions involved (Source: Ecopartner)

4.2. Achievements of Objectives and Results

Courses: Contents and learning environments.

Each of the courses developed has a strong conceptual basis provided by the experts, which also reflects the knowledge of the lecturers. The learning units start with a holistic and sustainable view of management at the macro level and subsequently develop operational and utilization specificities. For each module, comprehensive collection of supporting material for academic activities was compiled, including specific national and international legislation and regulations, guides, games and multimedia activities.

Integral Solid Waste Management	Integrated WEEE Management	Integrated organics management & Composting
1. Negative Impacts of Improper Solid Waste Management and the Importance of Good Practices	1. Basic concepts of integrated WEEE management	1. Overview of integrated municipal organic waste management
2. Systemic approach and paradigms in solid waste management	2. Regulatory and legislative aspects of integrated management and handling of WEEE	2. Composting: Biology and initial plant stages
3. Overview of Integrated and Sustainable Management	3. Treatment of WEEE	3. Composting: Operation, process control and product production
4. Operational aspects of SWM management	4. Recovery, recovery and final disposal of WEEE	4. Quality of organic matter treatment products and their application on crops
Anexo: Kit de actividades y herramientas no-virtuales y digitales		

Figure 5.4. Structure and contents of the three designed courses

The resulting sessions, activities and pedagogical tools were condensed in an institutional Google site, so that teachers have the material available to use with their students, according to the formative purposes sought.



Figure 5.5. Interface of the website developed by and for teachers, with the conceptual inputs provided by Ecopartner and FiBL for the replication of the courses.

The learning environment is a physical space with a learning-by-doing training purpose, including user guides, protocols and academic activities, so that both theory and practice are taught there. Through the training of trainers, it was demonstrated how this strategy enables the empirical application of the main work competences indicated in the specific NSCL for each case. Thus, the SWM space promotes the correct separation at source according to the Colombian colour code. It has equipment to characterize a sample of waste by the method of quartering, establishing the percentages of the fractions that make up.



Figure 5.6. Learning environment of the Integrated Solid Waste Management (SWM) course, and its use during the training of trainers in the CBD, Bogotá (Source: FESOR Don Bosco Team).

Based on the legislation, in the case of WEEE, the learning environment simulates a real plant with areas for equipment reception, reconditioning, manual disassembly and parts storage.



Figure 5.7. Learning environment of the course on Integrated Management of Waste Electrical and Electronic Equipment (WEEE), and its use during the training of trainers at the CJBO, Bogotá (Source: FESOR Don Bosco Team).

The course on organics and composting has as its main environment the learning of the closed cycle between organic waste, compost production and its application in agriculture. This space is distributed in different parts of the campus, allowing for a small composting and vermiculture plant, and spaces for experimentation with different crops.



Figure 5.8. Learning environment I of the Integrated Management of Organic Waste and Composting course, and its use during the training of trainers at ITAV, Fusagasugá (Source: FESOR Don Bosco Team).

Additionally, a laboratory was implemented for the measurement of fermentation parameters (nitrite, nitrate and ammonium) and other aspects that help to make operational decisions in a composting plant. This room is also used as the academic space where the theoretical concepts of the course are taught.



Figure 5.9. Learning environment II of the Integrated Management of Organic Waste and Composting course, and its use during the training of trainers at ITAV, Fusagasugá (Source: FESOR Don Bosco Team).

According to the nature of the educational institution (basic school education, labour or agricultural technician) and its infrastructure, each learning environment can be adapted to enable the replication of the

contents. Since they have an academic area, all theoretical contents can be transmitted there, increasing the potential for group work and the co-construction of knowledge.

Courses: Training of trainers and curriculum design

Conceptual, legislative and operational inputs for each course, structured and written by experts from Ecopartner (ISWM, WEEE and Organics and composting) and FiBL (Organics and composting), were delivered to teachers through the train-the-trainer method. For this, a one-week full time day was allocated in each case (figure 5.10).



Figure 5.10. Images of the train-the-trainer trainings with Ecopartner and FiBL experts: ISWM in April 2023, WEEE in April 2024, Organics and composting in October 2024 (Source: FESOR Don Bosco Team).

This activity, carried out in each learning environment, brought together both the teachers responsible for the pilot in the 3 main institutions and teachers from the schools involved to receive a post-Repic replication of the project. Student representatives and administrative staff also participated, as shown in the following graph:

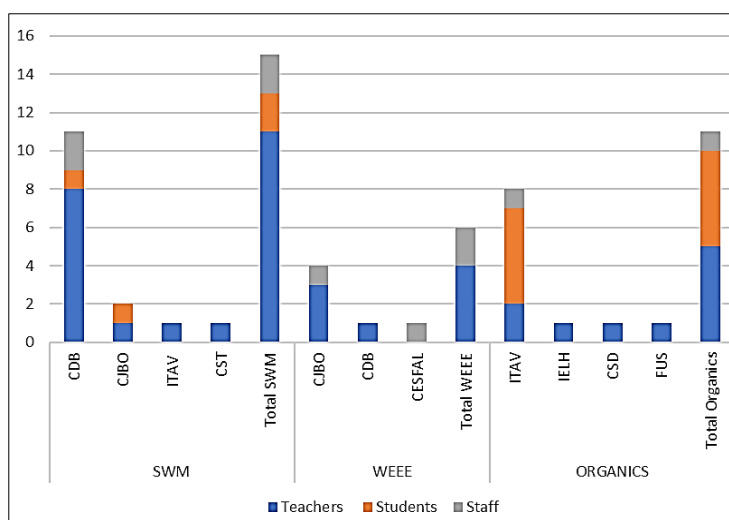


Figure 5.11. Number of teachers, students and administrative staff participating in the trainings of trainers of the 3 courses (Source: Ecopartner)

It is noteworthy that the teachers involved teach existing subjects close to FESOR's areas of knowledge, within the programs that each educational institution already offers in its portfolio.

With the conceptual inputs provided, the teachers developed the syllabus, didactic sequence and learning guides with which they replicated each course as a pilot with students from each institution.



Figure 5.12. Images of teachers' pilot replications with students in each institution: ISWM in the CBD, WEEE in the CJBO, and Organics (Source: FESOR Don Bosco Team).

Given the heterogeneous nature of the three pilot institutions, the replications with the students were developed under three different strategies and with students of different ages and profiles:

- The SWM course was replicated in CBD with students between the ages of 9 and 15, integrated as part of the academic activities in primary school subjects such as biology and chemistry, led by the high school chemistry teacher.
- The course on WEEE management was replicated at CJBO as a one-week in-depth workshop. It was aimed at students of technical work programs in Information Technology and Mechanics, aged between 14 and 18.
- The Organic Waste Management and Composting course was delivered as an in-depth activity for students aged between 10 and 14 years, in the framework of the 10th and 11th grade high school courses. This activity was led by a trained teacher from the agro-industrial training area.

This variety of institutions and target audiences demonstrates that the designed courses can be offered and adapted to different organizational contexts within the education sector, strengthening the knowledge, good practices and work skills (current or future) of different age groups, contributing to the life projects of different populations.

Empowerment and institutional capacity building

The participatory design of the courses and the involvement of Salesian institutions from the highest levels of management to the administrative, operational and teaching staff, resulted in an evident **empowerment** of FESOR Don Bosco as a relevant strategy to increase good practices in waste management. The process not only strengthened the **technical knowledge** of students but also complemented the capacities of teachers.

Thus, the project increased the **qualifications** of the Salesian institutions, including the strengthening of the inspectorial team in charge of the administration and coordination of all local activities, as well as those responsible for training and the organization's environmental management system. An example of this is the inclusion of regular characterization of institutional waste as a basis for the planning of sustainable waste management.

In the same vein, and to translate curricular content into institutional action, the Bogotá Inspectorate in 2024 carried out an **environmental campaign** focusing on the correct separation of waste and recycling called "Eco-Challenge". The guide for the campaign was a primer based on Learning Unit 1 of FESOR's SWM course (see Annex). Teams of students, administrators and teachers from 5 schools and the inspectorate itself collected and sold more than 4 tons of plastic, paper, cardboard and metals. The resources obtained were used for the closing activity in which all the institutions met to share their experiences, a space for institutional and intersectoral strengthening in which the District Secretariat of the Environment, Bogotá's environmental authority, participated.



Figure 5.13. Images from the environmental education activity EcoChallenge 2024, as a partial replica of the ISWM course, Learning Unit 1 (Source: Salesian Inspectorate Bogotá, Colombia; Spanish).

The pilot institutions have developed strategies to increase good waste management practices among students and their environments. In addition to environmental campaigns, for example, the CJBO designed an Integrated Institutional Waste Management Plan that complements the School Environmental Programme (PRAE, by its acronym in Spanish) that all schools in the country have by law.

4.3. Multiplication / Replication Preparation

As described above, during the implementation of the project (2022-2025) the contents of the courses were replicated in two ways: Firstly, in a pilot replication of the complete course (40 hours each), or secondly in a partial replication of one of its learning units in the form of an environmental education campaign or activity to strengthen good practices. In both cases the learning environments have been used as knowledge enhancers through learning by doing. These two forms of replication will continue to be implemented in new institutions, as part of the environmental actions of the Salesian Province in Colombia, and are potentially extendable to the institutions of the Medellín Province, thus expanding the territorial coverage within Colombia.

At the **international level**, as part of FESOR Don Bosco, Skat Foundation facilitated during 2023 the application of the RADAR tool for the self-assessment of networks, and the planning of the strengthening of the networks of Vocational Training Centres in Colombia and Latin America and the Caribbean. To show the potential for multiplication of the training strategies designed, Figure 5.14 shows the countries that are part of the PTC Network America.



Figure 5.14. Nodes of the Salesian Network CFP America (Source: Salesian Inspectorate of Bogotá; Spanish)

Environmental management and the sustainable management of solid waste from campuses and administrative offices were proposed as a theme for the meetings. To implement and analyse the self-assessment of the network that each participating node carried out, different meetings were held, all within the framework of the FESOR project, with the representation of 20 different countries, as shown in the following figure:

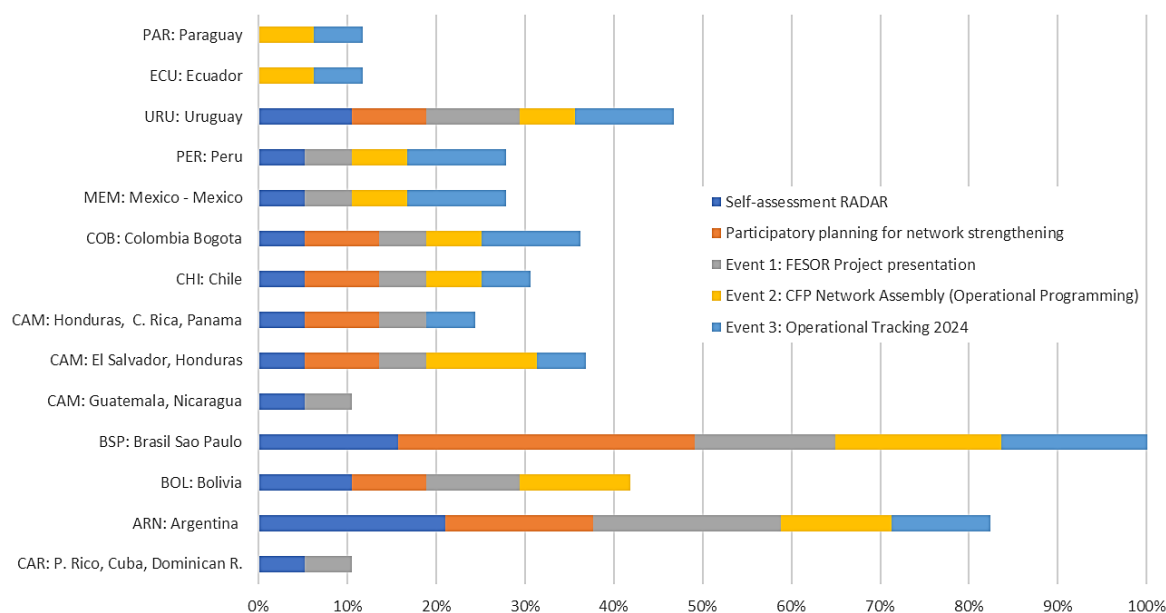


Figure 5.15. Participation of the CFP America Network nodes in the process of strengthening the Salesian network (Source: Ecopartner).

The dissemination of the project through these networks of Vocational Training Centres in Colombia and Latin America and the Caribbean has generated requests for replication of the contents in educational institutions in countries such as Brazil, Uruguay and Paraguay.

Job Opportunities for Young People: Cooperation and Partnerships

In the case of the WEEE management course, which is the one that has the highest potential of job opportunities in the short term, given the development that recent legislation is pushing for the implementation of the Extended Producer Responsibility systems in Colombia. A relevant success factor in this topic is that the existing take-back and recycling system and its underlying legislation in Colombia are the result of the Swiss Colombian Cooperation financed by SECO through the Sustainable Recycling Industries project (2014 - 2025), and in which some of the experts of Switzerland and Colombia were involved in the design and implementation of this FESOR course². For this reason, Ecopartner has facilitated the contact of different WEEE management companies and post-consumer programs in the country, who have openly expressed their interest in continuing to support the process with continuous strengthening of knowledge of the teachers involved, with technical visits and spaces for practice for the students trained, among other aspects of cooperation.

As a result of the FESOR project a cooperation agreement was signed between the Inspectorate of Bogotá and Lito SAS, the largest WEEE recycling company in the country, which was involved in the training of trainers of FESOR developed in April 2024 together with the Swiss and Colombian experts.

² Here is the information from SRI Colombia: <https://www.sustainable-recycling.org/programme-results/colombia/>. In addition to support in the development of extended producer responsibility (in Colombia, post-consumer programs) and recycling systems, Ecopartner's group of experts advised through the SRI program on the development of the standards and legislation, including the national WEEE management policy in Colombia published in 2017, whose methodological process is described in this document.: https://www.sustainable-recycling.org/wp-content/uploads/2025/03/2017_Practical-Guide-Systemic-Design-WEEE-Management-Policies-Developing-Countries_Mendez.pdf

In addition, the executive directors of the post-consumer programmes *EcoCómputo* (ICT devices), *Pilas con el Ambiente* (batteries) and *Red Verde* (household appliances), as well as the managers of the recycling companies OCADE, PCScheck and Lito SAS, participated in the closing ceremony of the project on May 29, 2025. This enabled the creation of further agreements to support both the training processes from FESOR Don Bosco, as well as the actual management of WEEE in educational institutions.



Figure 5.16. Images of the protocol closure of the FESOR project in the WEEE learning environment of the CJBO.

With the recent development of the solid waste related legislation and the systems for municipal waste and organic waste management in Colombia and the region, these sectors also offer significant potential for partnerships and labour inclusion. From 2020 onwards, all Colombian cities and municipalities are obliged to implement source separation and treatment strategies such as composting, as well as to continue to increase recycling, which requires selective collection of materials, a topic taught in the ISWM course.

4.4. Impact / Sustainability

The project's impacts since its conception in 2021 to 2022 included indicators that allowed monitoring the results related to the specific objectives, as follows:

Specific objective	Projected impact	Planned indicators
Strengthening institutional and training strategies related to increasing the sustainability of waste management as part of caring for the Common Home as part of Salesian values and principles.	<u>Impact 1:</u> Through the design and pilot implementation of courses on waste management, organic waste and WEEE, environmental education activities in institutions are strengthened.	<u>1.1.1</u> Achievement of the ESAP objectives related to solid waste management in each institution. <u>1.1.2.</u> Physical learning environments adapted in each institution, according to the pilot courses developed in each institution.
Strengthening of environmental responsibility skills and labour competences related to waste management in students and teachers.	<u>Impact 2:</u> The improvement of beneficiaries' environmental competences through practical training processes contributes positively to their environmental awareness and behaviour, as well as to their opportunities in the labour market.	<u>1.2.1</u> At least 6 educators and 60 students trained in the pilot project on waste management, organic waste and WEEE. <u>1.2.2</u> Educators and students are able to improve the ecological conditions of the context in which they operate. <u>1.2.3</u> Educators and students acquired specific knowledge on environmental care.
Strengthening of the Salesian network	<u>Impact 3:</u> The Salesian network is strengthened by the replication of the components of FE-SOR Don Bosco and by the analysis of the network as such.	<u>1.3.1</u> A database is set up to record the results of the training courses. <u>1.3.2</u> Material on training methods is developed and distributed to other institutions.

Table 5.1. Impacts and indicators included in the FESOR Don Bosco proposal (2022)

The results are described below, categorized into three groups: the strengthening of integrated solid waste management at institutional level, the training of teachers and administrative staff, and support for the formulation of the plan to strengthen Salesian networks:

Strengthening in institutional SWM (I.1.1, I.2.1, I.2.2, I.2.3).

In all the institutions involved, the institutional implementation of the new colour code for the correct separation of solid waste (resolution 2184 of 2019 of the Ministry of Environment and Sustainable Development) was strengthened, and in the technical and operational conditions of the collection points in each institution (GTC 24, Icontec³).

From the experience with the SWM FESOR Don Bosco course, the Inspectorate and its educational institutions adopted the practice of annual characterization of institutional solid waste, which is the basis for the definition of actions and monitoring of impacts achieved through related administrative activities, environmental education strategies, and partnerships. Additionally, regular activities of separation, collection and sale of recyclable materials (PET, glass, cardboard, office paper, among others) were adopted as a self-sustainable strategy for environmental education programs and operation of green points and collection centres. Separation generally involves students' families, broadening the impact achieved.

In addition to the environmental campaigns implemented in more than 6 educational institutions from the SWM course, the CJBO designed an Integrated Institutional Waste Management Plan that complements the PRAE that all schools in the country have by law, including strategies that increase good practices in waste management in students and their environments.

Finally, the institutions have learning environments adapted to the different topics addressed by the project (see figures 5.6 to 5.9): SWM in the CBD, CJBO and ITAV; WEEE in the CJBO and partially in the CBD. In the case of the course on organic management and composting, the project implemented the fertilization parameters laboratory at the ITAV and contributed to the strengthening of composting and vermiculture systems both at the ITAV in Fusagasugá (FESOR pilot) and at the two institutions that joined the curriculum design: La Holanda in Granada, Meta, and the Salesian University Foundation in Bogota.

Training of schoolteachers and administrative staff of the Inspectorate (I.1.2, I.2.1, I.2.2, I.2.3).

In addition to the results of the training of trainers and pilot replications with students, other indicators and impacts of the project are shown below.

<p>18 teachers (curriculum design)</p>	<p>During the participatory curriculum design, teachers were able to deepen the basic concepts through the training of trainers and the incorporation of the conceptual inputs provided by Ecopartner and FiBL into the learning guides and pedagogical tools subsequently used in the replication with students. A total of 18 teachers participated in this process, as follows: i) SWM course, 7 teachers (4 from CDB, 1 from ITAV, 1 from CJBO, 1 from CST); ii) GRAEE course, 5 teachers (3 from CJBO, 1 from CDB, 1 from CESFAL); iii) organic management and composting course, 6 teachers (3 from ITAV, 1 from IELH, 1 from CSD, 1 from FUS).</p>
<p>1.158 students 20 teachers (complete pilot replication)</p>	<p>Once the curriculum design was developed, replications were carried out with students and teachers from each institution according to their capacities and focus, as follows: i) SWM, 710 participating students and 9 teachers; ii) Organics and WEEE courses, 216 students and 6 teachers; iii) Organics and composting, 232 students and 5 teachers; iv) Organics and composting, 710 students and 9 teachers; v) Organics and WEEE courses, 216 students and 6 teachers; vi) Organics and composting, 232 students and 5 teachers.</p>

³ ICONTEC is the standardization body in Colombia.

<p>3.500 students 110 teachers 70 administrative staff (partial replication)</p>	<p>Learning unit 1 of the SWM and Organics courses was partially replicated by different educational institutions in the form of an environmental education campaign to increase the implementation of good practices of separation at source and recycling of materials. These campaigns included the collection and sale of the different materials and indirectly involved the students' families.</p>
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Table 5.2. People who strengthened their technical skills and good practices

Accompaniment in the formulation of the plan to strengthen the Salesian networks CFP America and CFP Colombia (I.3.1, I.3.2).

As described in section 5.3, the FESOR project was disseminated in 5 meetings that were part of the self-assessment process of the two networks, involving 20 countries in Central and South America. Additionally, based on the systematisation of the project, the Inspectorate will disseminate in the short term the methodology for evaluating and documenting the results that the subsequent complete and partial replications generate in the institutions of the different Latin American contexts.

5. Outlook / Further Actions

5.1. Multiplication / Replication

Multiplication in Colombia:

In the first instance, the five additional schools (in addition to the three that received the pilot: CDB, CJBO, ITAV)) involved in the participatory curriculum design, will initiate a process of replication of the courses: The Salesian University Foundation (FUS) in Bogota, the Agricultural Educational Institution La Holanda (IELH) in Granada, Department of Meta, and the Salesian Centre of Tunja (CST) and the Salesian Centre of Duitama (CSD), of the Department of Boyaca. They would receive support with the costs in terms of personnel financed from the Inspectorate of Bogotá and will have to include in their own budgets for 2026 the total or partial adaptation of the learning environments of the courses they plan to replicate. Upon completion of these replications in Colombia, more than 4000 students will have benefited.

The result of the pilot developed between 2022 and 2025 is a multi-product training strategy model that includes the 3 courses, the adaptation of their individual learning units to environmental education campaigns that enable a wider reach of the population that strengthens basic good practices (separation of waste at source and identification of recycling opportunities). Learning environments have also been generated for the different types of waste, which, in addition to their specific FESOR training purpose, could be used with different audiences as learning-by-doing spaces (Figure 6.1).

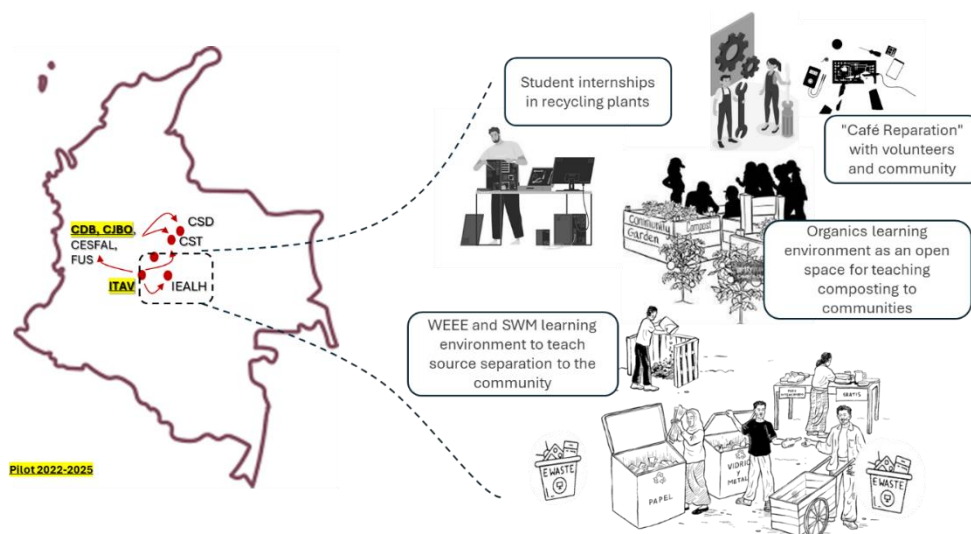


Figure 6.1. Uses of e-learning environments as learning-by-doing spaces with different target groups, additional to the courses designed and piloted with the project (2022-2025)

Scaling up products with a continuity project:

The potential for scaling up FESOR in Colombia has been identified, reconfiguring the courses designed, and adding two new modules that address relevant and urgent issues such as textiles and debris, designed with a methodology like that of the pilot, improved based on lessons learned. This process would seek to implement the courses and learning environments in the other institutions involved in the pilot, thus covering different departments of the country and heterogeneous educational purposes that broaden the potential for adaptation to different contexts.

With all this, this scaling-up seeks on the one hand, to achieve recognition of the Technical Work Program in Sustainable Waste Management by the Colombian Ministry of National Education, so that it can be widely offered within the Salesian educational portfolio in the country. This recognition can be sought under two scenarios: setting up a new program dedicated solely to the sustainable management of the waste addressed and proposed; or incorporating the modules already designed into existing programs to increase their chances of achieving quality certification.

On the other hand, a replication of the multi-product strategy in two Latin American countries is envisaged, which increases the impact on young people and the Latin American waste sector. This second phase would consolidate the model and, through the network of Salesian institutions in LAC and other continents, facilitate its replication in the global south. During the activities with the CFP America network, representatives from several countries, particularly from Uruguay, Paraguay and Brazil, have expressed interest in replicating the model. The Jugendhilfe Weltweit Don Bosco and the Salesian Province of Bogotá, with the support of Ecopartner, will carry out a relevance study that will make it possible to identify the country or countries in which a successful pilot replication of FESOR is most likely in the short to medium term. Subsequently, the Salesian organizations will look for donors to replicate the concept in more countries in the region, and even in countries on other continents such as Ghana and Nepal.

5.2. Impact / Sustainability during the multiplication phase

The Salesian educational institutions of Don Bosco differ from others in that their operating costs are not financed by the tuition fees of their students, as they are very poor. Therefore, international donors are relevant and other strategies that help to raise resources are fundamental to achieving the implementation of projects that strengthen both their programs and infrastructure, such as FESOR Don Bosco.

Through the support of personnel costs related to the adaptation of content and learning guides, the Bogotá Inspectorate will promote the replication of the training and environmental education strategies in the 5 additional institutions that were involved in the participatory curriculum designs. In this sense, given the low costs required, the most evident potential is for the SWM course which is introductory to the other courses. This is feasible since the campus itself can become a learning environment, by implementing in its regular management bins to separate waste based on the colour code of the context; they will also regularly weigh and characterize the waste generated, which can be linked to the course design.

Similarly, replications of the organic waste management and composting course in agro-industrial institutions similar to ITA-Valsalice (FESOR Don Bosco pilot) would only require strengthening the learning environments that almost all of them have as a space to practice composting. Given the possible difficulties in implementing the second environment due to its costs, the fermentation parameters laboratory, the Inspectorate and JuWe would support the formulation of projects and financial management.

In the case of the WEEE management course, the full implementation of the course and its learning environment may require the procurement of significant resources. However, as described in section 5.3 of this report, thanks to agreements with WEEE companies in the country contacted through Ecopartner, there is a high potential for continuous strengthening of teachers' knowledge of both the pilot at the CJBO and the partial replications of the course at the CBD, as well as technical visits and complementary practice spaces for the trained students. All of this will result in the sustainability of the training strategy over time.

Finally, thanks to the strategies promoted at the level of campus administration and the inspectorate itself, the Salesian institutions of Don Bosco will be able to reduce their carbon footprint in terms of solid waste management. This will be mainly due to the reduction in the amount of waste sent to landfills thanks to the reduction in the generation and use of materials in the organization and in the homes of the students' families.

6. Lessons learned / Conclusions

6.1. Lessons learned regarding project planning:

Human resources required: The development of the project depends to a large extent on human resources, such as the rectors, coordinators and teachers of the institutions involved in the project, as well as the coordinators and specialists who guide the work for the creation of the training and didactic material, so it is essential to guarantee that they can develop the project activities without interrupting the natural activities they carry out according to their work contract. This can be done by thinking of another type of employment contract and/or financial recognition for additional work they must do outside of work to meet the requirements of the project.

Definition of staff time: For the definition of the project execution times, the local context and the educational and/or academic realities of the institutions involved in the project must be considered, as each reality is different and not all of them can be considered to work in the same way, especially when implementing the training material.

Project budget: A good budget projection should be made, especially concerning learning environments and printed training materials, to avoid additional expenses during the project implementation. In the case of FESOR, the WEEE learning environment, which aims to simulate a manual disassembly plant, turned out to be more expensive than planned, which demanded the reorganization of some items of the initial budget.

6.2. Lessons learned from the implementation of the project:

Interdisciplinarity and technical expertise: For the development of the project and the results achieved, it was essential to involve experts not only with technical experience, but also with significant knowledge of the legislation and regulations of the solid waste sector in Colombia and worldwide, as well as the level of development of integrated management systems in the Colombian context. Likewise, it was essential that the teachers from the Salesian institutions involved also had knowledge related to the following aspects.

Teaching experience of the technical experts: Having technical experts who also have experience in academia allowed the structure of the conceptual and practical content provided as input for the curriculum design to correspond to the pedagogical logic of the educational institutions. Thus, 90 to 100% of the contents provided through the training of trainers and complementary strategies were used by the teachers and transmitted to the students in the pilot replications.

Heterogeneity of educational institutions: Having institutional variety in terms of both focus and target audience facilitated the generation of a model adaptable to different contexts and needs. Technical institutions focused on offering service learning such as automotive mechanics, electricity or IT, facilitate the implementation of the integrated WEEE management course, as was the case of the CJBO; while agricultural-technical institutes such as the ITAV facilitate the development of the course on organic management and composting.

Training of trainers: As a participatory curriculum design methodology, training by international experts was used for the trainers in the schools, who in turn already had basic knowledge of the area of application. However, although in the intensive one-week training all topics were covered, it became evident in the subsequent processes that reinforcements were needed in some areas.

A holistic and introductory course: The Integrated Solid Waste Management (ISWM) course not only offers a systemic look at the legislative-normative and technical frameworks of ISWM in cities and municipalities, but also offers the possibility to turn its learning units into environmental education activities offered to a wider general public, increasing the number of people with a reinforcement of basic good practices such as correct separation at source and sorting of different types of materials.

Participatory curriculum design: Participatory curriculum design seeks to increase the empowerment of the teachers and administrative staff involved. However, it may require more effort in terms of time and human resources, which challenges the project leadership team to have multiple strategies, tools and methodologies to provide flexibility to the design process and thus to achieve the expected results.

Knowledge management and personnel changes: It is necessary to define strategies to guarantee the continuity of the people who conduct key tasks in the project, mainly the teachers who animate the training and develop the curricula. To provide continuity of the fundamental knowledge of the courses even though the trained staff leave the institution multiple strategies are needed. In this sense, during the development of FESOR Don Bosco, content documents, self-contained digital and pedagogical tools were created, teachers from institutions other than the pilot organizations engaged in curriculum design, and reinforcement was provided to new teachers when changes occurred.

6.3. Conclusions:

- The project turned out to be a challenging and ambitious undertaking that requires a great deal of work for its development; however, it is a project that can have an impact in different aspects (formative, social, institutional and charismatic), making it a project worth working on and continuing to work on.
- The project must be implemented in a clearly articulated, properly communicated, and successfully implemented and effective way, as it depends on many internal and external factors for its development.
- The FESOR project has allowed the Salesian Society to identify new training opportunities for young people that can bring innovation to the curricula and contribute concretely to changing practices and habits in waste management, in favour of environmental care.

6.4. Recommendations for similar projects:

- **Existence of legislation and waste management systems in the context:** On the one hand, the FESOR Don Bosco concept seeks to strengthen good practices in solid waste management of students, teachers and administrative staff of educational institutions. On the other hand, it promotes the creation of alliances with the waste recovery and treatment sector in the context of the institution, increasing the opportunities of labour inclusion for young people. For all this, it is important to know the state of progress of the regulatory and legislative framework of the solid waste sector, as well as the existence and maturity of the collection, transport and treatment systems of the different materials in the cities and municipalities where the model will be implemented.
- **Sectoral standards of labour competences (NSCL):** To increase labour inclusion at the technical level, it is important to verify the existence of NSCL and to include their guidelines in the structure and content of the courses.
- **Curriculum design processes and recognition or accreditation processes by the national educational authority:** The FESOR Don Bosco curriculum design and implementation team required the formation of an interdisciplinary team that addressed the technical aspects of the waste sector and the circular economy, and that managed the guidelines and requirements of a curriculum design at the institutional level. To achieve program recognition or quality certification, it is necessary to be aware of the requirements of the national educational authorities.

7. Annexes

- 2024. Booklet “Conociendo mis residuos” (Spanish). Excerpt from the GIRS course used as material for an environmental education campaign in educational institutions. PDF
- 2024: Replica press release FESOR Don Bosco WEEE Management course (Spanish): <https://salesianosbogota.org/cierre-de-la-implementacion-del-material-formativo-del-proyecto-fesor-don-bosco/#-carousel-builder-933-6265-8>
- 2024: Social media post “The objectives of FESOR Don Bosco” (Spanish): <https://www.facebook.com/CentroJuanBoscoObrero/videos/proyecto-de-formaci%C3%B3n-en-ecolog%C3%ADa-integral-fe-sor-junto-a-salesianos-bogota-y-en/832797332070313/>
- 2025: Protocolar closing session press release (Spanish): <https://salesianosbogota.org/cierre-del-proyecto-fesor-don-bosco-jovenes-formados-para-cuidar-el-planeta/#-carousel-builder-933-6265-8>