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Building Partnerships for a ENVIRONMENTAL PROTECTION made in Germany Sustainable Infrastructure

Extended Producer Responsibility Scheme for Packaging Waste in Egypt

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

جمهورية مصر العربية - وزارة البيئة
Arab Republic of Egypt-Ministry of Environment

NSWMP
National Solid Waste Management Programme
البرنامج الوطني لإدارة المخلفات الصلبة

WMRA
Waste Management Regulatory Authority

Disclaimer

The mission covered by this report took place during the Covid-19 pandemic. For this reason, most of the trips and face to face engagements initially considered, were not taken place. However, exchanges with various stakeholders could take place over digital means of communication, allowing for contributions to be gathered. Any statement or opinion expressed in the present document has not received any feedback from the relevant stakeholders. The report in its current state cannot be construed as representing a final assessment or recommendation for the establishment of an Extended Producer Responsibility (EPR) system in Egypt but as a basis for discussion and feedback gathering.

Preface

The German Federal Ministry for the Environment, Nature and Nuclear Safety (BMU) has commissioned the German agency for international cooperation Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH to implement the global project "Support of the Export Initiative for Green Technologies".

It is part of the larger BMU "Export Initiative for Green Technologies", launched in 2016, to export know-how available in Germany and support sustainable development worldwide. Partner countries are Egypt, Jordan, India, Thailand, Malaysia, Indonesia and Ukraine. Furthermore, there are two global modules supporting the Global Solution Initiative and Industrial Water Treatment as well as a management unit in Germany.

Project measures focus on building up technical and institutional know-how as well as laying the groundwork for the introduction and use of environmental and climate protection technologies "Made in Germany".

The project contributes to the UN's sustainable development goals (SDGs) and focuses on knowledge transfer, pilot projects, sustainable business models, capacity building, environmental education and awareness raising.

The supported activities are embedded in the national strategies of the partner countries. They are implemented in cooperation with bilateral GIZ projects and contribute to solving key environmental problems, such as poor waste management, air and water pollution or supporting infrastructures for sustainable urban development.

In this context, the Ministry of Environment in Egypt with the support of the National Solid Waste Management Programme (NSWMP) and in cooperation with the Ministry of Industry and Trade, aims to develop an Extended Producer Responsibility (EPR) system for packaging waste that will increase the recycling rates and improve the cost recovery of its collection and transportation.

Egypt generates immense amounts of plastic packaging waste that reaches the oceans (marine litter) due to an inefficient collection system. Especially in the tourism sector, inadequate disposal of waste material influences the visitors' experience, negatively effects tourist attractions, and harms the oceans' biodiversity. As one of the fastest growing sectors in Egypt, the tourism sector poses a great opportunity to implement Egypt's first EPR system for packaging waste.

The mission assigned to the contractor, Black Forest Solutions GmbH and Landbell AG, was to develop an EPR scheme for packaging waste in Egypt, following best practices of the European Union Member States and adapting these to the local conditions of Egypt. The aim of the assignment is to develop the institutional set up for an EPR scheme for packaging waste in Egypt under the draft waste framework law, with respect to the roles and responsibilities of both the public and private stakeholders, the required local infrastructure, and a roadmap of implementing the EPR scheme in a pilot area (a set touristic area along the Red Sea) and its expansion plan at national level.

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List of Abbreviation

CSR	Corporate Social Responsibility
ECO-FEI	Environmental Compliance Office and Sustainable Development
ENCPC	Egypt National Cleaner Production Center
EPR	Extended Producer Responsibility
EEAA	Ministry of Environment
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IDA	Industrial Development Authority
IPR	Individual Producer Responsibility
MoE	Ministry of Environment
MoT	Ministry of Technology
MTI	Ministry of Trade and Industry
NSWMP	National Solid Waste Management Programme
OECD	Organisation for Economic Co-operation and Development
PRO	Producer Responsibility Organisations
P&G	Procter & Gamble
WMRA	Waste Management Regulatory Authority

Stakeholders

Project Lead	Persons met
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	Sherien Ali, Advisor for Technical & Institutional Support
	Tarek Saleh, Advisor for Private Sector
	Amany Bahgat, Advisor for Marine Litter
Public Stakeholders	**Persons met**
Waste Management Regulatory Authority (WMRA)	Dr. Ahmed Farouk
	Dr. Khaled Shahin
	Adel Shafei Othman, Policy Adviser, Chemicals and Waste Policy
Egypt National Cleaner Production Center (ENCPC), Ministry of Trade and Industry	Maysara Fouad, Head of Resource Efficiency and Cleaner Production and Green Economy
	Mohamed Sabry, Director
Industrial Development Authority (IDA)	Mohamed Farouq, Amin
Ministry of Tourism and Antiquities	Nashwa Mohamed Talaat, Advisor
Producers	**Persons met**
Unilever	Mohamed Badreldin, Head of Government & External Relations
Nestlé	Nahla Kamal, Director of Corporate Affairs
L'Oréal	Nahla Mokthar
Coca Cola	Shereen Shaheen, Regional Government Affairs, Communications & Sustainability Director Egypt, Libya & Sudan
Procter & Gamble (P&G)	Younes Tamer
Juhayna Food Industries	Passant Fouad, Associate Director of External Communication

Producers	Persons met
PepsiCo	Kareem Abdel Monem, Public Policy and Government Affairs Manager
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	Mariam Ramzy, Global Procurement Director
	Samir Kumer, Global EPR Programs Manager
Recyclers	**Persons met**
BariQ	Usama Zaki, CEO
	Ahmed Nabil Elmizayen, Commercial Manager
Greenminds	Mohamed Abou Sekkina, Commercial Director
	Samah Fawzy Awad, Food Recycling Project Manager
Trade Associations	**Persons met**
ECO-FEI	Ahmed Kamal Abdel Moneim, Executive Director
	Adel Mohamed Taha, Sustainable Development Expert
	Farah Rehan, Communication Specialist
Egyptian Hotel Association	Imad Hassan, Advisor
Projects and Initiatives	**Persons met**
ECO-Dahab	Nadeen Abdelwahab, Founder
Plastic Bank	Amr El Kady, Country Manager
Electronic waste project	Tarek El-Araby, Project Manager
	Hodra Shakra, Technical Officer

1. Executive summary

GIZ organized a stakeholder consultation round with a view to gather information, positions and support of the project of implementing an EPR solution for packaging waste in Egypt, consisting in developing the institutional set-up and in a defining a roadmap for a pilot in touristic area and how to expand it a national level.

The consultation round took place from March 8 to March 12, 2020 and involved public and private stakeholders.

Within the framework of the report on the implementation of an EPR system in Egypt, a first analysis and assessment of the initial situation in Egypt was conducted. For a holistic overview, in the first part of the report, a general introductory explanation of EPR was given and the different types of EPR systems were outlined. Various instruments and measures necessary for a successful implementation of the EPR system were presented in a number of recommendations.

In a second part, the focus of the report was placed on the target country Egypt, with an insight in the current status of the legal framework for the implementation of EPR, as well as a proposition of a roadmap for the legislative drafting process. The different stakeholders involved in the EPR system in Egypt were introduced and a suggestion for the distribution of roles and responsibilities was presented in descriptive diagrams.

In the third part, a possible location for the pilot case has been identified. A decision was made between sites in the Red Sea Governorate and sites in South Sinai Governorate. For this purpose, a detailed analysis of the two governorates was carried out. The tourist locations were evaluated for the number of Green Star Hotels, Egypt's Green Certification Program in support of Sustainable Tourism, as well as for the quantities of waste generated and the waste compositions. In addition, the waste collection and treatment infrastructure was investigated to assess the location with the most suitable prerequisites for the pilot case. It is recommended to conduct the pilot case in Red Sea Governorate, because the conditions are favourable: There is a relatively high number of Green Star hotels and the city of Hurghada has a close proximity to the waste sorting facility.

To ensure successful implementation, the last part of the report presents practices from Germany and Chile for the realisation of EPR systems.

This consultation led to the following findings:

- There is a strong interest for EPR, from WMRA who expressed high and diverse expectations;
- Previous engagements in EPR, dating back to 2014, did not lead to practical steps so far;
- There is a need of political alignment between Ministry of Environment (MoE) and Ministry of Trade and Industry (MTI) on objectives which need to be resolved to provide a stable platform for EPR;
- Regulations have to be complemented, clarified and aligned to promote a practical and effective enforcement of EPR;
- There is a lack of readily available data regarding waste generation and collection;
- Overall knowledge on EPR principles and mechanisms needs to be reinforced at all levels;
- There is a clear demand from the Private Sector for a producer driven EPR solution;
- Informal sector engagement is a key success factor and incentives will have to be developed;

- Pre-existing voluntary initiatives from Private Sector should be included in the EPR framework as they can facilitate lifting the EPR initiative off the ground;
- Beyond packaging there is a demand for EPR for other waste categories such as e-waste and hazardous dispersed waste (paint, chemical etc.);
- There is an opportunity for a privately held, producer-funded, operational take-back Producer Responsibility Organisation (PRO) model to develop packaging waste collection in Egypt with a gradual deployment from an initial pilot to a nation-wide operation.

Further stakeholders' consultations via remote tools led to the following conclusions:

- Important first step towards EPR is the conduction of a pilot. This pilot should cover key packaging waste streams such as plastics, multilayer packaging, paper and cardboard, metal and glass, in order to acquire useful data in the perspective of a national deployment;
- Preferred location is the city of Hurghada as it boasts both a number of Green Star hotels and an operational recycling facility;
- There is a need of a specific EPR regulatory framework which should implement the concepts such as EPR, registry and PRO, set objectives and targets, clarify roles and responsibilities and provide a basis for informal sector integration and industrial investment

2. Introduction

2.1 The Extended Producer Responsibility Scheme

As defined by Organisation for Economic Co-operation and Development (OECD) [1], an EPR scheme is an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle.

An EPR policy is characterized by:

- The shifting of responsibility (physically and/or economically; fully or partially) upstream toward the producer and away from municipalities;
- The provision of incentives to producers to take into account environmental considerations when designing their products.

EPR was first conceptualized and coined in 1990 by Prof. Thomas Lindhqvist of the Lund University in Sweden. He described EPR as ***"making the manufacturer of the product responsible for the entire life-cycle of the product and especially for the take-back, recycling and final disposal".***

The first practical implementation of the concept took place in Germany by former environment minister Prof. Töpfer, at a time when Germany was facing increasing packaging volumes while at the same time landfill capacities were limited. Increasing costs led to increasing waste collection charges for citizens. EPR was retained as solution for the problem, with 3 goals:

- **REDUCE**: Change the game towards less packaging and hence less packaging waste;
- **RECYCLING**: What can't be avoided shall be recycled (first: material: second: energy recovery);
- **EFFICIENCY**: Packaging waste treatment shall be consumer friendly (collection and cost).

Through the German Packaging Ordinance of 1991, producers were brought to:

- **Finance** collection and treatment of waste packaging.
- Engage in a **better packaging design** for:
    - **Use of less packaging material;**
    - **Use of recyclable materials.**

Since this initial experience, in nearly 30 years of existence, EPR principle has led to the establishment of hundreds of EPR systems covering products such as:

- Packaging;
- Electrical and Electronic Appliances;

[1] https://www.oecd.org/env/tools-evaluation/extendedproducerresponsibility.htm

- Batteries;
- Printed paper;
- Tires;
- Vehicles;
- Oils;
- Textile;
- Hazardous Dispersed Waste;
- Sharps;
- Agricultural products.

From an initial mostly European centre of gravity, EPR developed globally and such systems now exist on all continents, to a variable extent.

2.2 EPR for packaging waste in Egypt

The concept note of the project sets the objective of the establishment of an EPR system for packaging waste.

In order to narrow the focus, a specific area within the tourism sector along the Red Sea is envisaged as a pilot location for a potential implementation of an EPR system for packaging waste. However, the actual location of the pilot has to be confirmed after review of relevance and convenience criteria.

An established EPR system for packaging waste in touristic areas would contribute to the plastic recycling value chain by:

- Channelling packaging waste into a separate waste stream allowing for sorting and recovery;
- Allowing for an access to recyclable and then recycled material replacing virgin materials for the production of certain packaging;
- Reducing uncontrolled waste treatment such as dumping and littering and therefore also reducing the pollution of tourist areas with packaging waste;
- Contributing to Egypt's planned circular economy.

3. Extended Producer Responsibility

3.1 EPR vs. CSR

EPR has demonstrated, provided minimum conditions for success have been met, as described further down in this report, its ability to divert waste from landfill, increase recycling rates and transfer costs from municipalities to producers. There is less evidence of its contribution to effectively incentivise Design for Environment, as other incentives may influence producers in parallel to embark into it, such as cost of raw materials for instance.

EPR should not be confused with Corporate Social Responsibility (CSR). Whereas EPR is product-centric, CSR is company-centric.

In other terms, CSR focuses on various societal goals that a company wants to achieve. It is also usually an entirely voluntary endeavour, left at the initiative of each company, though society and peer pressure can influence a company into adopting CSR initiatives.

EPR on the other hand focuses on the post-consumer stage of the product life cycle. It certainly also addresses product design, but with recyclability and circularity in mind. Though EPR can be implemented on a voluntary basis, it tends to be enforced in most cases under mandatory regulations.

So EPR affects a company in its producer (of a product) capacity.

Moreover, EPR can and actually should be one element of an overall CSR policy of a company. It can be monitored that global companies consider take-back and recycling of the goods they placed onto the market in their CSR policies as a result of globally growing EPR type regulations. However, for the successful local implementation they need a stable and suitable framework such as national EPR type policies defining roles and responsibilities among other aspects.

3.2 Notion of producer in EPR

It is worth mentioning that under EPR, the notion of a producer cannot be restricted to the manufacturer of the product. In an EPR system, the company usually considered to be the producer of a product is the company introducing said product first on the territory targeted by the regulations.

For instance, it can be:

- The manufacturer if the manufacturing is taking place in the territory;
- The importer if the manufacturing is taking place outside of the territory;
- The distant seller in case of online sales from outside the territory;
- The retailer if selling a 3rd party product under his own brand;
- The market-place over which a distant sale took place.

Beside EPR, complementary notions have been developed such as shared responsibility. For instance, in the e-waste area, Brazilian regulations see that overall responsibility is shared between producers and retailers.

In the particular case of packaging, regulations sometimes consider as obligated party, like in the UK:

- The raw material manufacturer, for instance a paper mill producing corrugated cardboard;
- The converter turning the material into a product, for instance a cardboard box;
- The packer (or filler) placing packaged products on the market, for instance a food manufacturer;
- The seller passing the product onto the end user, for instance a supermarket.

However, as such shared responsibilities add complexity to the system, most countries typically consider the party putting packed products for the first time onto the national market (often "the brand" facing the consumer) as the only obligated party being required to organize EPR for its products - expecting those parties have sufficient influence on their supply chain to impact the packaging design including the selection of used materials and indirectly sharing the cost upstream.

3.3 Types of EPR

EPR schemes may have different applications and enforcement, depending on the expected goals and local legislation. Some main examples of EPR schemes are:

- Take-back requirement:
  - Example: collect products/packaging after disuse and achieve x% collection rate (sales volumes @ different base year(s)) and/or x% recycling rate (could be material / product specific).
  - This is the mechanism most often equated with EPR. It gives an obligation to the producer to arrange for the collection (and treatment) of products when they reach post-consumer stage. This is a physical obligation, that can be delegated by producers to service providers, in particular to PRO.

- Economic instruments:
  - Deposit/refund

    Example: pay x EGP deposit when buying a bottle of soda and get the money back when the empty bottle is returned to the store.

    This is can only be applied for a limited number of products (since not implementable at kerbside) and is typically encountered in the packaging area, for glass and plastic beverage bottles and metal cans. The deposit system was initially designed for the reuse of the containers. However, deposit systems now also exist for single-use beverage bottles/cans and their recycling. They create an incentive to bring back the containers in a separate collection stream, ensuring a clean supply of material for recycling and avoiding littering.

  - Advance disposal fees

    Example: pay upfront (at purchasing time) the cost of future disposal of the product.

    This mechanism can be considered as a tool to ensure the provision of funds necessary

when the product effectively reaches its end of life. It is a way to mitigate the risk of an obligated producer going out of business and therefore not fulfilling its obligations. This is particularly relevant for products with a longer life span. However, it can also be an instrument to dissuade the use of certain products (e.g. plastic bags in a retail). This mechanism is arguably more enforceable than disposal fees for households (as they exist for e-waste handling in Japan for instance), who could prefer discarding the waste for free in unsuitable locations.

- Material taxes

  Example: pay a tax if a product only contains virgin materials.

  This mechanism is mainly to reduce the material use but could also be used to finance take-back and recycling if funds are allocated accordingly.

- Upstream combination tax/subsidy.

  Example: pay a tax for using virgin material and receive subsidy for using recycled material.

- Recycled content standards:
  - Example: impose a minimum % of recycled materials in the product.

The various mechanisms described above are not mutually exclusive and combinations are possible. For instance, the visible fee mentioned above for e-waste in some European countries applied on top of an essential take-back obligation.

Nowadays, EPR is most often implemented as a take-back obligation, as shown in Figure 1.

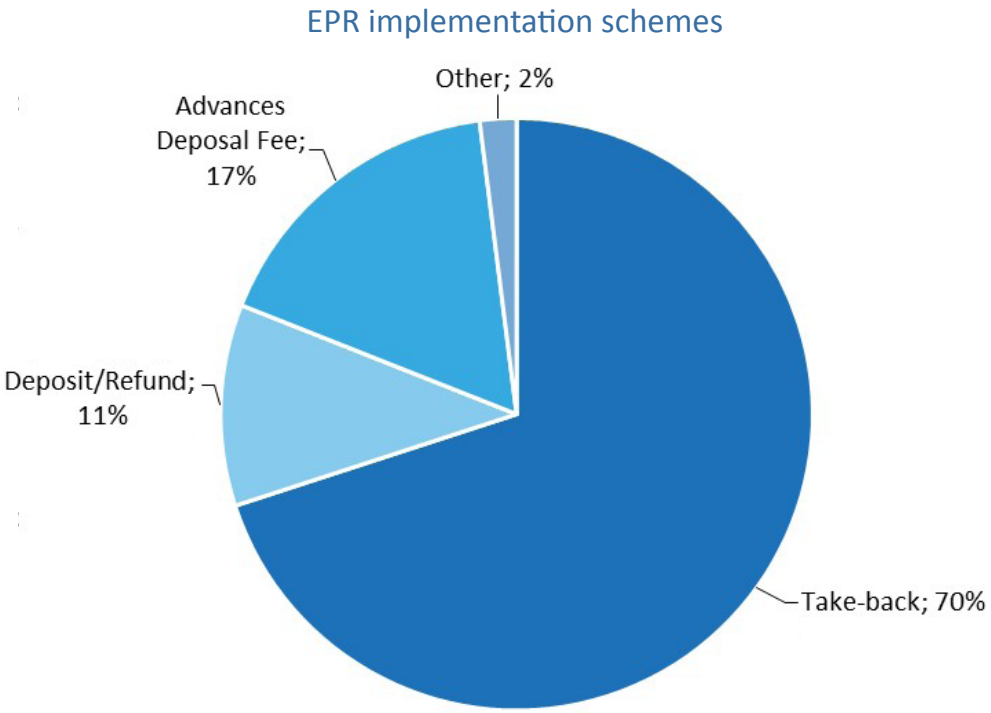

Figure 1: What we have learned about EPR in the past decade? – A survey of the recent EPR economic literature, Paris (Source: OECD, 2013)

The choice of instrument will depend on various factors, ranging from the key objective(s) of the EPR regulations to the parameter of the products and territory under the EPR-to be.

3.4 EPR objectives

The implementation of an EPR scheme can have multiple effects and there is a need to define clearly what are the objectives pursued with the EPR initiative. In Figure 2: Objectives of an EPR scheme (Source: Landbell, BFS, 2021), an overview of potential EPR objectives is displayed. It is possible that a combination of the following subjects will generate the overall EPR objective. The specific objectives selected will impact the design of the EPR scheme.

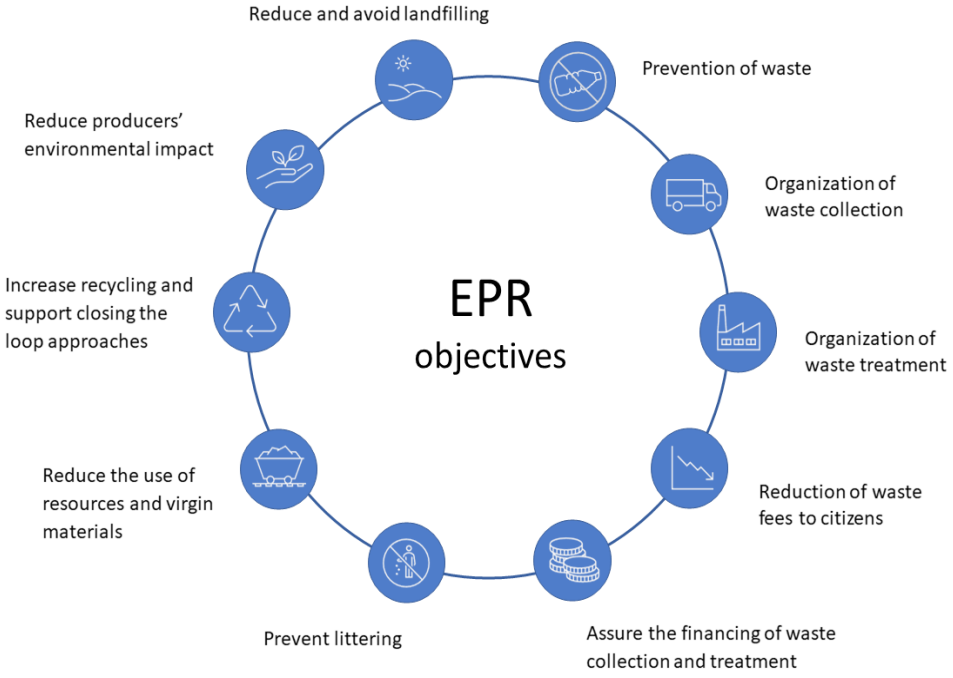

Figure 2: Objectives of an EPR scheme (Source: Landbell, BFS, 2021)

3.5 Parameters for EPR design

In order to design a practical and functional EPR system, the following dimensions have to be addressed and understood:

- The markets at play at product, waste stream and (recycled) raw material levels.
- The characteristics of the territory in terms of geography, demography, economics, infrastructure.
- The stakeholders involved, their expectations and potential roles and responsibilities.
- The targets to be achieved:
    - Are they quantifiable? are they realistic? are they ambitious?
    - What is the timeline for achievement?

- Are they indicative or mandatory?
- Are they collectively set or individually?

- The legal framework that is necessary to make the EPR objectives enforceable.
- The regime of incentives and penalties that will support enforcement.
- The licensing process for the PRO if any.

3.6 Producer Responsibility Organisation (PRO)

EPR obligation can sometimes be discharged individually by producers (Individual Producer Responsibility) but also collectively (Collective Producer Responsibility).

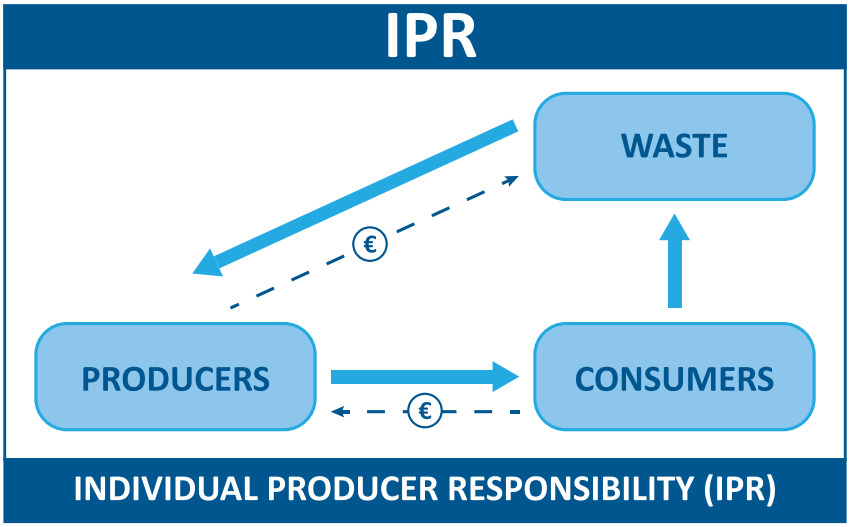

Figure 3: Individual Producer Responsibility (IPR) (Source: OECD Report on EPR, 2016)

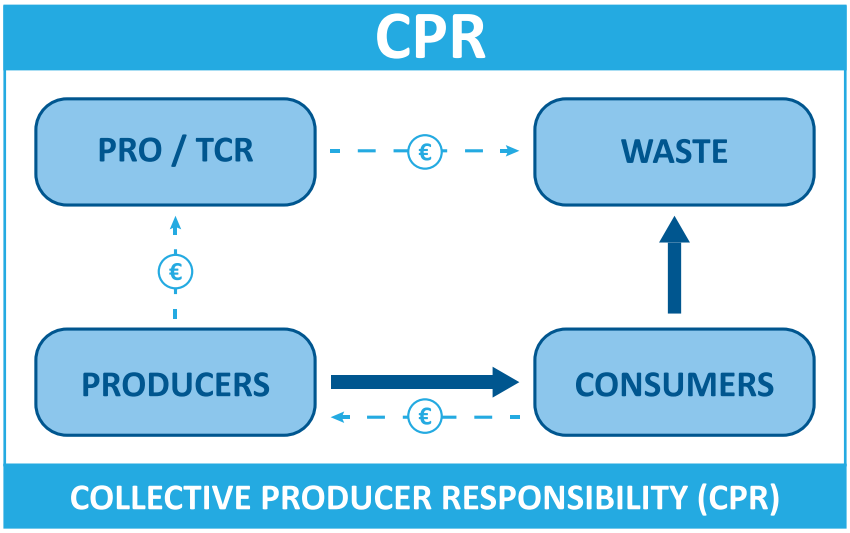

Figure 4: Collective Producer Responsibility (CPR) (Source: OECD Report on EPR, 2016)

Collective discharge is usually performed by a particular type of entity, the PRO. PROs are particularly relevant for dealing with take-back requirements, deposit/refund requirements and advance disposal fees.

A PRO is a legal person which organises the compliance of producers with EPR obligations and/or targets – operationally and financially. Generally, a collective PRO is funded by producers in proportion of their market share for the products or streams covered by the EPR regulations.

PRO often offer a more cost-efficient solution than individual EPR solutions on the basis of identical achievements, as it allows to share resources in particular in terms of infrastructure and fixed costs.

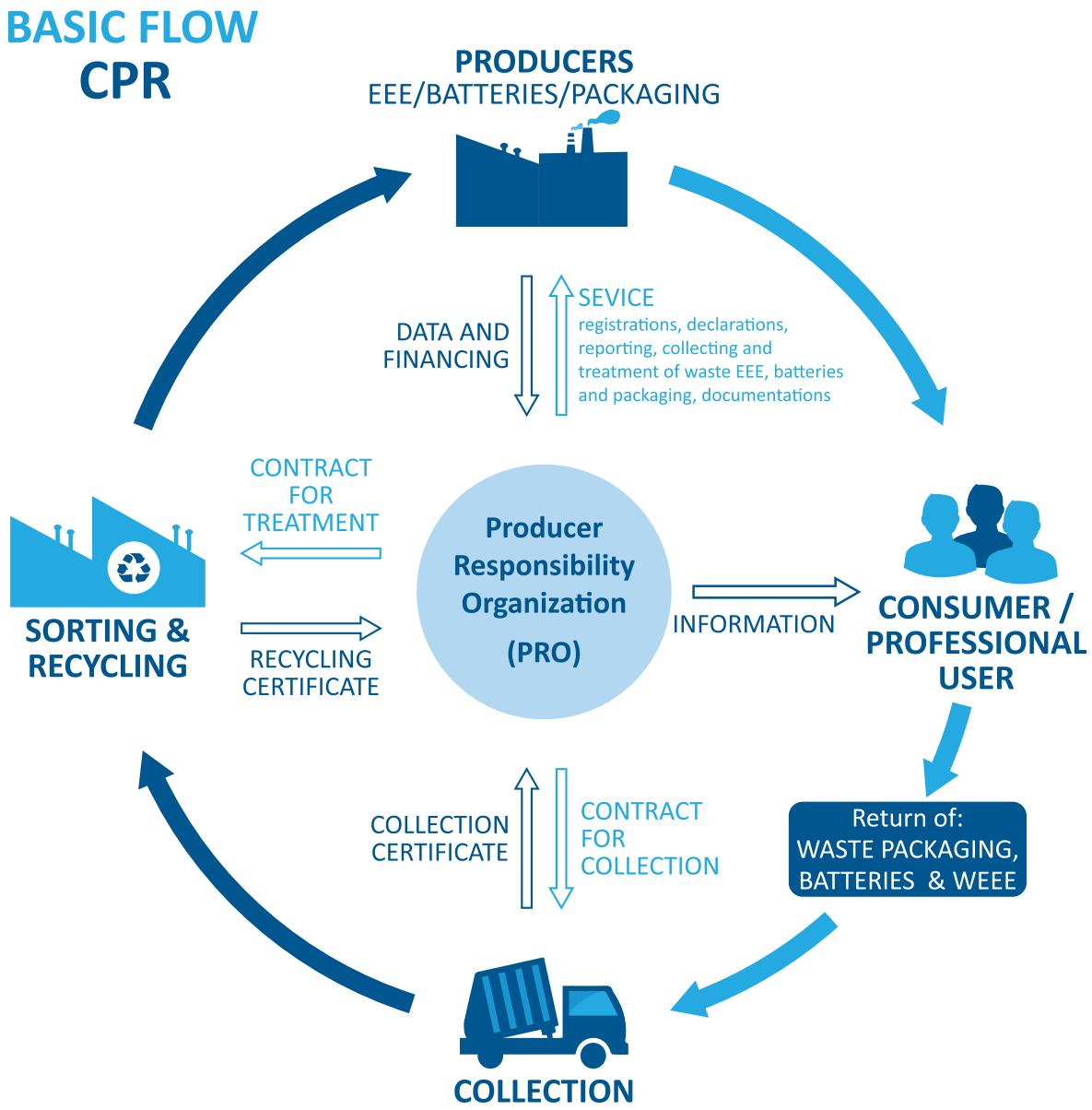

Figure 5: Basic Flow of CPR (Source: OECD, 2016)

Individual Producer Responsibility typically makes only sense, when the producer knows where its products are and when they are ready for return and the number of collection points is limited e.g. for B2B products. IPR is typically not a reasonable option for consumer packaging waste being a multi-brand and product mixed waste stream collected at countless locations across the country.

3.7 Parameters for PRO Design

In order to design an efficient and effective PRO framework, the following decisions have to be made:

Institutional set up in terms of legal entity, ownership, governance, tax regime…

Scope of work in terms of financing and management of operations, control of financial flows, awareness and education, monitoring of quantities placed on the market, producer obligation calculation, supply chain performance and compliance control…

Business model, for instance should the PRO focus on financing or running the operations, run a deposit system, a take back scheme…

3.8 General recommendations for successful EPR implementation

3.8.1 Set smart targets for recycling and for phasing out landfill

Clear, stretch,and reliable targets are essential to develop a more circular economy. All relevant actors need to know how to behave, e.g. how much waste to collect or to recycle within a given year and for a given waste stream. In order to be effective and to avoid stagnation, targets need to be smart: they need to be set in advance and adjusted over time based on both the progress made and the available technologies. In addition, they need to be clearly defined and the corresponding calculation methods need to be transparent and applicable. Only these clear provisions combined with a stable policy framework provide the necessary security for fostering huge investments in changing product design, adapting new recycling technologies, and pushing digitalization needed to achieve ambitious goals.

- Set targets that are clearly defined, stretch, but also achievable for both collection and recycling of waste, taking into account the specific challenges posed by each waste stream and local circumstances; avoid stagnation by regularly reviewing the targets according to the technical progress and the achievements made so far; define targets for all actors in the value chain, i.e., not only for recycling, reuse and collection, but also for quality of e.g., waste treatment.
- Define transparent, applicable and harmonized methods for the calculation of target achievements and implement them in parallel with setting the targets; calculation methods have significant impact on the ability of all actors to achieve targets.
- Define harmonized quality standards for secondary raw materials to foster the demand; align waste, products and chemicals legislation in order remove obstacles hindering the uptake of recycled materials.
- Stop subsidies for linear materials and processes hindering the implementation of circular solutions.
- Fully utilize design requirements such as harmonized criteria for EPR modulated fees, to promote recyclability and the use of recycled materials when technically feasible.
- Accelerate and enforce the ban on landfill of waste.
- Restrict the incineration of recyclable waste.

3.8.2 Strengthen EPR in a level playing field

The principle of EPR has proven over the years to be a very effective means to ensure proper collection and recycling of waste. Only EPR creates the necessary level-playing field among producers by making all of them responsible for managing the take-back and treatment of their end-of-life products and packaging. Thereby, all producers have an inherent economic incentive to increase recyclability and reusability. This instrument becomes even more effective when linking producers' financial contribution to the recyclability of their products and packaging, e.g. via modulated fees. The principle of EPR functions best within a competitive environment with multiple EPR schemes respecting minimum requirements and releasing positive market forces for implementing the most innovative solutions.

- Set clear and harmonized minimum requirements for EPR to create a true level playing field which promotes entrepreneurship and competition.
- Combat free riding on the EPR obligations by reducing the complexity of administrative requirements and allowing a straightforward implementation in particular for SME and importers.
- Harmonize all provisions with regard to product design, such as criteria for modulated fees, the use of markings, consumer information delivered with the product, or design requirements.
- Impose sufficiently high and enforceable financial incentives (e.g., through modulated fees) based on a fair methodology and accepted evidence documentation, in order to increase the recyclability and reusability of products and packaging.
- Promote cooperation in the field of research and development, awareness raising campaigns, clearing mechanisms or modulated fees.

3.8.3 Empower consumers

Consumers play an important role in the transition towards a circular economy. Their consumption behaviour has a huge impact on the amount of resources used. The way they dispose of their waste products and packaging heavily influences both quantity and quality of recycling. Consumers are able to actively contribute to the circular economy only if they are fully aware of their actions' consequences.

- Explain to consumers their power and how each individual can make a difference in the transition towards a circular economy, e.g., via children education and awareness raising campaigns.
- Provide transparent and verified information on the recyclability and reusability of products and packaging, in order to increase consumers' trust and allowing them to make informed consumption choices.
- Empower and educate consumers to correctly dispose of their waste products and packaging.

3.8.4 Harmonize rules

Rules that respect the principles of competition, open markets and a fair level-playing field is the foundation of this cost-effective implementation. In addition, such an environment fosters innovation and facilitates investments for improving product design and implementing better recycling technologies.

- Assure a stable policy framework to guarantee investment security.
- Reduce legal complexity and administrative burden through harmonization of rules and processes.
- Facilitate entrepreneurship and enable businesses to develop and implement innovative ideas.
- Remove monopolistic and protectionist structures as well as other legislative and non-legislative barriers for competition in the waste and resource markets.
- Promote the development of global waste and resource markets with internationally harmonized rules and processes in order to increase market efficiency and to better utilize economies of scale.

3.8.5 Ensure effective enforcement

No matter how ambitious legal provisions are: they are worthless if not followed correctly. Therefore, it is of utmost importance that all legal provisions are properly and actively enforced. This is a pre-requisite for any cultural change in business practises and can only be achieved if all relevant authorities on national level are equipped with the necessary means and resources, taking advantage of the possibilities provided by digitalisation. In a globalised world, international cooperation between countries is growing in importance as well, in particular regarding e-commerce, reliability of EPR schemes, and informal international waste flows.

- Implement effective enforcement of already existing and new legal provisions especially with regard to compliance of EPR schemes, collection quality from consumers and municipalities, recycling quality, treatment standards and uncontrolled waste flows.
- Assure enforceability of targets and obligations.
- Set up independent national authorities which operate producer registries, monitor compliance of all actors, and ensure proper implementation of EPR and a level playing field among PROs.
- Intensify cross-border cooperation and mutual support between countries, e.g. through global “enforcement networks”, to combat free-riders and other non-compliant actors and to control cross-border sales.

3.8.6 Promote research and development

In EPR as in many other fields, innovation is key: products need to become more durable and better recyclable; collection, separation and recycling of waste products and packaging need to be significantly improved; and consumption behaviour needs to become more resource-efficient. Innovation in these fields require – besides a competitive environment – continuous research and development, both in publicly financed research institutions and in privately financed business projects.

- Regularly assign sufficient public budgets for research and development, in order to foster innovation with regard to waste prevention, recycling technologies, digitalization or new business models.
- Use penalty payments obtained through non-compliance with existing rules and provisions as source for public research and development funds.
- Redirect state subsidies from linear businesses to innovative circular businesses and research and development.

Support start-ups to incubate new ideas and “out of the box” thinking and facilitate the communication around them to get attention.

4. Considerations for a packaging EPR scheme in Egypt

4.1 Important reasons to consider in an EPR scheme

EPR has demonstrated its performance in reducing the amount of waste being illegally disposed, being disposed in an uncontrolled way, going to landfill and increasing the amount of waste recycled to raw material or recovered through energy recovery. As such, it can be proper response for Egypt.

WMRA is also considering the implementation of EPR on additional product streams in particular those generating hazardous waste after use, such as:

- Electrical and electronic appliances;
- Batteries;
- Paints and other dispersed chemicals.

Through various works initiated in 2014 with yet a GIZ mission, EPR has been identified as a suitable instrument for reducing waste in Egypt.

In 2014, an initial workshop on Sustainability in Solid Waste Management addressed EPR for Packaging Waste in a dedicated working group consisting of 18 representatives of the concerned entities.

The working group concluded on the difficulty to achieve an accurate count of potentially obligated parties, i.e. producers (brand owners of manufactured products) and manufacturers of packaging material. This difficulty was due to the fact that some actors are not registered with either chambers of commerce or the Federation of Industries. A source of information mentioned was the Industrial Development Authority (IDA) in that it delivered and register the licenses.

The participants also mentioned that the Organization for Standardization and Quality has a clear definition for the packaging materials and it has special standards for such materials as well as any other product to be recycled or manufactured and each industry should be dealt with separately due to the different types of packaging.

A key aspect of the economic landscape was the role of the informal sector (or parallel economy), which was deemed to represent a significant, although not quantifiable, obstacle to the application of any new mechanism.

Therefore, inclusion of said informal sector would be a success factor to any EPR initiative.

In conclusion, the attendees agreed on the importance of applying the EPR principle in Egypt and visualizing mechanisms for its application as well as setting a schedule for that. They also agreed on the need to form a committee of the concerned parties to immediately start the consultation and visualize how to apply the EPR, especially in the areas of packaging and electronics.

However, despite such positive conclusion, there seems to have been no further engagement on the topic until the mission object of this report.

Beside WMRA's support of EPR as an instrument to tackle the solid waste issues in Egypt, there is also an overall positive feedback from the private sector.

There is a current initiative focusing on plastics that is being developed as an informal coalition of FMCG producers (Unilever, PepsiCo, Coca Cola, P&G and Nestlé) and a PET recycler (BariQ). This coalition is ready to welcome additional member. The existence of this coalition could facilitate the start up of more formal EPR initiative.

Private sector input

Main concerns and expectations of the private sector are summarized as follows:

- The scope and objectives of EPR should be set by the government and debated in a multi-stakeholder approach.
- Clear regulations where every stakeholder is held accountable are required.
- All producers should be treated equally in order to avoid distorting competition.
- Freeriding is a strong concern and should be addressed by regulations and enforcement .
- Enforcement is the responsibility of the national authorities.
- The regulatory framework should also favour closing the loop, for instance in a bottle to bottle scenario.
- Policy requiring minimum recycled content in new packaging are considered favourably.
- Similarly, reliance on strictly virgin materials could be dissuaded through relevant instruments.
- Deposit systems are not considered adapted to Egypt situation at this stage.
- Europe's EPR system offer a good source for inspiration.
- A PRO is favourably considered vehicle for EPR, with a preference for specialization (i.e. one for packaging, one for e-waste for instance).
- PRO should be under the direct or indirect governance, and possibly ownership of the private sector, likely the obligated producers or their representative associations.
- PRO should focus on operating in a cost-effective and efficient manner.
- As PRO would operate in a pre-competitive dimension, competing producers can operate together a PRO for the collective good. There is no perceived need for competition at PRO-level at this stage.
- An operational PRO is preferred over a financial PRO, and a PRO over a tax-collection system.
- It is envisaged that the PRO would have to invest in the development of the recycling infrastructure (for instance, there is not HDPE capacity in Egypt).
- PRO should be a not-for-profit operation, for instance an association.
- Shared responsibility as an option should be discussed.
- Perceived challenges for implementation are:
    - Consumer awareness (though it appears to be growing);
    - lack of waste collection infrastructure;

- no waste segregation
- Consumer awareness (though it appears to be growing);
- lack of waste collection infrastructure;
- no waste segregation.

Above points require further discussion with both public and private stakeholders.

4.2 The status of the legal framework

4.2.1 Legislative hierarchy of Egypt

The legislative hierarchy refers to the order of legal rules or regulations by degree from higher to lower depending on the issuing competent authority.

In enforcement of these regulations, it is important to abide by this order. The known hierarchy includes the constitution, followed by laws and then subordinate regulations.

It also includes international agreements, whose rank in the hierarchy varies according to the legal system. For instance, the Egyptian Constitution assigned agreements the same rank as laws. The Egyptian legislative pyramid includes the following hierarchy: constitution, law, presidential decrees, prime ministerial decrees, ministerial decrees and finally decrees of heads of subordinate authorities.

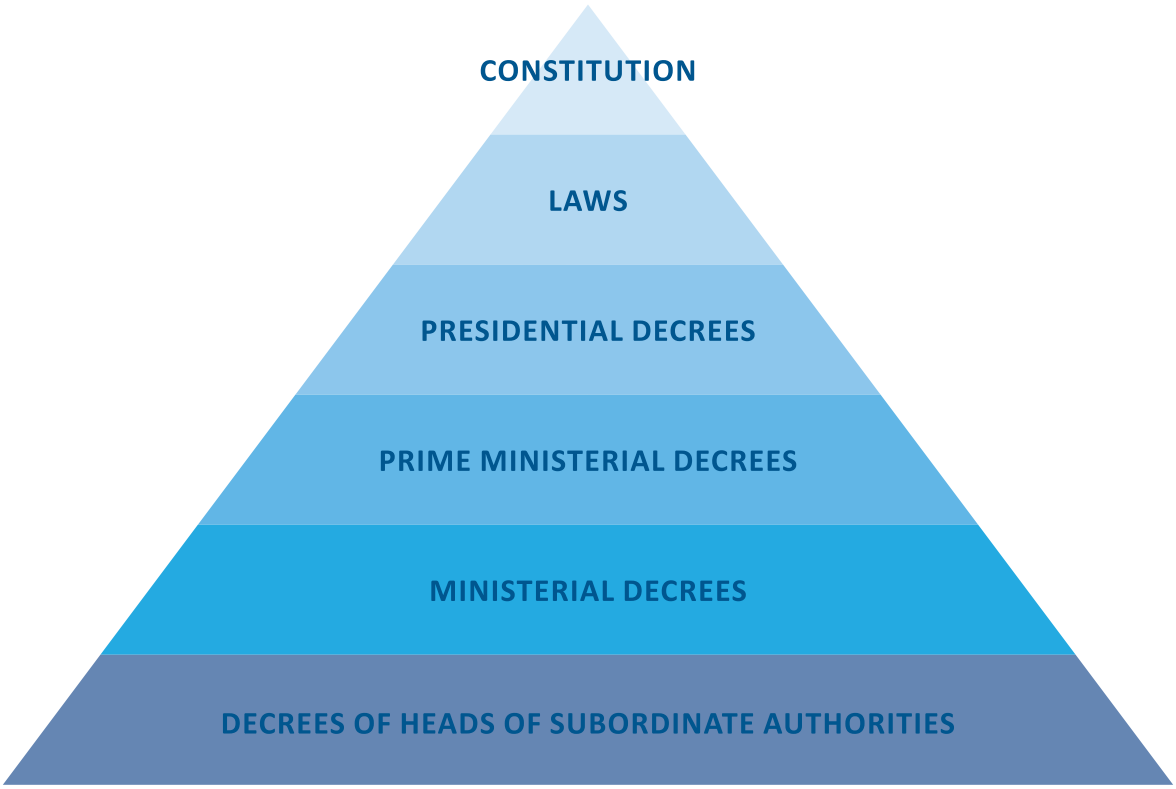

Figure 6: Egyptian legislative hierarchy (Source: Landbell AG, 2021)

4.2.2 Stages and categories of the legislative system

The next sequence represents the different Legislative Power of every Authority and the extent of the harmony between them.

I - The Legislative Authority (Parliament) issues Legislations in consistence with the Constitution. The Egyptian Legislative has recognized two types of Legislations:

1. Subjective legislations, which apply to all the members of the society or any relevant issue that comes within its range of application, i.e., the Commercial Law, the Labour Law…etc.
2. Procedural or private legislations, which are usually issued as an expression of the State to enter into an agreement for a public interest. The Parliament performs this expression through its members in the form of a Law.

II - The Administrative Authority (Government) implements the Legislations and issues Regulatory Statutes Prime Minister's Decrees, Ministerial Decisions & Acts of Governors to regulate the execution of the Legislations in consistence with both the Legislation and the Constitution.

III - The Judicial Authority is the designated Authority to monitor, observe, supervise the application and deal with any dispute that may arise out of the execution, interpretation or issuance of Legislations and Regulatory Statutes.

4.2.3 Legislative drafting process in Egypt

Legislation is classified into two categories: primary legislation and secondary legislation. Primary legislation includes the Constitution, laws, legislative decrees, and treaties and agreements. According to the Egyptian Constitution, laws can be initiated by the Parliament, the Cabinet or the President. Secondary legislation is issued by the Executive, and can be further categorized into three types:

- Executive legislation: These include detailed rules necessary to implement laws which tend to provide the general rules concerning the issue under regulation to ensure flexibility. Executive regulations are issued by the prime minister unless the law specifies who shall issue the regulation (Egyptian Constitution, Article 170, 2014). As they are issued by the Executive Authority, these regulations can be amended or repealed easily compared to laws which are issued by the parliament.

- Organizational legislation: These can only be issued by the prime minister, after approval of the cabinet, to organize public utilities and authorities (such as establishing authorities or agencies, specifying their mandate and functions, or abolishing them) (Egyptian Constitution, Article 171, 2014). Unlike executive regulations, these regulations are not issued based on an ordinary legislation.

- Control legislation: These are the rules laid down by the prime minister, after approval of the cabinet, to protect order and public health (such as regulations concerning food safety) (Egyptian Constitution, Article 172, 2014). They do not implement a specific law.

4.2.3 Understanding and functions of the legislative framework

Understanding the hierarchy of laws helps with developing a clear and consistent legal and regulatory framework for elections, by ensuring the appropriate content and detail is contained in each level of hierarchy.

Table 1: The Legislative Hierarchy (Source: Landbell AG, 2021)

The Legislative Hierarchy (Understanding and Functions the Legislative Frameworks)	
Constitution	▪ The constitution comes at the top of the legislative hierarchy. It determines the fundamental rules of the form of the state, system of government and the form of government. ▪ It also regulates public authorities in terms of composition, competence, relations between these authorities and their boundaries. ▪ It defines the duties and fundamental rights of individuals and groups in society and safeguards them against state authority. ▪ The constitution sets out the terms of reference of the three powers (legislature, judiciary and executive) and should be strictly followed by laws, which lie below the constitution in the hierarchy.
Laws	▪ Laws refer to the collection of rules that maintain the social system, as they govern the behaviour of individuals and their relationships. Respect of laws is ensured by virtue of the power of coercion invested in public authority. ▪ The president, any member of parliament or the government can propose laws. They are then referred to Parliament for discussion and vote. The president may object to the bill within 30 days of notification. If this period expires without objection, the draft is considered a law and must be issued. On the other hand, if there is an objection, the bill is returned for discussion and vote. Once again, to be approved it requires absolute majority vote by two thirds of the members. ▪ According to the constitution, the president could replace the legislature in issuing decrees that have the force of law in two cases: ▪ The first case is necessity. This arises when rapid action is required and it cannot wait. This could be at the time when parliament is dissolved or in recess (i.e. between sessions). ▪ The second case is when the parliament authorizes the president to replace the legislature in enacting decrees that have the force of law in issues specified in the authorization on grounds of precision, speed or confidentiality. The authorization must be approved by a majority of two thirds of the members of parliament people and for a specific period.

The Legislative Hierarchy (Understanding and Functions the Legislative Frameworks)	
Presidential decree	The President of the Republic may issue presidential decrees on the matters regarding executive power. But he is not authorized to: ▪ No presidential decree shall be issued on the matters which are stipulated in the Constitution to be regulated exclusively by law. ▪ No presidential decree shall be issued on the matters explicitly regulated by law. In the case of a discrepancy between provisions of the presidential decrees and the laws, the provisions of the laws shall prevail and the presidential decree shall become null.
Prime ministerial decrees	▪ The Prime Minister issues the decisions necessary to establish and organize public facilities and interests, after approval of the Council of Ministers. ▪ The Prime Minister issues the regulations, after approval of the Council of Ministers
Regulations and ministerial decrees	▪ A form of delegated legislation, developed and enacted by ministers, department heads, or by an independent body or commission, to administer their responsibilities with adhere to the constitution and laws. ▪ Regulations and ministerial decrees have three types: · The first one is known as the executive regulation; it entails the legislative rules issued by the executive to ensure implementation of the laws passed by the legislature. The executive regulation does not have the power to repeal, amend, impair or exempt from the provisions of the law it was issued to implement. · The second type is known as regulations, which are issued by the executive to regulate public interest and utilities as the main authority mandated to manage them. · The third type is known as control of police regulation. ▪ They contain restrictions imposed by the executive on individual liberties to maintain security, peace and calm, and protect public health. Examples of such regulation include: traffic regulations, health and safety regulations, and regulations for street vendors.

The Legislative Hierarchy (Understanding and Functions the Legislative Frameworks)	
Regulations and ministerial decrees	▪ The ministerial decree, on the other hand, is a legal instrument issued by the competent minister based on the law, presidential or prime ministerial decree that empowers the minister to regulate a certain issue. ▪ According to the constitution, issue of regulation is one of the functions of the president or whoever he authorizes or whoever is specified by the law to issue the regulation. In the Egyptian legal system, the competent minister often issues the executive regulation of the law. Other regulations are exclusive to the president; in other words, he cannot authorize others to issue them. ▪ Also, executive regulations are of a higher degree than ministerial decrees if issued by the president or prime minister. This gives rise to the question whether the executive regulation issued by the competent minister has the same rank as other regulations issued by the minister. The answer to this is yes. This is because the executive regulation is based directly on the law that it is implementing, whereas other regulations could be based on a presidential or prime ministerial decree.
Decrees of the heads of subordinate authorities	▪ The administration in the subsidiary authorities may issue administrative and organizational decisions in a manner that is not inconsistent with laws and regulations.
Guidelines, Instructions, and Policies	▪ Terms such as “guidelines” and “instructions” are uncertain in meaning and can result in ambiguity, particularly with regard to enforceability. ▪ “Policies” are broad, informative statements of intent regarding principles to be followed, priority of programs. ▪ These should not be used as if they were elements of the structure. ▪ This is guides but is not used as elements in the structure of the hierarchy of laws. *(An example of this is the strategic directions for solid waste management policies in Egypt (2014)*

4.2.5 Current or proposed legal text impacting packaging or e-waste EPR in Egypt

With a quick review of the Egyptian legal system regarding EPR systems, there is almost complete absence of any direct legal aspects regarding the design or application of EPR systems according to the current legal framework.

Thus, EPR systems are not yet mandatory. The only types of responsibilities are related to waste and disposal, as well as responsibilities related to production, supply chain and business operations, as well as financial and procedural responsibilities of companies / entities.

Under the Egyptian Legal System, there are NO EPR provisions concerning packaging, batteries and electronic equipment. Consequently, The Egyptian Legal System does NOT recognize mandatory EPR.

This could be done by adding clauses to an already existing waste and/or production-related regulations.

This approach could be seen as preferable to the introduction of a new law, which may not be effective nor efficient under the complexity of Egyptian legal system.

The provider's responsibilities (in the EPR system) under the Egyptian legal system vary between waste and disposal related responsibilities covered by a set of laws, the most important of which are:

- Law no. 38 of 1967; Articles (1), (8) and (9)
- Law no. 48 of 1982; Articles (2) and (16)
- Law no. 4 of 1994; Articles (37), (69) and (84)
- Executive Regulation of Law no. 38 of 1967; Article (1)
- Executive Regulation of Law no. 48 of 1982; Articles (1), (2), (3), (4), (5), (6), (8), (9), (10), (11), (14), (49) and (50).
- Executive Regulation of Law no. 4 of 1994; Article (38)

There are responsibilities related to the production, supply and import process covered by a set of laws, the most important of which are:

Commitment to Specific Standards

- Law no. 2 of 1957; Articles (1) and (5)
- Law no. 21 of 1958; Articles (14), (15) and (16)
- Law no. 118 of 1981; (9) and (11)

Liability for Producing or Importing or Supplying of Banned Products:

- Law no. 10 of 2003; Article (46)
- Law no. 4 of 1994; Articles (1), (29), (32), (33), (47), (85), (88) and (94)
- Executive Regulation of Law no. 4 of 1994; Article (25)

Providing Certain Information on Products

- Law no. 67 of 2006; Articles (1), (3) and (24)
- Executive Regulation of Law no. 67 of 2006; Articles (3), (4), (5), (6), (7), (12), (19) and (20)

Establishing a Customer Service and Repair Center

- Law no. 21 of 1958; Article (15)

Warranty and Liability for Defected or Damaged Products

- Law no. 17 of 1999; Article (67)
- Law no.131 of 1948; Article (447)
- Law no. 67 of 2006; Articles (1), (7), (8), (9) and (24)
- Executive Regulation of Law no. 67 of 2006; Articles (3), (4), (5), (6) and (7) (7)

Liability for Fraud and Deception

- Law no. 48 of 1941; Articles (1), (2), (3), (3), (4), (5) and (10)

This is in contrast with financial and procedural responsibilities covered by a set of laws, the most important of which are:

Payment of Customs Duties

- Law no. 66 of 1963; Articles (5), (11), (13) and (121) (2) Payment of Sales taxes
- Law no. 11 of 1991; Articles (2), (3), (5), (6), (8), (41) and (43) (3) Payment of Income Taxes - Law no. 91 of 2005; Articles (17), (19), (21), (22) and (133)
- Law no. 120 of 1982; Article (9)
- Executive Regulation of Law no. 120 of 1982; Article (10)

Issuance of Permits and Licenses and Paying the Required Fees.

- Law no. 21 of 1958; Articles (1), (5), (6) and (16)
- Law no. 453 of 1954; Articles (2), (3), (7), (10), (11), (17) and (18)
- Law no. 91 of 1991; (74) and (75)
- Law no. 11 of 1991; (18)
- Executive Regulation of Law no. 21 of 1958; Articles (1), (3), (7) and (8).
- Law no. 10 of 2003; Articles (44), (48) and (77)
- Executive Regulation of Law no. 48 of 1982; Articles (14), (15), (16), (22) and (34).

This is in relation to what came in the laws and executive regulations and does not include many ministerial, administrative and organizational decisions.

Under the Egyptian Legal system, there are no provisions related to EPR especially take-back systems regarding packaging and there is no responsibility, physical or financial, on the provider at the end of the product useful life.[2]

A draft law to regulate waste management:

The draft law is a part of the general Provisions – Article (1) - pointed out some definitions, including:

[2] BUILDING INCENTIVE BASED INCLUSIVE EPR SYSTEM IN EGYPT: Mapping Electric and Electronic Equipment take back chain -For CEDARE 2015

- **Item (29)- Definition of recycling in the new waste law:**

  A process whereby the waste is treated in a way that allows it to be reused again for purposes other than the one in which its origin was previously used.

- **Item (37)-EPR:**

  The producer is responsible to bear the costs of managing the product during its life cycle - total or partially -, including the post-consumption phase such as collection, recycling and final disposal of the product.

The draft law is still awaiting discussion in Parliament (perhaps Parliament will not be able to discuss it this year).

National Strategic Directives for Waste Management in Egypt) November 2014)

These Strategic Directives were developed within the context of the role of the Ministry of Environment defined by the Environmental Protection Law No. 4/1994, amended by Law No. 9/2009, which stipulates the Ministry's responsibility for policymaking and preparation of strategic plans required for environmental preservation and development in coordination with competent administrative authorities.

These Strategic Directives are a result of a comprehensive evaluation of the current state of solid waste management with a vision for a future relationship between the environment, waste and the society with the purpose of preserving public health and the environment. These Strategic Directives stress on the need to build a successful, comprehensive, and sustainable SWM system that is capable of handling the issue in an integrated and economic approach. A system that aims to achieve acceptable environmental and health standards through proper planning and allocation of necessary resources and constituents, with diligent implementation.

The Strategic Directives were prepared in line with the National Strategy 2030. These Strategic Directives represent the basis for a series of integrated measures aiming at holistic and sustainable reform and regulation of the Egyptian SWM sector. These measures are based upon international best-practice applied at the Egyptian political, legal, institutional, social, and financial contexts.

The framework outlined by the National Strategic Directives for Waste Management will support the development of new laws, guidelines, standards, institutions, professional capacities, data reporting requirements, and awareness & education programs dedicated to Integrated Solid Waste Management (ISWM) and guided by Good Governance principles. Importantly, the Strategic Directives also adopt an inclusive approach towards the informal actors based upon recognition and integration of such informal capacities and preservation of their livelihoods.

EPR for sustainable SWM was one planned objective to implemented in the medium term and the Producers are to have a legal and financial responsibility throughout the lifecycle of their product. Unfortunately, these strategic directions have not been implemented yet.

4.3 Proposed roles and responsibilities of public and private stakeholders

Stakeholder consultation suggests that a consensus can be developed around the establishment of a privately-owned, not for profit, producer-funded, operational take-back PRO to develop packaging waste collection in Egypt with a gradual deployment from an initial pilot to a nation-wide operation.

A prerequisite for a successful EPR (and PRO) operation is a clear set of regulations, detailing without room for interpretation the roles and responsibility of the various stakeholders.

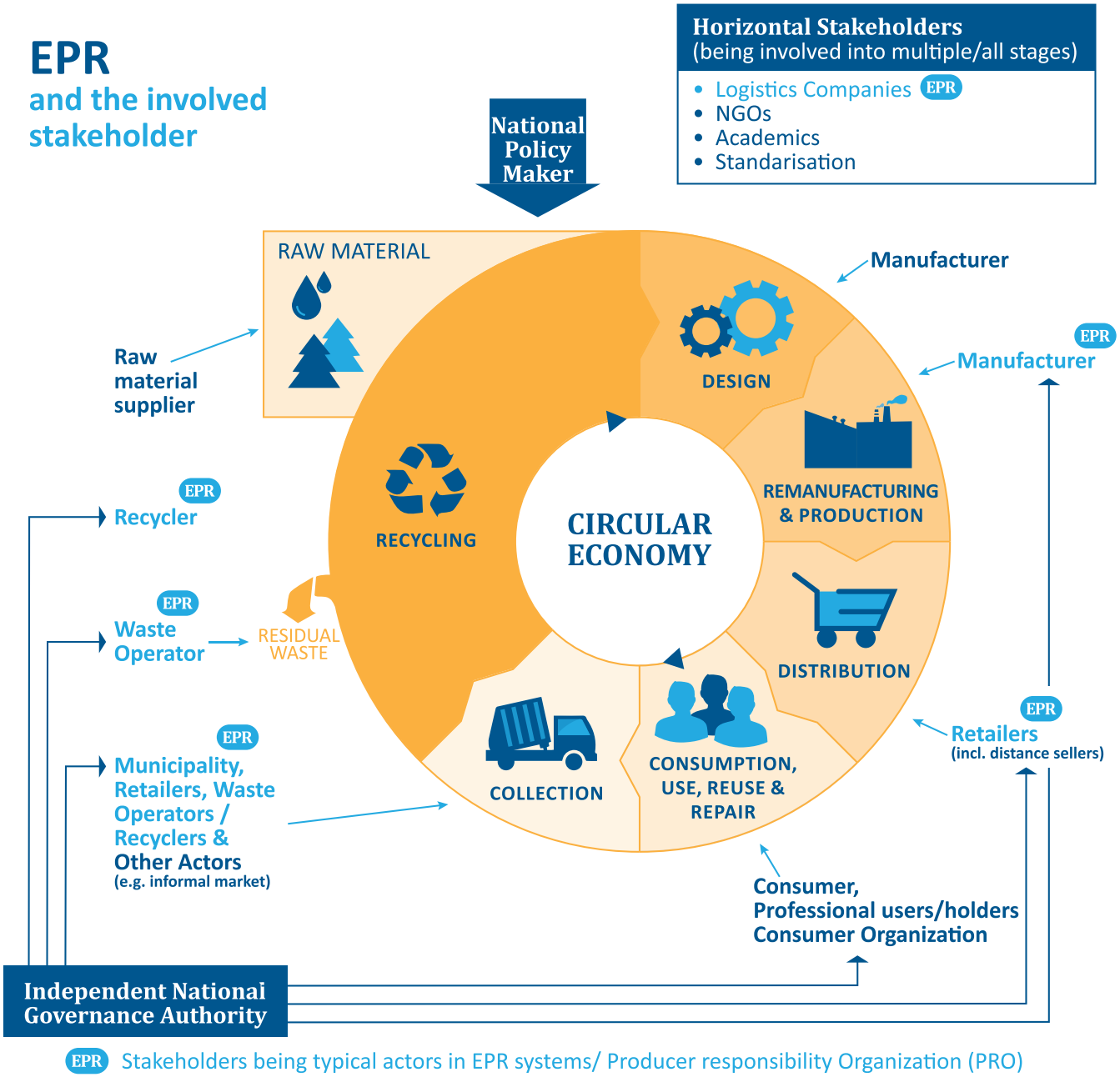

Figure 7: Prerequisite for a successful EPR (and PRO) operation. (Source: europarl, 2020) [3]

[3] http://www.europarl.europa.eu/resources/library/images/20150703PHT73954/20150703PHT73954_original.jpg

In Egypt, key stakeholders are:

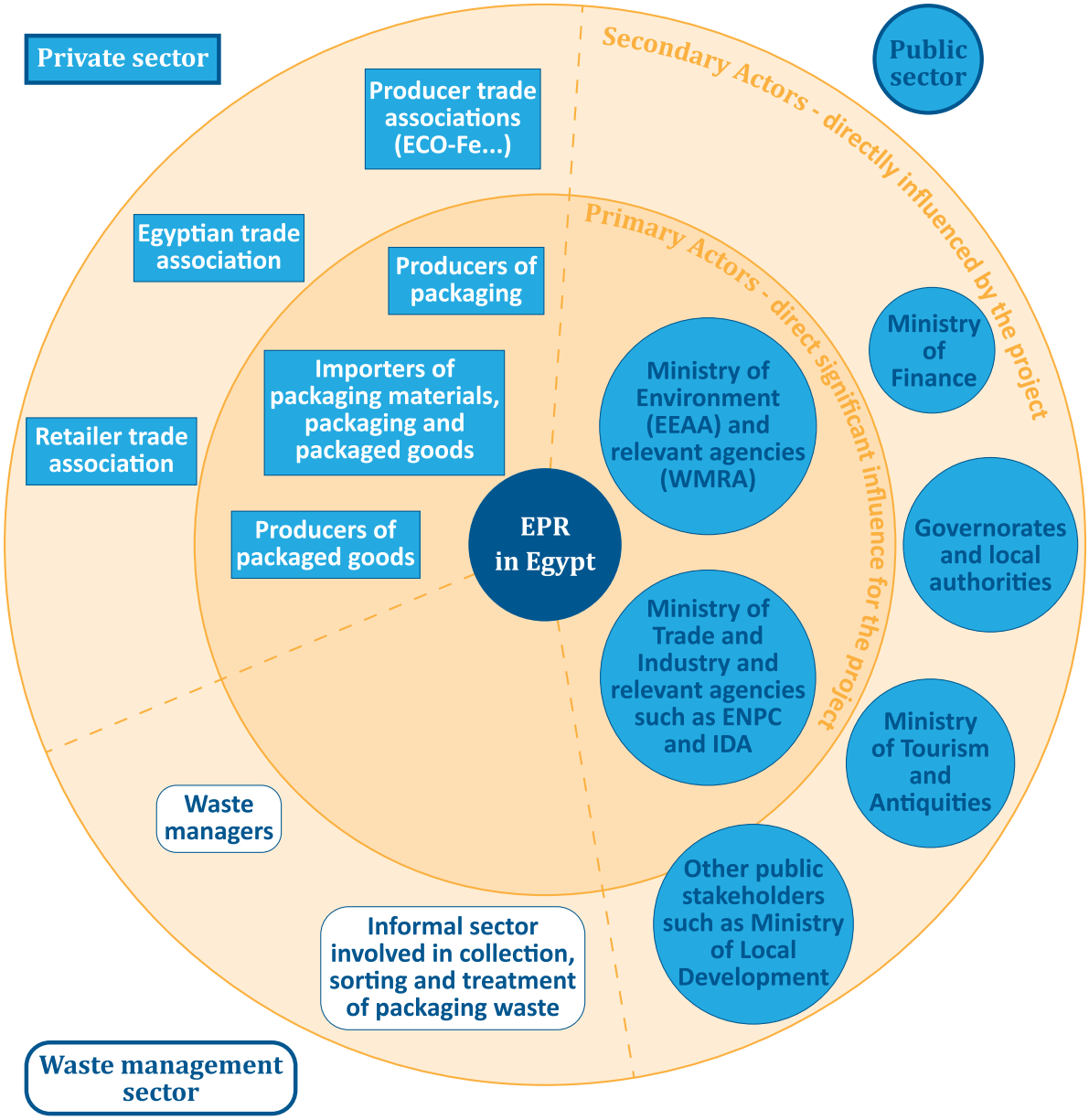

Figure 8: Stakeholder Mapping of an EPR scheme in Egypt (source: Landbell, BFS, 2021)

4.3.1 Ministry of Environment

Under such a set-up the responsibility could be distributed as follows:

a. Set policies/rules/targets addressing all life stages such as:

- Product design: legal minimum standards and incentives;
- Life-cycle process: EPR, waste transport, waste treatment & recycling in a dynamic and competitive market environment.

b. Publish a set of rules defining the roles and responsibilities of each stakeholder.

c. Publish auditable minimum requirements for Producer Responsibility Organizations (implementing the EPR).

d. Controls of PROs and other actors collecting (including "informal sector") vs. performance and compliance with minimum requirements for PROs.

e. Assure transparency, efficiency, competition and "good governance" of EPR systems (via audits and competition authorities if applicable).

f. Combats:
   - conflicts of interests among stakeholders;
   - free riding through suitable sanctions;
   - illegal exports.

g. Maintains a list of compliance-controlled waste collectors, sorting centres and recyclers.

h. Set reporting requirements for reporting system.

i. Facilitate exchange of best practice.

j. Promote R&D into new recycling technics by facilitating stable market conditions which make it worth for waste operators to invest into new machines and ideas.

4.3.2 WMRA

a. Register and monitor all actors (producer, Waste Collectors, Sorting Centers or Recyclers and other relevant waste operators, incl. PROs) in a transparent way (national register or through PRO if applicable and practical).

b. Ensure a level playing field among all actors (collecting/waste treating parties incl. PROs) such as:
   - transparent permission process;
   - fair access to waste;
   - transparent, non-discriminatory and competitive tenders (for services such as collection, sorting and treatment);
   - clearing of over-/under collection (clearinghouse) in case of multiple PRO.

c. Directly manage non-compliances or if not possible, report monitored non-compliances to National Enforcement bodies:
   - Monitor all actor's performance (collecting/waste treating parties incl. PROs);
   - Audit PROs regularly through a transparency and efficiency assessment;
   - Audit collecting/waste treating parties or in coordination with National Enforcement bodies.

d. Facilitate exchange of best practice among all actors (collecting/waste treating parties incl. PROs).

e. Clarify products in scope of an EPR stream.

4.3 3 Producers and trade associations

a. Design and manufacture products that follow the requirements set by the policy makers (material composition, design and labelling) and aiming for products that:
    - are energy efficient;
    - are easy to recycle;
    - use recycled materials.

b. Register in the Producer Register run by WMRA or the relevant PRO.

c. Ensure and finance a proper and legal management of specified waste streams within the scope incl. ensure the recovery and recycling of assigned volumes through the PRO or an individual solution as applicable.

d. Join a collective PRO or setup an individual system following same requirements as being applicable for PROs.

e. Fulfil information obligation in relation to end-users at least according to legal requirements incl. information/instruction to consumers on “How to dispose?”.

f. Provide information about the quantity of specified products placed on the market and the necessary details (such as weight of products/materials) as being specified by the PRO (if having decided for a collective management) or by WMRA.

g. Keep and retain records and reports.

h. Support policy making in a stakeholder consultation.

4.3.4 Retailers (including distant sellers)

a. Fulfil all manufacturer requirements if acting as “producer” by putting product onto the market (e.g., importer).

b. Collection of waste packaging.

4.3.5 Waste managers (including informal sector)

a. Support PROs and producers in achieving the regulatory targets.

b. Gather waste separated according to types and secure it against deterioration, theft or other undesired movement.

c. Ensure that sorting and treatment of waste from any source follows the relevant process.

d. Ensure waste traceability regulations and good practices are met at all times including by reporting the recorded data as appropriate to the EPR/PRO or if not applicable (i.e. other actors) to the Independent National Governance Authority.

e. Carry out audits checking quality and compliance of their first-tier suppliers in accordance to quality standards + take appropriate corrective actions in case of non-conformities.

f. Enlist with the registry as an approved Recycler/Waste Operator.

4.3.6 Producer Responsibility Organisation

a. Create, finance, operate and maintain a functional system of collective management of a specified waste stream.

b. Enter into, under non-discriminatory conditions, contracts with related producers.

c. Manage one or several specified waste stream(s) on behalf of the represented producers to an extent corresponding to the aggregate volume of the obligations of each individual represented producer transferred to the responsible producing organization.

d. Support or carry out audits checking quality and compliance of their first-tier suppliers in accordance to harmonized standards + take appropriate corrective actions in case of non- conformities.

e. Incentivize producers following the harmonized principles "incentives for better designed products" set by the policy makers.

f. Fulfil on behalf of all represented producers their documentation obligations such as:

- registration and reporting obligations;
- keep reporting records separately for each represented producer;
- regularly submit summary reports to WMRA on behalf of all represented producers and retain the reported data:

  - information about the quantity of the specified waste stream for which they provided collection, transport, preparation for reuse, recovery, recycling, processing and disposal;

  - information about the quantity of specified products placed on the market by the producers that they represent.

g. If not managed by WMRA, regularly verify the accuracy of the data provided by the represented producers.

h. Report under-/overcollection quantities to WMRA and contribute to a fair sharing and financial compensation, in case of competing PRO.

i. Support or carry out nationwide promotional and educational activities focusing on end- users concerning separate collection and waste prevention.

j. Finance R&D projects to improve collection, recycling rates, reuse.

k. Support of EPR policy making in a stakeholder's consultation.

4.4 Factors affecting the deployment of an EPR scheme

Known key factors hindering the proper implementation of an EPR system for packaging are:

a. The lack of a clear and executable regulatory framework EPR.

b. Incomplete or conflicting regulations defining recycling and use of recycled materials or affecting cross border waste movements (import and export).

c. The absence of a pre-existing municipal collection infrastructure that be primed for segregated collection of waste and in consequence to the absence of a waste separation culture / related public awareness.

d. The prevalence of the informal sector in waste collection which represents both a constraint and an opportunity.

e. The absence of automatic sorting and recycling infrastructure / capacity for certain waste fractions.

Under an EPR scheme the cost of post-consumer handling is passed on to the producers. Therefore, producers should have ultimate responsibility for the funding of the packaging EPR scheme.

Typically, producers should fund through their PRO:

- Net cost of take back, sorting and recycling operations (once netted of raw material revenue).
- Education and awareness.
- Quality assurance programs.
- Data reporting systems:
  - For the products placed on the market and calculation of respective producer obligations;
  - For operations;
  - Such reporting system would feed in part into the registry managed by WMRA unless the registry role would be played directly by the PRO.
- Financial contributions to potentially central bodies such as registry, independent body, clearing house.
- Infrastructure development support, partly (as subsidies, R&D programs…) or wholly if necessary for lack of private sector investment.
- Overheads which composition would vary according to the scope of work of the PRO:
  - Whether financial or operational;
  - Whether missioned with awareness and education, R&D, etc.

In the particular case of Egypt, considering the key factors mentioned above, a practical set-up could be built around, initially a single PRO for all packaging materials:

- Operating as a private entity under direct or indirect governance of producers.
- With a mission to develop and manage the overall take-back operations.
- Leveraging the informal sector for the first steps of the collection process.
- Fulfilling an initial and hence ambitious educational role.
- With an additional role to foster, through mechanisms yet to define, the development of the necessary sorting and the recycling infrastructure and identify recycled fractions recipients.

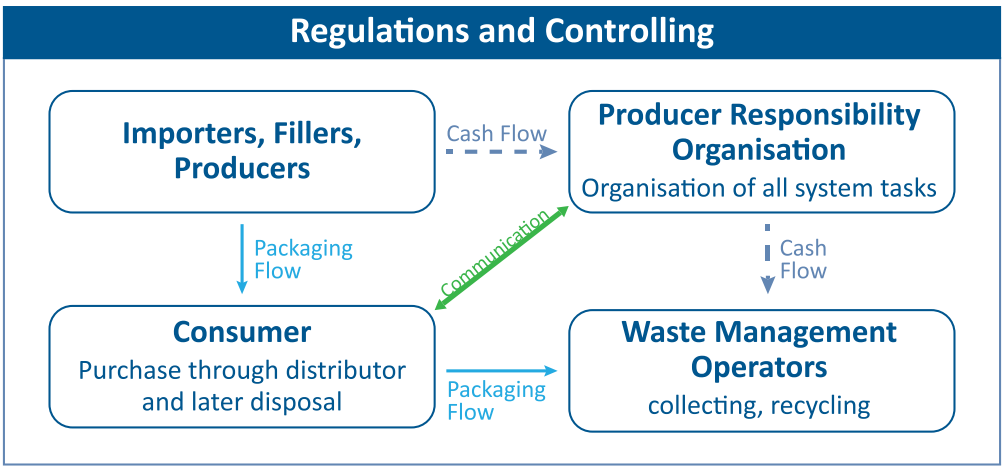

Figure 9: Single PRO system (Source: GIZ, 2019)

4.5 Outline for a PRO set-up

Based on the mission outlook described above, a relevant PRO organisation would include the following functions:

- General Management;
- Producer relationship management, ensuring the identification, contracting and reporting of the obligated producers, training of the producers, identification of free riders. This function also entails the calculation of the respective obligation of each producer, based on put on market data and/or market share;
- Strategic sourcing, ensuring the identification, tendering and contracting of the various service providers, especially for collection, sorting and recycling and including the informal sector;
- Operations Management, ensuring the efficient performance of the physical activities, related documentation and reporting;
- Communication management, ensuring the education and awareness of the public and the participants in the EPR system;
- Finance, overseeing the PRO finance and controlling activities;
- Quality and audit, verifying that the PRO and supply chain participants operate at the required quality levels and that producers declarations are accurate.

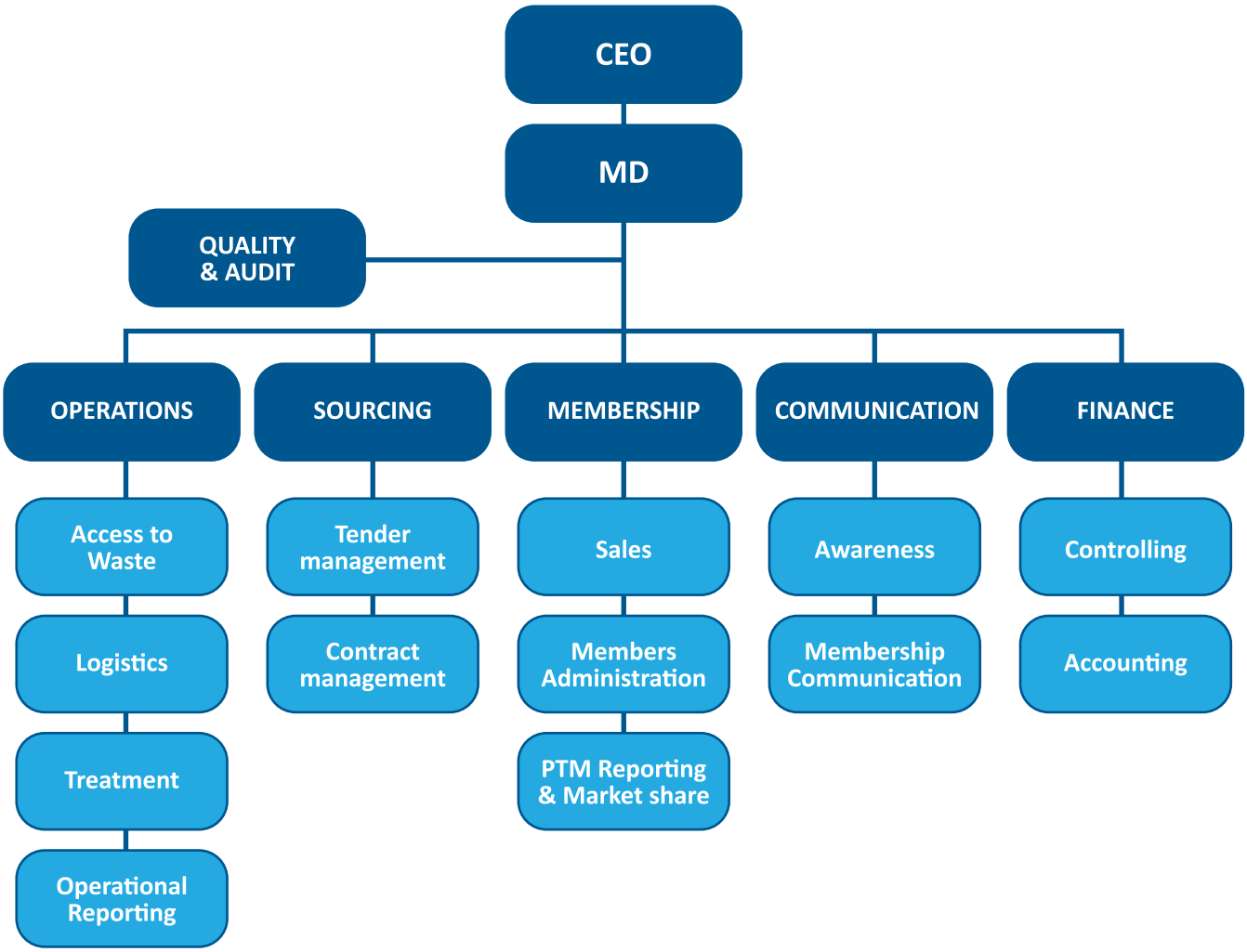

Figure 10: Functions of PRO (Source: Landbell AG, 2020)

4.6 Working with the informal sector

In the particular case of Egypt, the lack of already established municipal waste collection infrastructure and the prominent role of the informal sector in waste collection led to necessary inclusion of the latter for the success of the EPR system also avoiding social exclusion.

According to private sector stakeholders, previous initiatives of segregated packaging waste collection failed for lack of a proactively inclusive policy in favour of the informal sector. For instance, take-back huts were destroyed, and mall collection points failed to start their operation after influential action took place.

The Informal sector (Zabbaleens) is currently controlling collection, cherry picking and limiting volume in order to keep prices up. It is also involved in the collection and separation of solid waste, however, the process is not state of the art, leading to the release of micro plastics in the environment.

The Zabbaleens are able to collect 3 distinct quality grades of PET plastics. Zabbaleen organisation is multi-tiered:

- Top players are estimated at 4.
- Traders are estimated at 15 to 20.
- Informal sorting centres account for approximately 1,000.
- Pickers are estimated at more than 10,000.

It seems that engaging with some of the traders, offering them free equipment (for pre-sorting and consolidation) in exchange of a formal contract, favourable payment terms and volume commitment can provide some security on both volume and price.

5. Pilot case for packaging waste EPR in Egypt

5.1 Initial considerations for a pilot

Concept Note Pilot Scope
▪ The GIZ concept note's objective is the establishment of an EPR system of packaging waste in tourist areas as a contribution to a circular economy in Egypt. ▪ In practice, as per the ToR, the mission is expected to develop a pilot in the Red Sea area and a roadmap for deployment at national level.
Considerations
▪ During the first week of stakeholder engagement, the mission has identified support for the performance of the pilot, from the EHA or the MoT for instance. ▪ Some stakeholders have suggested alternative to the Red Sea area: South Sinai, High Egypt, Delta Area. ▪ GIZ would agree to relocate the pilot, under the following considerations: ▪ South Sinai is not favoured due to security concerns; ▪ Asyut and Qena are a possibility as GIZ already has solid presence there. ▪ It seems there is no recycling capacity in the Red Sea area, a pilot there would require waste transportation if aiming for an end-to-end pilot. Otherwise only an awareness, source segregation and collection pilot can be envisaged there. ▪ EPR implies producers by definition. While focusing on the tourist industry and a tourist area may have some merits from a pilot perspective, or even for a sector-specific national deployment, it is advisable to include producers. ▪ Producers should be understood not only as packaging producers (as mentioned in the concept note) but also packers and fillers, i.e., the companies to buy packaging for their products as well as importers of packed goods to Egypt. ▪ A coalition of producers and a PET recycler have already started working on voluntary initiative. ▪ Waste PET is becoming less of a commodity due to increasing adoption of SUP bans in Europe. ▪ Paper and cardboard recycling is a challenge in Egypt due to water shortage. ▪ Informal sector is heavily engaged in collection, sorting and pre-processing of waste packaging. ▪ There is demonstrated usage of flexible plastics waste in cement kilns. ▪ Textile industry is also a buyer of recycled plastics.

Pilot Blueprint

- Define scope of work:
  - Should it focus on the tourist population and/or the residential population;
  - Should it focus on the hotels only and/or also on households for collection;
  - What is the work breakdown structure:
    a. Information and awareness;
    b. Value chain documentation;
    c. Source segregation;
    d. Collection;
    e. Sorting;
    f. Processing;
    g. Utilization of recycled material;
    h. Reuse.
  - Part or all of the above components can be in scope, depending on the pilot goals.
- Define goals:
  - Value chain validation? Need to address at least collection to reprocessing;
  - Informal sector incentivisation? Need to address at least collection and sorting;
  - Data collection?;
  - Consumer behaviour progress over time? Need to address awareness and source segregation.
- Set location:
  - Red Sea area?;
  - Other location such as Asyut?
- Set duration:
  - Minimum duration 3 months for baseline study;
  - Duration> 6 months to measure behavioural progress.
- Define waste in scope:
  - Plastics;
  - Metals;
  - Paper/cardboard.
- Collect baseline information:
  - Existing awareness level;
  - Existing collection system;
    a. Reverse chain;
       - formal, informal players identification and role;
       - process;
       - type of infrastructure (containers, vehicles, sites.
    b. Waste segregation;
    c. Volumes;
    d. Values;
       - Prices paid for the various operations (by whom, to whom, how much).
  - Existing outputs;
    a. Re-processor (recycler, cement kilns...);
    b. Landfill.

Pilot Blueprint

▪ Stakeholders to be associated with the pilot:
  ▪ GIZ;
  ▪ Producers using the materials under pilot (plastics, etc…);
  ▪ Producers of packaging;
  ▪ Processors of waste to recycled material;
  ▪ Retailers and hotels as needed according to decisions made;
  ▪ Governorate / municipal staff engaged in waste issues;
  ▪ Representatives of the waste sector (formal and informal).
▪ Define pilot metrics:
  ▪ What is measured?;
  ▪ Are there targets to achieve?;
  ▪ Measure frequency.
▪ Define and source tools:
  ▪ Software;
  ▪ Training/awareness material;
  ▪ Operational equipment.

The key question here is whether the Red Sea area, as initially envisaged, is the most relevant territory. Further discussion with GIZ led to the understanding that areas like Assiut or Quena may offer a better ground for a pilot, due to pre-existing initiatives from GIZ, for instance. This should be decided after the workshop with stakeholders.

It also looks that a focus on the tourism sector, while providing attractive initial ground for development (as the sector is already acquainted with environmental initiatives through the Green Star programme) may not allow to capture a significant portion of the waste generated in Egypt, i.e. the waste generated by the residents themselves.

In addition, regardless whether focus stays on the tourism sector, it is essential to ensure the participation of producers to any initiative around EPR.

Once the area is decided, there will be a need to define:

- The pilot objectives and scope:
  - From source segregation to collection to sorting to recycling to remanufacturing;
  - Which materials are in scope: plastics, metals, cardboard;
  - The quantitative targets;
  - The measures;
  - The duration;
  - The participants;
  - The funding.

- The baseline for operations:
    a. How is waste currently collected;
    b. Who are the players;
    c. What is the value chain.

5.2 Additional considerations for a pilot

Further to additional consultation during three webinars involving both the public sector and the private sector, the following understanding has been achieved regarding the pilot:

- Location in a touristic area.
- Strong preference for a location where recycling infrastructure is pre-existing.
- Pilot should address all packaging flow with the view to prepare for national deployment.
- Main target is the tourism sector (hotels and resorts) but should / could also include households, also in the perspective of national deployment including in non-touristic areas.
- Pilot will encompass the entire reverse chain, from source waste segregation (in hotels and households) to industrial material demand.
- Pilot will also address awareness, education, and incentives for waste generators.
- Ground coordination and/or project management is expected to be ensured by an NGO with demonstrated presence in the pilot area and expertise in environmental and/or educational matters.

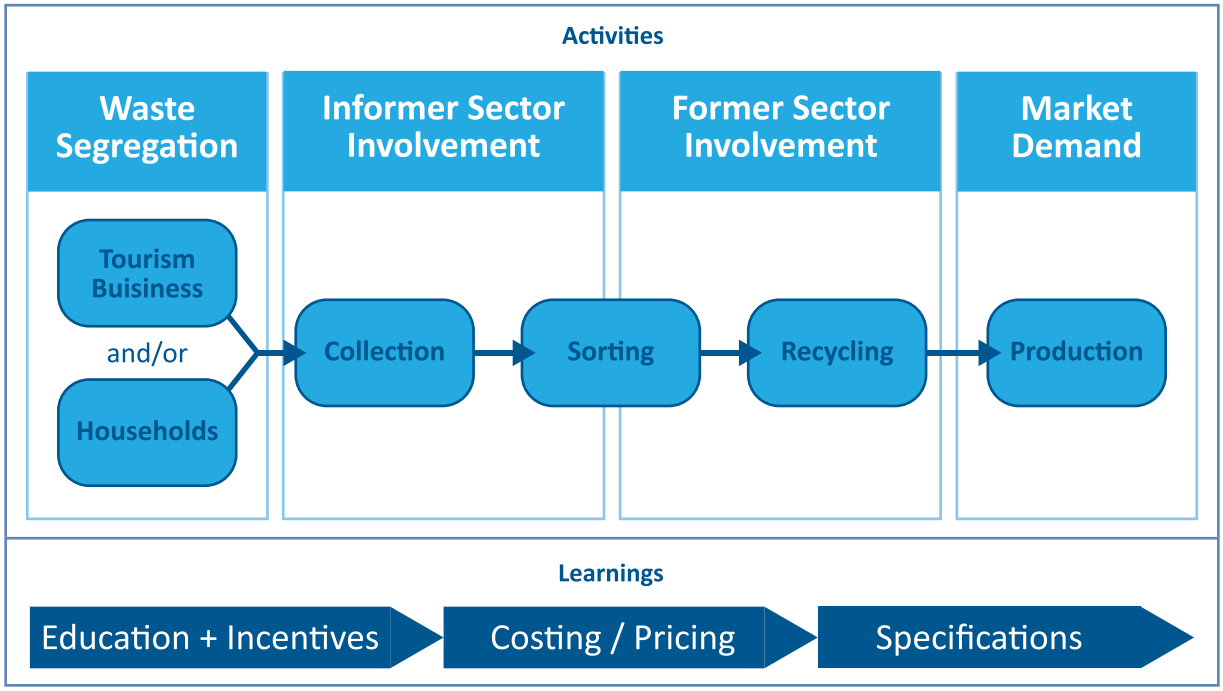

Figure 11: Considerations for pilot (Source: Landbell AG, 2021)

Indicators to measure the achievement

Key Performance Indicators for a pilot could include measurement against a baseline of the following metrics:

- Quality of source segregation (i.e., contamination level of segregated waste at the source be it a hotel or a household
- Collection volume vs. target
- Month on month collection growth
- Awareness growth

Overall, there is also a need to demonstrate the validity of the reverse chain from hotel/household to material re-entry into the production process (or alternative outcome like energy recovery).

The cost should be determined with the view to identify the parts that require producer/PRO funding to compensate for the lack of profitability or the volatility.

5.3 Selecting a location

5.3.1 Green Star Hotels

Considering the requirement of a touristic location for the performance of the pilot, it may be possible to leverage the pre-existing environmental sensitivity of the Green Star Hotels.

The “Green Star Hotel” Program is Egypt’s Green Certification Program in support of Sustainable Tourism. The Green Star Hotel (GSH) is a national green certification and capacity-building program managed by the Egyptian Hotel Association (EHA) under the patronage of the Egyptian Ministry of Tourism. The GSH program offers an opportunity for hotels operating in Egypt to be internationally recognized for raising their environmental performance and social standards while reducing their operational costs. A team of certified local and international experts guide interested hotels through a sequence of training and information support sessions leading to field audits to ensure compliance with the program standards prior to granting the GSH certification.

There is an opportunity to rely on certified hotels with the support of the EHA, in the selected location.

Such hotels have already engaged in formal activities to improve their environmental footprint and one can expect a positive response from their staff on the conduction of a pilot. If needed, specific incentives might have to be identified and implemented.

So far, Egypt is home to 86 hotels—totaling around 25,000 rooms (10 % Capacity) —that have obtained the Green Star Certificate that is awarded to hotels and resorts that comply with the rules and guidelines of the “Green Destinations” about 60% of them are in the Red Sea Governorate in cities (Hurghada / Safaga / Marsa Alam), and about 24% In the South Sinai Governorate in the cities of (Sharm El-Sheikh / Dahab / Taba).

Table 2: Distribution of green hotels according to places (Source: Green Star Hotels, 2021) [4]

Places	N°. of Green Star Hotels	Governorates
Madinat Makadi (Safaga)	11	Red Sea
Madinat Coraya (Marsa Alam)	8	
El Gouna (Hurghada)	16	
Hurghada	11	
Sahl Hasheesh (Hurghada)	1	
Marsa Alam	3	
Safaga	2	
Alexandria – Downtown	1	Alexandria
Alexandria – North Coast	1	
Sharm el Sheikh	14	South Saina
Taba	2	
Taba Heights	4	
Dahab	1	
Luxor	1	Luxor
Mersa Matruh	5	Mersa Matruh
Ain el Sokhna – Suez	1	Suez
Cairo	4	Cairo

[4] Source: https://www.greenstarhotel.org/

Table 3: Distribution of green hotels to Governorates (Source: Green Star Hotels, 2021) [4]

Governorates	Green star Hotels	
	N°.	%
Red Sea	52	61%
South Sinai	21	24%
Ersa Matruh	5	6%
Cairo & Ain El Sokhna	5	6%
Alexandria	2	2%
Luxor	1	1%
Total	**83**	**100%**

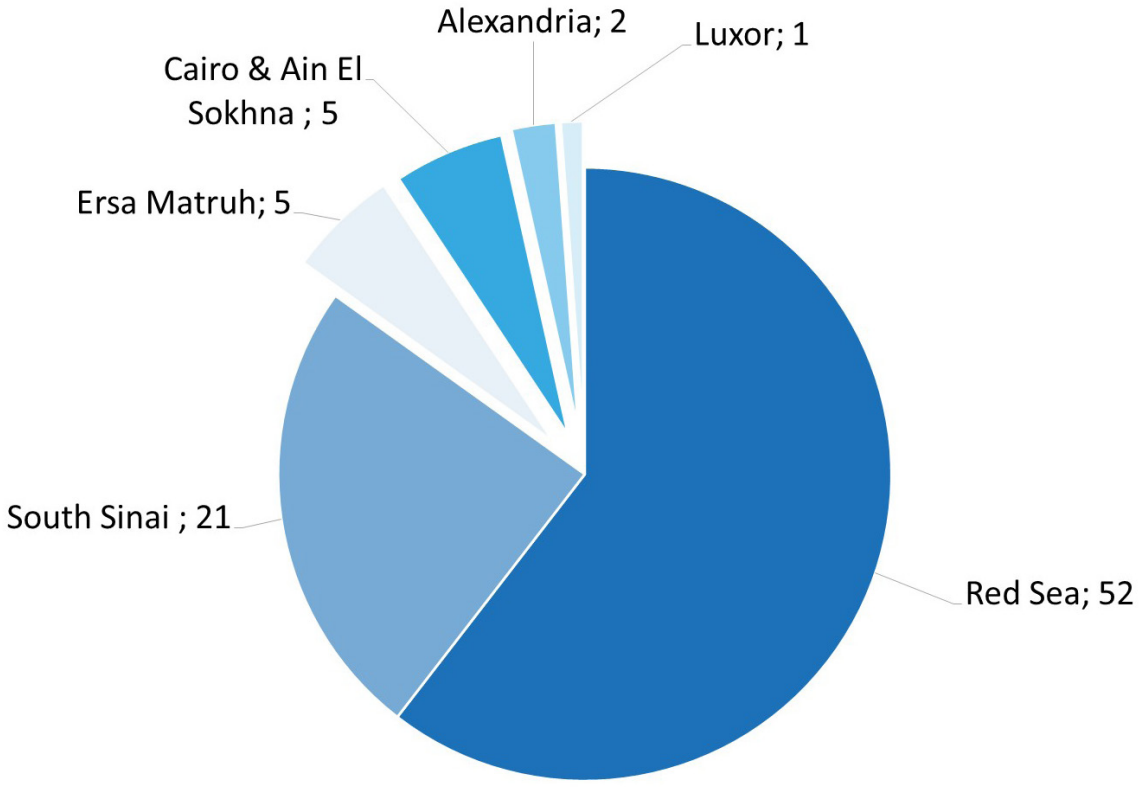

Figure 12: Distribution of Green Star Hotels to Governorates (Source: Green Star Hotels, 2021) [4]

Table 4: Distribution of Green Star Hotels to tourist cities (Source: Green Star Hotels, 2021) [4]

Cluster	Green Star Hotels	
	N°.	%
Hurghada & Gouna	28	33%
Safaga	13	15%
Marsa Alam	11	13%
Sharm El Sheikh	14	16%
Dahab	1	1%
Taba	6	7%
Marsa Matruh	5	6%
Cairo, Ain El Sokhna	5	6%
Alexandria	2	2%
Luxor	1	1%
Total	**86**	**100%**

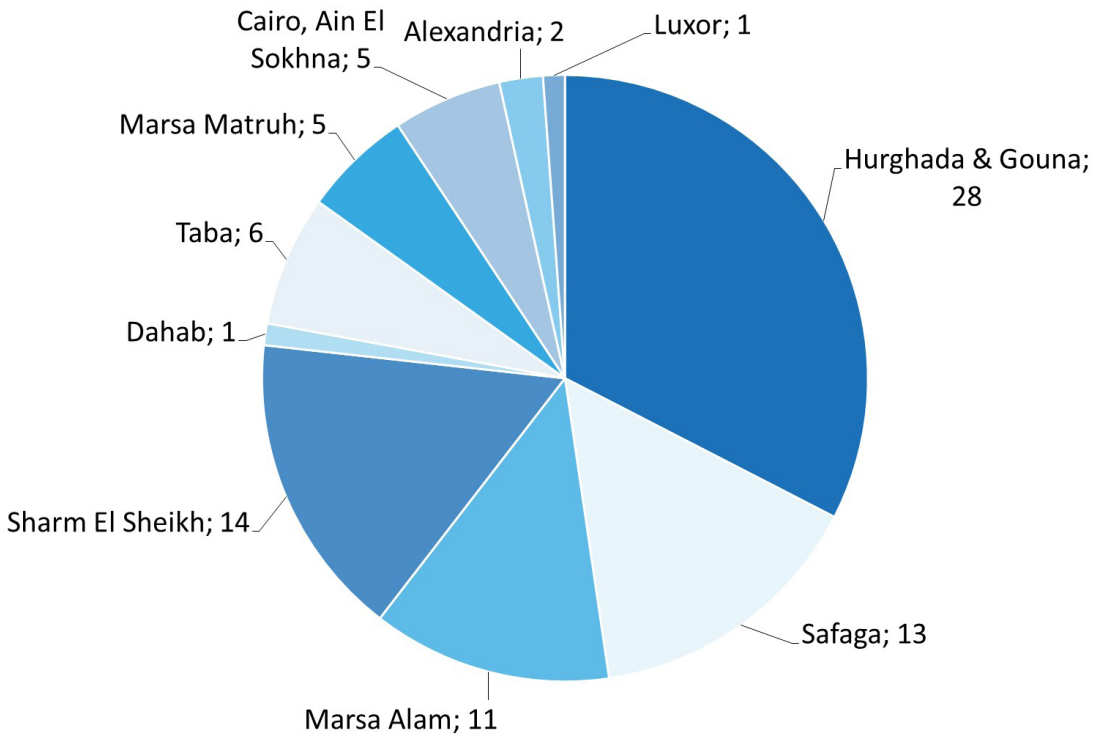

Figure 13: Distribution of green hotels to tourist cities (Source: Green Star Hotels, 2021) [4]

Based on above distribution, it appears that the Red Sea area and the South Sinai area present the highest proportion to Green Star Hotels.

This suggests that both these governorates should be compared in order to select the most suitable one, i.e. the one fulfilling the subsidiary requirements of pre-existing recycling infrastructure and presence of an active NGO who could provide field support and / or pilot project management.

5.3.2 Red Sea Governorate

The governorate is divided into 4 cities, including (Hurghada - Safaga - Quseir - Marsa Alam), and there is a non-tourist city (Ras Gharib - Halayeb and Shalateen). Hurghada is the capital of the governorate. Tourism in the Red Sea Governorate varies between recreational tourism (Diving, Snorkelling, kite surfing) or Climatotherapy & wellness centres or Historical tourism or Religious tourism.

Table 5: Demography of Red Sea (Source: Landbell, 2021)

Governorate	Area (km^2)	Population 2019	Capital	N°. of Cities
Red Sea	119,099	372,862	Hurghada	6

Table 6: Touristic clusters of Red Sea (Source: Landbell, 2021)

Cluster	Area (km^2)	Population	Number of hotels	Number of green star hotels
Hurghada	11,261	199,582	161	28
Safaga	5,739	53,335	55	13
Qusier	7,636	50,023	23	0
Marsa alam	38,433	8,797	46	11

Table 7: Classification of hotels (Source: Landbell, 2021)

Cluster	5 stars	4 stars	3 stars	2 stars	1 star	Under classification
Hurghada	27	49	42	21	13	9
Safaga	20	15	10	4	3	3
Qusier	2	8	4	2	0	7
Marsa alam	4	20	12	1	1	8
Total	**53**	**92**	**68**	**28**	**17**	**27**

Table 8: Distribution of green hotels to tourist cities (Source: Landbell, 2021)

Cluster	Green Star Hotels	
	N°.	% of the total governorate
Hurghada & Gouna	28	54%
Safaga	13	25%
Marsa alam	11	21%
Total	**52**	**100%**

Background on the tourist cities in the governorate

Hurghada City is the capital of Red Sea Governorate, it is one of the most important scuba-diving tourist destinations around the world It is located on the western coast of the Red Sea, 500km south-east of Cairo, and stretches for about 36 kilometres (22 mi) along the seashore, and it does not reach far into the surrounding desert. Hurghada is bordered by Ras Gareb in the north, Safaga in the south, Red Sea coast in the east and Sohag and Assyut Governorates in the west. Hurghada is merging the old with the new and boasts some of the finest hotel chains in Villages Road and the tourist districts around it like Sahel Hashish, or north of it and El-Gouna in the south. Most the inhabitants depend on tourism, and some of them work in fishing.

Safaga is a marine port located 53 km (33 mi) south of Hurghada. This small port is also a tourist area that consists of several bungalows and rest houses.

Safaga is reputable for its unpolluted atmosphere, black sand-dunes and mineral springs which have acquired specific characteristics for remedy of rheumatoid arthritis and psoriasis, all this attracts lots of tourists from all over the world to enjoy the fine atmosphere and wonderful beaches. tourist activity in the city varies from scuba diving to snorkelling, safari, kitesurfing, windsurfing and medical tourism, that's why Safaga acquires a number of reputable hotels.

The port of Safaga a main link between Egypt and Arab and Asian countries. It is used for exporting phosphate and importing grains, but the port is mainly used to transport Egyptian pilgrims to Saudi Arabia. Population in Safaga is more than 35.000, most of which work in tourism and fishing.

Qusier is a city in Egypt, it lies along the Red Sea. Its ancient name was "Leucus Limen" that means "the white port".Qusier is a city in Egypt., it lies along the Red Sea. Its ancient name was "Leucus Limen" that means "the white port".

Qusier is located 138 kilometers south of Hurghada, 139 km north of Marsa Alam and 73km north of the Marsa Alam International Airport. Hamrawain is a village that belongs to Qusier in the south. Quseir is a growing tourist city. It is popular among divers for its pristine and unpopulated dive sites, and well known for peaceful beaches and transparent waters, it contains a number of good hotels of different ratings. Phosphate is another main economic activity in the city especially in Hamrawain Village. The population is around 50,000 (2006 census). Some of this population work in fishing.

Marsa Alam was little more than a sleepy fishing village twenty-five years ago, but the region's beautiful beaches and its' virgin coral reefs are set to make it a prime holiday spot. It is about 280 km to the south of Hurghada. The city contains two villages (Shaikh Shazly and Baranees). The main economic activities in marsa Alam are tourism and mining.Recently, Marsa Alam has become a fast growing tourist city due to its fantastic beaches, tranquillity and wonderful climate and nature. Now Marsa Alam diving sites are among the most attractive diving sites in the Red Sea for experienced divers. As a result of these

characteristics, many high-standard hotels were built in Marsa Alam, so the city is ready for receiving more and more visitors.

Solid waste management in the governorate

Responsibility for collecting garbage, transporting and disposing of waste from the main and subsidiary streets to be assumed by city councils and transported to the public dump of each city. The governorate also adopts the Environmental Preservation Association (HEPCA) and 2 private sector companies to work in the collection and transportation of solid waste from residential and commercial units, industrial facilities and activities Hotel in the regions and transfer to the public dump of each city.

Table 9: Solid waste generated at the city level (Source: WMRA, 2018) [5]

City	Waste generated per day (tons)
Hurghada	363.5
Ras Gharib	78.3
Safaga	60.3
Al Quseir	37.4
Marsa Alam	31.6
Shalatin	10.6
Halayeb	6.8
Total	**615**

Figure 14: Solid waste generation at the city level in Red Sea Governorate (Source: WMRA, 2018) [5]

[5] Master Plan for SWM in the Red Sea – WMRA 2018

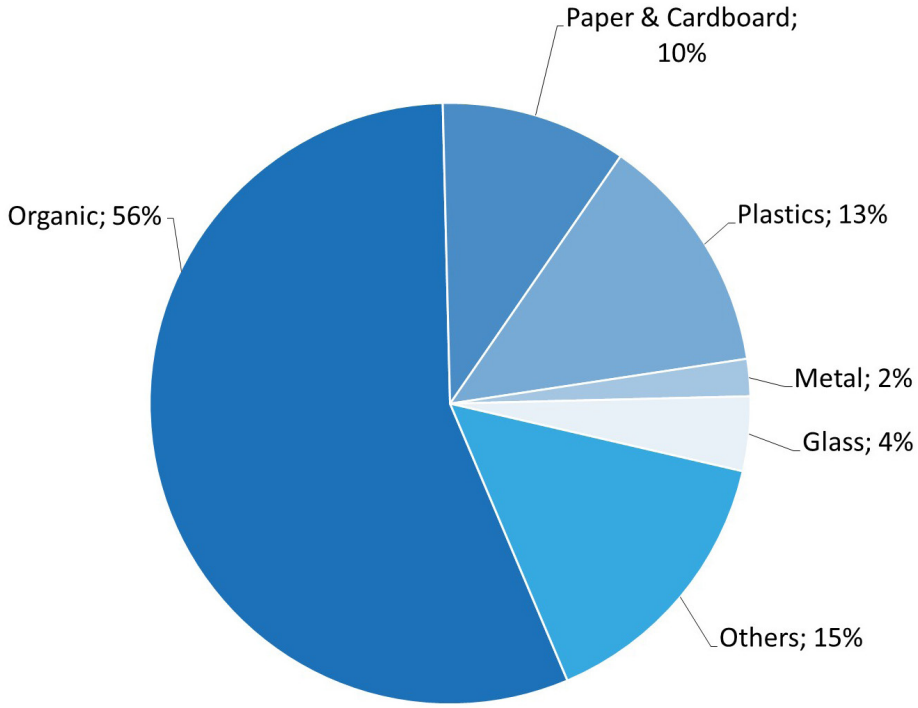

Figure 15: Waste composition in Egypt (Source: EEAA, 2016) [6]

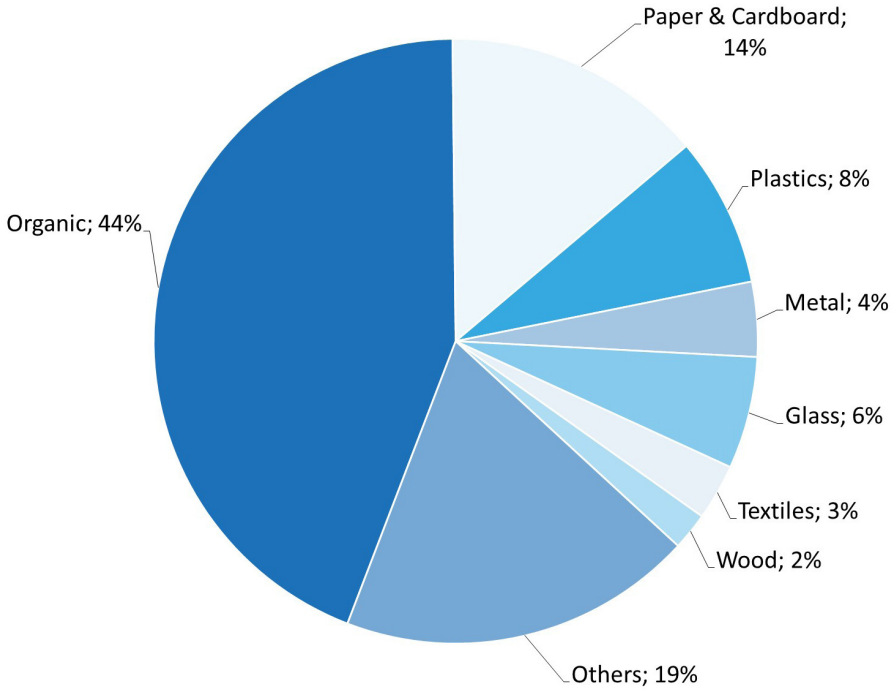

Figure 16: Classification of solid waste generated from tourism facilities in Hurghada (Source: WMRA, 2018) [5]

[6] Egypt State of the Environment Report 2016

Number and capacity of waste sorting centres

The solid waste recycling plant in Hurghada, which is the first of its kind in the Red Sea Governorate was implemented by the Environmental Preservation Association. The plant is equipped with German and Dutch equipment and technology. The plant capacity is 400 tons per day and the investment cost of the project exceeds 60 million pounds. The recycling process goes through five stages, starting with waste weighing, then it goes through filtering room to separate organic products, plastic, metal, and paper. After the filtering each fraction is condensed, wrapped, and shipped to reproducing factories within Egypt.

The technology, which was adopted in the construction of the factory, allows the introduction of future development elements on the production lines, allowing to improve the economic return of the operation process, as the factory's plan includes the launch of an attachment for the processing and production of alternative fuels (RDF), and it is also intended to launch an additional production unit to process the quantities of organic waste and leftovers from the tourism sector.

Number and capacity of recyclers for Non-Organic Waste

Table 10: Amount of Non-Organic waste per month

Type	Kg
Paper & Cardboard	95,000
Plastics	78,377
Plastics Bags	58,238
Metal	5,136
Glass	110,000

Waste management facilities in Red Sea

Table 11: Waste management facilities in Red Sea area (Source: Landbell, 2021)

Transfer station	Waste handling Facility	Dump/disposal sites	Landfills
0	1	7	0

Dump/Disposal Sites

Final disposal sites are mostly dump sites. Some dump sites are controlled with equipment for levelling and burial of waste, but most are just vacant land, where waste is unloaded and open burned. Almost every village council and many city councils in the governorate has its own dumpsite. List of unplanned dumps (open dumps sites) in Red Sea governorate:

a. Dump site in Hurghada

b. Dump site in Marsa Alam
c. Mold in the city of Safaga
d. Dump site in Ras Gharib
e. Dump site in Quseir
f. Dump site in Shalatin
g. Dump site in Halayeb

Number of cement kilns and other non-recycling facilities currently processing plastics

Refuse Derived Fuel (RDF)

Regarding the future outlook for refuse derived fuel (RDF). Figures show that the production of 1.5 million tons of RDF requires more than 7 million tons of municipal solid waste. Operational experience of using alternative fuels for the cement production in Egypt is still limited. However, the majority of Egyptian cement companies are subsidiaries to international companies which have a worldwide experience. Therefore, knowledge transfer should not be a major problem.

There are two different approaches for alternative fuel procurement:

First, a procurement approach which involves the purchase of alternative fuels that are readily collected and prepared by others, so that the cement company does not get involved in the processing of fuels themselves. While the second procurement approach involves the collection and preparation of the alternative fuels by the cement company itself to control its own supply.

List of cement companies that use Refuse Derived Fuel (RDF)

1. Suez Cement (Kilo 70 - Ain Sokhna - Suez)
2. Lafarge (KM 93 - Ain Sokhna Road)
3. El Amreya Cement (Kilo 32 - Marsa Matrouh Road - El Max - Alexandria)
4. Assiut Cement (Hamra Center - Assiut)
5. Beni Suef Cement (Bayad Al Arab east of the Nile Beni Suef)
6. ASIC Minya (Sheikh Fadl Road - Bani Mazar - Minya)
7. Misr Cement Qena (Kilo 8 - Qusair - Qena Road)
8. Alexandria Cement (1 th, El Max, El-Dekheila Department, Alexandria)
9. Katameya Cement (Kilo 30 Katameya - Maadi Road - Ain Sokhna - Cairo)
10. Helwan Cement (Kafr El-Alou - Helwan - Cairo)
11. El Sewedy Cement (Ain Sukhna - Suez Road)
12. Nile Valley Cement (Industrial Zone - Wadi Al-Ebiari / Al-Asheeb - East Beni Suef)
13. Arabian Cement (Kilo 97 - Ain Sokhna Road - Suez)

The following cement factories have indicated their willingness to proceed with alternative fuel projects:

Lafarge Egypt

The Lafarge Egypt Cement Factory is currently using 23,000 t/y of hazardous waste on its kiln number 4. The hazardous waste they are using is mainly composed of waste generated from the local petroleum and pharmaceutical industries. This utilization of waste has been welcomed by the EEAA and they expect more

quantities of this stream disposed in the same manner. Lafarge has also invested in using solid shredded waste (RDF) for its kiln number 2 fuel plant to utilize 72,000 t/y. The RDF is mainly composed of rejects from the waste sorting plants. The firm has also indicated that it is planning a further phase for an alternative fuel project which will utilize 120,000 t/y of rice straw for its kiln number 1.

CEMEX Assiut

The CEMEX factory has registered a CDM project which utilizes two sources of biomass residues. The 1st with capacity of 56,400 t/y of trimmings from a dedicated Casuarina trees plantation developed solely for biomass production. The other with capacity of 333,000 tons of agricultural waste, mainly rice straw, rice husk, cotton stalks, sugar cane and maize residues. They have also proposed the utilization of 60,000 t/y of other alternative fuels such as tires, used oils and lubricants, industrial sludge and RDF. CEMEX has indicated some difficulties in early stages of operations which was likely due to blockage in pneumatic conveyors which cause interruptions in flow of fuel which in turn cause disturbance in process.

Suez Cement

In 2016, the Suez Cement Company planned to spend US$77m to convert its Helwan and Torah cement plants to use coal and RDF. The Kattameya and Suez cement plants were already converted in the year 2015. The Kattameya cement plant is estimated to be utilizing 25,000 t/y of agricultural residues and 25,000 t/y of RDF. For the Helwan factory, it is estimated that 40,000 t/y of agricultural waste, 20,000 t/y of RDF and 10,000 t/y of sludge will be utilized. Subsequently, the plants would use 70% coal for their energy. The Helwan Cement will supplement this with 20-25% RDF and 5% natural gas. The Torah Cement factory will use 30% heavy fuel oil.

Arabian Cement Company

The Arabian Cement Company operates in two production lines with a total capacity of 4.2 million ton of clinker per year. In 2018, a new line for alternative fuel utilization is planned, to be financed by the Egyptian Pollution Abatement Programme (EPAP) III and other donors e.g. the European Investment Bank (EIB), the KfW (Kreditanstalt für Wiederaufbau), the Government of Finland and Japan.

The new line will use a hot disc combustion device to allow it to use high levels of alternative fuels from municipal waste. The newline would switch fuel mix into 70% coal and 30% alternative fuels, using a target mixture of 40,00 t/y of agricultural wastes, 20,000 t/y of municipal sludge and 82,000 t/y of RDF.

Packaging waste generation

The Egyptian legislation does not include a directive similar to the European Commission (EC) directive on packaging and packaging waste. Comprehensive legislation, which avoids the duplication of responsibilities, fills in the gaps of important regulatory functions, and enforcement is required for sustainable development of the solid waste management system in general and packaging waste management in particular. The institutional framework lacks: the necessary administrative capacities to manage, follow up and monitor the packaging waste management, and coordination between the main actors; and involves overlapping of duties.

According to the State of the Environment in Egypt report 2016, the estimated composition of municipal solid waste, in 2012, includes 13% plastics, 10% paper/cardboard, 4% glass and 2% metals. This means that about 29% of the municipal solid waste could be partly packaging waste. This percentage corresponds to about 6 million tons of the municipal solid waste stream. If a separation at source program would be implemented, packaging waste could be a substantial source of recyclable materials and revenue generation. At present, packaging waste is collected with the mixed municipal solid waste. The public sector generally provides municipal solid waste management services in most of the Egyptian Governorates. The role of the formal private sector is limited. In Egypt, there is large informal sector of traditional waste collectors (zabaleen or

Scavengers), waste pickers and recyclers. The waste pickers carry out source separation of municipal solid waste and collect the dry recyclables such as plastics, paper, glass, metals and textile. They perform their sorting work on the dumped waste in the streets, collection bins, collection points, transfer stations and dumpsites. Since their livelihoods depend on it, they achieve high recovery rates (up to 80%) which can be further processed in accordance with new demands and technological advancements in the recycling industries.

Non-governmental organization active in environmental issues and educational matters

A quick search, communication, and review of NGOs was carried out in the Red Sea Governorate, and information on their activities, contact information, website, number of members and funding sources was collected, and this is a list of the most active NGOs:

Table 12: Active NGOs in the region (Source: Landbell, 2021)

NGOs	Contact information	N°. of members	Funding sources
Environmental Protection Association in the Red Sea (HEPCA)	065-3445035 B2, New Marina, Al Sakkala P.O. Box 144 Hurghada, Red Sea, Egypt https://www.hepca.org/ info@hepca.or	110	International funding bodies / donations / revenues of the activities of the association (From financial resources for maintenance and installation of all berths / buoys)
Marine Rescue and Environmental Protection Association	Airport Road - Mubarak 2 - Hurghada - Red Sea 0653404022 01113132156 reps@reps-egypt.com http://www.reps-egypt.com/about/	65 Chairman: Hassan Foad El Tayeb	International funding bodies / donations / revenues of the activities of the association
Tourism Investment Association of the Red Sea	Golden Road, branched from the road to victory Downtown - Hurghada Phone: 0653550528 Fax: 0653550948	34	Donations / revenues of the activities of the association
Crescent Society Red Sea branch	L Nasr road 0653546522	137	International funding bodies / donations / revenues of the activities of the association (From financial resources for maintenance and installation of all berths / buoys)

HEPCA is considered the most active civil society organization in the field of the environment in general and the marine environment in particular since it has a major role in the solid waste management system in the governorate. HEPCA is involved in a large number of environmental awareness raising activities targeted at the local community, schools, tourism industry, and service providers. In August 2009, a protocol was signed between the Red Sea Governorate and HEPCA; this protocol consigned the responsibility of Solid Waste Management in the Marsa Alam to HEPCA; giving HEPCA exclusive responsibility over waste collection, recycling, and disposal. The Hurghada recycling facility opened on 25 January 2019 is managed by HEPCA.

5.3.3 South Sinai Governorate

The South Sinai Governorate is considered a global centre for tourism of all kinds, as it is characterized by all climatic, natural, land and marine components, which are valid for all types of tourism, foremost among which beach tourism, diving tourism and water sports on the Gulf of Aqaba, then medical tourism and herbal remedies are also available in the governorate. And the importance of the cities of South Sinai is increasing in conference tourism, especially in Sharm El Sheikh, which hosts many international conferences. The most important tourist areas are concentrated in the golden triangle (Sharm El Sheikh - Nuweiba - Dahab).

South Sinai is one of the governorates that possesses many natural resources. Its capital is the city of El-Tor. South Sinai Governorate includes 9 cities, 12 local village units, and 146 Bedouin communities

Table 13: South Sinai demography (Source: Landbell, 2021)

Governorate	Area (km^2)	Population 2019	Capital	Number of cities
South Sinai	31,272	170,987	ToR	9

Table 14: Touristic clusters in South Sinai (Source: Landbell, 2021)

Cluster	Area (km^2)	Population	Number of hotels	Number of green star hotels
Sharm El Sheikh	480	77,000	196	14
Dahab	1130	5,000	33	1
Taba	3.72	3,000	24	6
Nuweiba	5097	17,000	12	0
Saint Catherine	5130	6,640	12	0
Ras Sidr	6750	2,100	20	0

Table 15: Classification of hotels in South Sinai (Source: Landbell, 2021)

Cluster	5 stars	4 stars	3 stars	2 stars	1 star	Under classification
Sharm El Sheikh	43	65	52	23	3	10
Dahab	2	8	4	9	7	3
Taba	8	7	6	0	0	3
Nuweiba	4	2	6	0	0	0
Saint Catherine	0	1	4	0	0	7
Ras Sidr	1	5	4	2	2	6
Total	**58**	**88**	**76**	**34**	**12**	**29**

Table 16: Distribution of green hotels to tourist cities in South Sinai (Source: Landbell, 2021)

Cluster	Green star Hotels	
	N°.	% of the total governorate
Sharm El Sheikh	14	67 %
Dahab	1	4 %
Taba	6	29 %
Total	**21**	**100%**

Background on the tourist cities in South Sinai

Sharm El Sheikh is an Egyptian tourist city located at the crossroads of the Gulf of Aqaba and Suez on the Red Sea coast specifically, with an area of approximately 480 km2. Sharm El-Sheikh city is the most populated centre and represents 53.4% of the total population of the governorate, where it is concentrated about 61% of the total population of urban governorate. It is the largest city in the South Sinai Governorate, and includes a group of tourist resorts that visitors from all over the world visit, and more What distinguishes it is that it contains one of the international diving centres that attract diving enthusiasts from all over the world, and it also contains an international airport.

Dahab has a population of 5000 people, Dahab has an area of more than 1130 km2, it is located in the Arab Republic of Egypt (in the Asian part) in the South Sinai governorate, and is located on the Gulf of Aqaba, 100 km from the wonderful city of Sharm el-Sheikh and 87 km from the Egyptian city of Nuweiba. It is a tourist city in the first place and is divided into two villages in the north of the city, which is the most famous after the city of Sharm El Sheikh, and it has the most famous diving areas.

Taba is located at the head of the Gulf of Aqaba between the mountain range and the eastern Taba plateaux on the one hand, and the waters of the Gulf of Aqaba on the other. The city has a population of 3000 people, an area of approximately 3.72 km2, and is 240 km north of Sharm El-Sheikh. The city represents a great historical and strategic value for its distinguished location that supervises the borders of 4 countries: Egypt, Saudi Arabia, Jordan, Palestine.

Solid waste management in South Sinai

City councils and local units are responsible for collecting garbage by removing garbage and waste from the main and subsidiary streets and transporting them to the public dump of each city. The governorate depends on 1 civil society and 3 companies, 2 civil society associations, which is a protection society for community development, and 3 companies: Zahra Sinai Company. Taba Contracting Office (Cleaning Company) Chaumeng Sharm Nabq Company "A private society in the collection and transportation of solid waste, whereby companies and NGOs collect the waste directly from residential and commercial units and industrial facilities in the areas assigned to them and transfer them to the public landfills of each city and The Health Affairs Directorate collects medical waste at the governorate level.

Table 17: Solid waste generated at a city level in South Sinai (Source: WMRA, 2018) [11]

City	Waste generated per day (tons)
Sharm El Sheikh	100
Dahab	9
Taba	5.7
Nuweiba	8.3
Saint Catherine	6.7
Ras Sidr	13.9
Abuznimah	4.6
Abu Rudeis	6.2
El Tor	36.9
Total	**191.3**

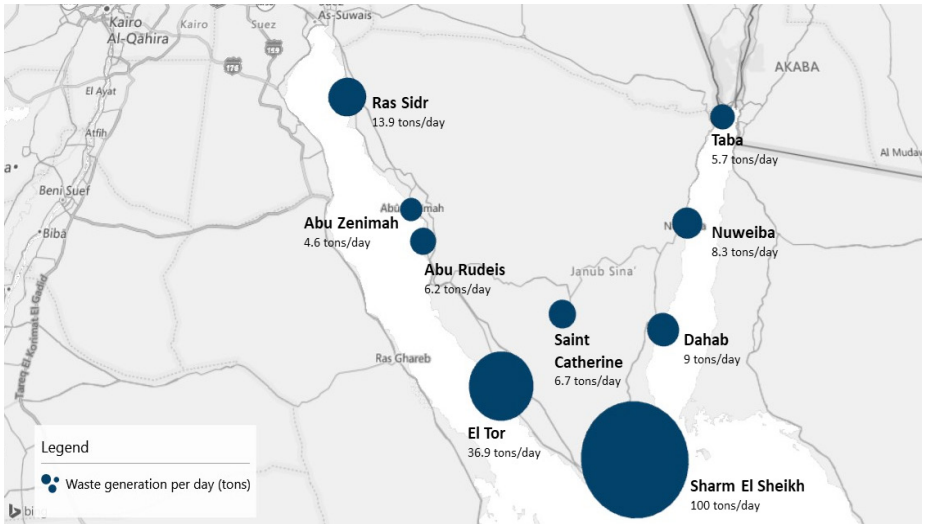

Figure 17: Solid waste generation at a city level in South Sinai (Source: WMRA, 2018) [5]

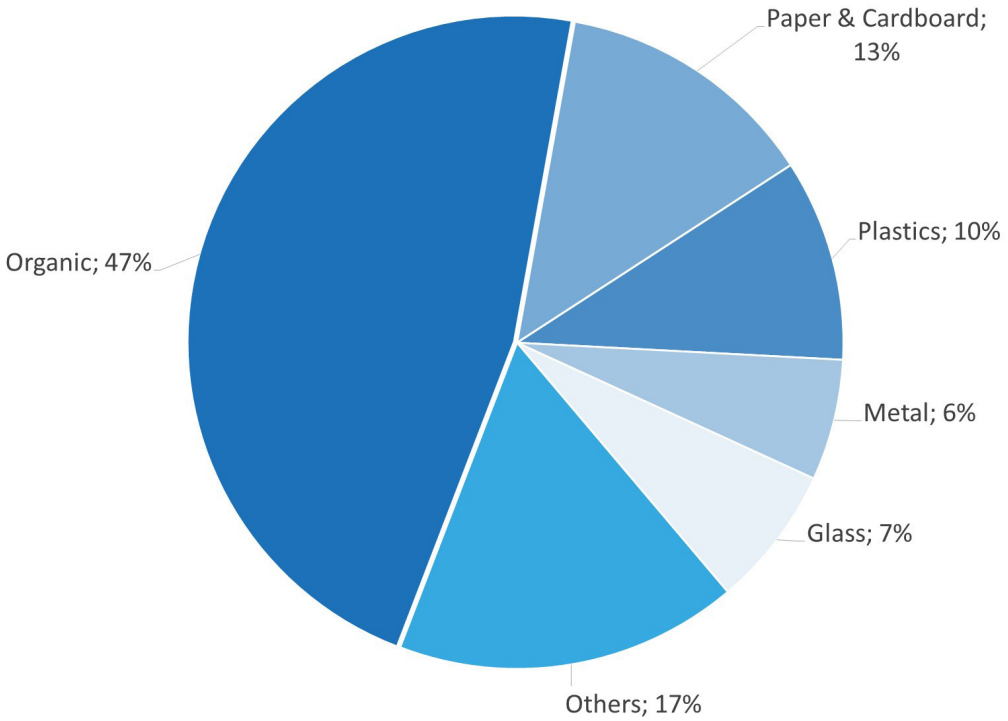

Figure 18: Classification of solid waste generated Inside Recycling factory in Sharm El Sheikh (Source: WMRA, 2018) [5]

Number and capacity of waste sorting centres

There is a waste recycling plant established in 2006 but it has been out of business since 2011. In 2019 the governorate has contracted with a private company to operate and raise the efficiency of the organic fertilizer sorting and recycling plant in Sharm El Sheikh, qualifying it to receive the waste and sort the recyclable materials and convert the organic waste into an organic fertilizer, and operate a landfill Waste from non-recyclable treatment products. There are 6 intermediate stations in the governorate, and there are sorting operations, but some of them are not working and some of them are found inside public landfills.

1. Transfer station at Ras Sidr
2. Sinai Transfer Station
3. Dahab Transfer Station
4. A training center affiliated with the Environmental Protection Association, Nuweiba
5. Nuweiba Transfer Station
6. Saint Catherine Transfer Station

Table 18: Waste management facilities in South Sinai (Source: Landbell, 2021)

Transfer station	Waste handling Facility	Dump/disposal sites	Landfills
6	1	9	0

Dump/Disposal Sites

Final disposal sites are often open dump sites and adjustments are made from time to time, and do not reach the parameters of a controlled dump. Some dump sites are controlled with equipment for levelling and burial of waste but most are just vacant land, where waste is unloaded and open burned. Almost every village council and many city councils in the governorate has its own dumpsite.

1. Dahab mold (Lessor to the Society for the Protection of Community Development);
2. Taba (rented to Taba Contracting Company);
3. Sharm El-Sheikh (rented to Zahra Sinai Company);
4. Nuweiba (rented to the Society for the Protection of Community Development);
5. El Tor city Park (rented to a private company);
6. Abou Radies City;
7. Saint Catherine;
8. Ras Sudr;
9. Abu Zenimah.

Non-governmental organization active in environmental issues and educational matters

A quick search, communication, and review of NGOs was carried out in the South Sinia Governorate, and information on their activities.

Table 19: NGOs in South Sinia (Source: Landbell, 2021)

NGOs	Contact information	N°. of members	Funding sources
"Hemaya" Association for Community Development (Community Development, Environmental Awareness, and Sustainable Development)	Nuweiba, South Sinai	51-200 employees	Donations / revenues of some activities
Nuweiba Investors Association - Taba - Nuweiba Environmental development (environmental protection) / tourism development / local community development / cultural and scientific services	Ahmed Saeed Mustafa Kamel (President) 0123911394 0106442697	9	Donations / revenues of some activities
Sharm El Sheikh Investors Association	Housing Riviera Real Estate No. 2122 Villa 2, Second Floor Mohamed Abdel-Fattah Khalifa - President 069/3661696	15	Donations / revenues of some activities
ECO- DAHAB	Call +48 880 498 843 m.me/EcoDahab kasiatravel@gmail.com http://www.facebook.com/EcoDahab Nadine Abd elwahab +201095070121	25	International funding bodies / donations / revenues of the activities of the association

5.3.4 Pilot location – conclusion

Considering the presence of an operating waste sorting facility in Hurghada, whereas there is no recycling facility in operation in the South Sinai governorate nowadays, the recommendation is to run the pilot in the Red Sea governorate. The town of Hurghada is the closest to the recycling facility. With a population of ca. 200,000 inhabitants and 28 Green Star hotels (out of a total of 161 hotels), it offers a suitable environment for conducting the pilot. Alternatively, smaller cities could be considered, like Safaga or Marsa Alam, which boast respectively 13 and 11 Green Star hotels. However, these towns are located 64 and 285 km from the recycling facility, which would entail logistics costs. Located between these two towns, Qsier does not have any Green Star hotel. Overall, Hurghada is likely the more suitable location.

Further consultation with EHA, local authorities and local NGO, especially HEPCA, should confirm or inform this opinion.

Meeting with HEPCA in Hurghada

A virtual meeting with HEPCA was followed by an onsite meeting of NSWMP and HECPA in Hurghada on December 15, 2020. Since securing their first solid waste management contract in Hurghada back in 2011, HEPCA has grown into a full fledge waste management company, while retaining its original purpose. The initial contract with the city of Hurghada was renewed in 2017 and remains into for until 2024. HEPCA now employs over 400 staff dedicated to waste management and runs a fleet of 68 trucks, including 22 compactor trucks. The sorting facility is able to process 400t of waste per day.

Table 20: Waste Management capacity of HEPCA in Hurghada (Source: Landbell, 2021)

Description		Number
Equipment	Loader 3 m^3	2
	Loader 1m^3	2
	Sweeping truck	6
	Hook lift truck 12 tons	2
	Tipper Truck 2 m^3	10
	Tipper Truck 6 m^3	3
	Tipper Truck 3 m^3	3
	Tipper Truck 20 m^3	2
	Compactor truck	22
	Closed box truck	8
	water tanker	1
	private car for managers	7
Total Equipment		**68**

Description		Number
Bins	1.1 m^3 bin	1511
	10 m^3 bin	13
	240 litter bin	460
Total Bins		**1984**
Workers	Managers	22
	Engineers	1
	Technicians	25
	Supervisors	24
	Security	4
	Sweepers	250
	Monitors	54
	Drivers	62
Total workers		**442**

Waste Sorting Process

Through a field visit conducted to the waste recycling plant and the landfill and an interview with the plant manager, the following information were provided.

The plant has capacity around 400 tons/day and has been equipped with German technology (EUREC) and Dutch technology (Bollegraaf), to decrease the percentage of waste to be landfilled. The installed technology is also scalable to add recycling processes and handling of unconventional waste. For instance, HEPCA is considering for the future, the recycling of organic waste, the production of garbage bags and the recycling of 7,000t of PET in the future.

The production line starts with receiving the waste coming from the residential and tourism sector in Hurghada city, which is weighed on arrival using a digital scale (100 tons). The weight data is registered on computer. The trucks are unloaded in the reception area in parallel lines to allow for waste ventilation and decrease the amount of humidity. The waste is then loaded to feed the sacs opening machine (German EUREC, capacity 40 tons/hr) and transferred to the conveyor belt to start the first stages of metal waste sorting. This stage is followed by organic waste segregation through a multi speed filter. The speed is regulated according to the density of organic materials in the received waste. The amount of organic material reaches 40% of the total amount of the waste received, it can be used in the manufacturing of organic fertilizers.

After removal of organic waste, the remaining is conveyed to the air sorting stage. This is done by passing the waste on an (inclined/ramped pedal) in front of air pumps which split the flow into two parallel lines. On the first line, light weight, low density waste passes and is called (2D). Along this line are 18 sorting stations (points) where workers separate valuable materials. The most important among these materials are cardboard and plastic bags. The remaining valueless waste, amounting to 25% of the total amount of waste

received, passes on the reject line to the rejected materials room (2D) then it is supplied to cement factories (RDF). The heavy weight, high density waste called (3D) is sent to the second line. Along this line are 18 sorting stations (points) as well. These materials include cans, PET bottles, plastic, tetra pack, etc.).

The process ends up with the remaining valueless waste (representing 15% of the total amount of received waste) going to the rejects room (3D). These rejects are useless and are transferred to the landfill. It is worth mentioning that the technology approved in establishing the plant allows for introducing future upgrading of the production lines to improve the economic revenue of the operation process. It targets establishing an extension for processing and producing RDF and another unit for producing fodder to benefit from organic waste and food leftovers generates in the tourism sector. In addition, preparations are ongoing to increase the value of the sorted flows, by introducing additional equipment to crush, granulate and wash plastics and PET.

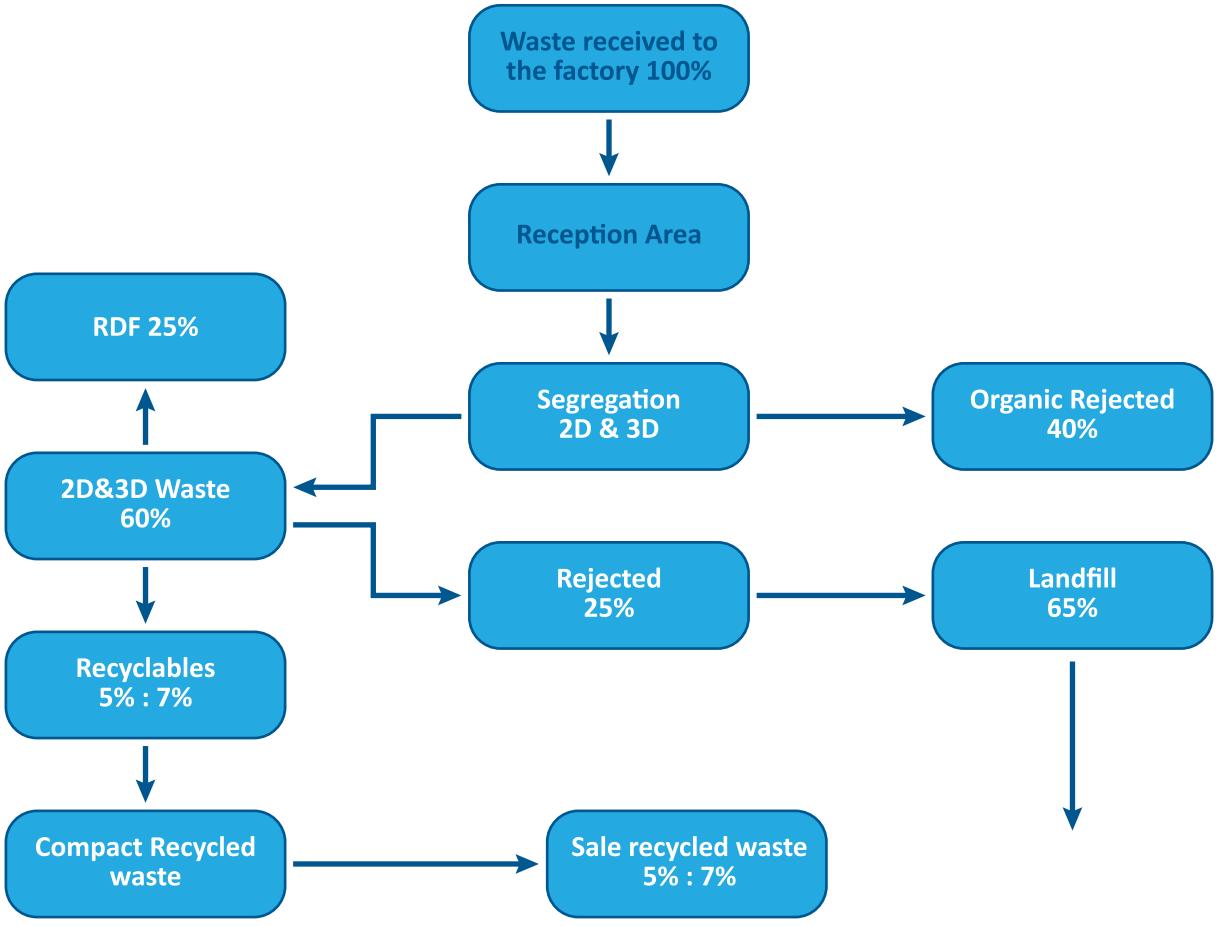

Figure 19: Waste sorting plant in Hurghada (Source: HEPCA, 2021)

Table 21: Classification of the quantities of waste from the tourism sector (Hotels) (Source: HEPCA, 2021)

Classification of the quantities of waste from the tourism sector (Hotels)		
Item	**Percentage**	**Average market price (L.E)**
Humidity	10%	0
PET	3%	4,500
Aluminium cans	0.20%	9,000
RDF	25%	0
Plastic	1%	4,000
3D waste rejected	10%	0
Plastic Bags	3%	1,000
Others	0.30%	500
Organic waste rejected	28%	0
Cardboard	3%	1,600
Organic waste (Feed)	16%	600
Iron and tinplate	0.50%	3,500

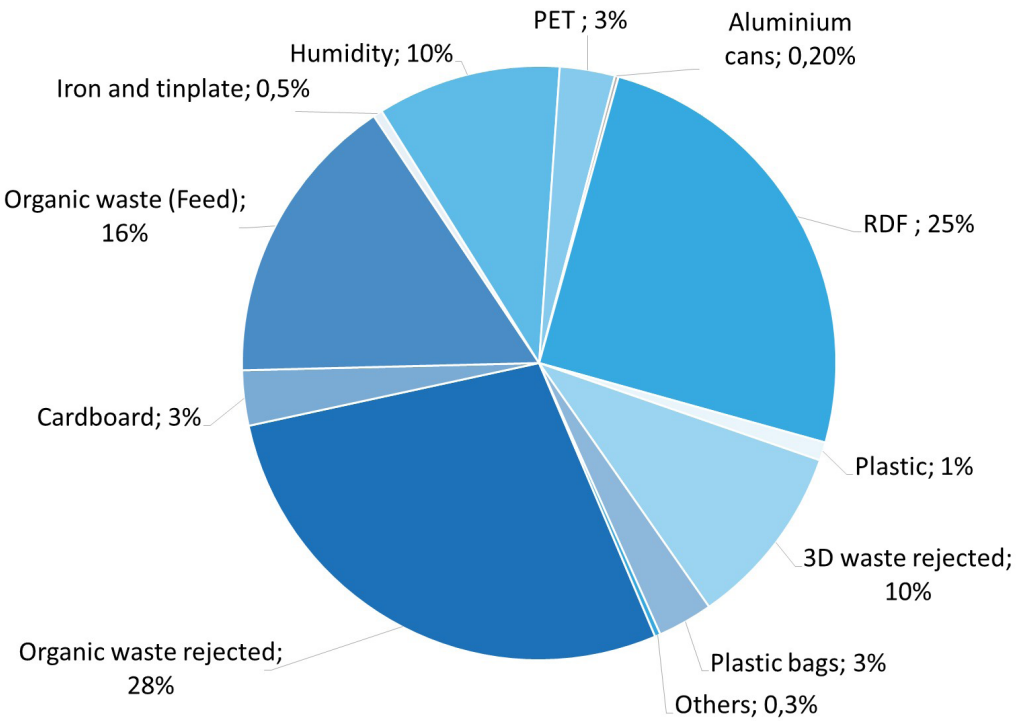

Figure 20: Classification of the quantities of waste from the tourism sector (Hotels) (Source: HEPCA, 2021)

Impact of the informal sector on HEPCA activity plant

HEPCA's solid waste collection system in Hurghada is affected by informal picker scavenging. The informal sector cherry picks around 30% of the waste generated in Hurghada and sell it to 5 Cairo-based waste traders. This generates a net loss for HEPCA.

Going forward with the Pilot

HEPCA expressed their willingness to cooperate in the EPR pilot which they expect will provide them actual and practical support. Among the potential positive impact that the project could contribute to HEPCA, they have mentioned ideas such as:

- Expanding their fleet and collection capacity;
- Improving their separation processes;
- Establishing a recycling facility;
- Compensating the informal sector to secure the collected material;
- Incentivising the households to get the plastic waste directly from the local communities;
- Rolling out awareness campaigns.

It was agreed that GIZ and HEPCA would stay in touch and meet again to further discuss the project in more details, while GIZ would coordinate with public stakeholders.

Figure 21: HEPCA waste management facility (Source: Landbell, 2021)

6. Amendment of the regulatory framework

While a pilot can be developed and provide exploitable results without a constraining regulatory framework, it is essential that the issuance of clear regulatory guidance should precede national deployment of a packaging EPR scheme. This is a condition for success.

There is a clear demand from the producers to benefit from such a clear regulatory framework, which will set targets, incentives and penalties. Thus, it will create a level playing field and dissuade profiteering and free riding.

Currently, there is no legislation in place to support the implementation of EPR. Moreover, it appears that the current regulations might even create hurdles for recycling, either by limiting the waste feedstock or by restriction the applications of recycled materials.

Therefore, it is advisable to create a dedicated EPR regulatory framework, with a view to set the objectives, define the EPR concepts under Egyptian law, clarify the obligations of the respective stakeholders, quantify the targets, define the implementation modalities and solve possible contradictions in the current legal corpus.

This could translate, for instance, in an EPR law, supplemented by supporting executive decrees focusing each on a relevant part of the legislation. For instance:

- Registry;
- PRO licensing;
- Waste collection (including the role of the informal sector);
- Waste sorting and treatment;
- Use of recycled materials;
- Penalties.

The following elements should be addressed in the legislation:

- Terms and definitions
    - It is important that align understanding of all stakeholders and to introduce new concepts in a clear manner;
    - For instance: definition of EPR, producer, primary packaging, secondary packaging, tertiary packaging, sorting, recycling (and accepted processes), recovery, energy recovery, disposal, recycled material, waste generator categories (households, commercial, industrial), PRO, registry, etc.;
    - As an example, a producer can be defined as whichever company places on the market for the first time a product contained in some kind of packaging; that would include a manufacturer in Egypt, an importer of such product, a retailer selling the product under his own name, or a distant seller (via online sales), but would not include the manufacturer of the packaging itself. The clarity of the definition will help setting clear responsibilities.

- Objectives of the legislation
    - For instance: avoid landfill, promote recycling, improve working conditions of the informal sector, incentivize the development of more sustainable packaging, provide sustainable financing of waste collection and treatment.
- Obligated parties and their relative obligations and in particular those of
    - Producers and importers;
        - Obligations may include financing the system in proportion of their market share, marking their products, developing consumer awareness of the need to avoid landfill and source-separate waste, participate in a PRO, etc.
    - Retailers;
        - Even if retailers do not act in a producer capacity, they may have specifc obligations like packaging waste take back, or verifying that their suppliers are properly registered prior to placing an order.
    - Waste collectors, sorters and recyclers;
        - Obligations may include the need to be licensed, to achieve certain technical and quality standards.
        - Specific expectations related to the informal sector.
    - PRO;
        - Obligations may include developing and managing the collection, sorting and treatment of waste by involving formal and informal businesses in order to achieve the quantitative targets set by the regulations, developing and running awareness programs, developing and running R&D programs.
    - Registry;
        - Obligation may include the collection in a secure manner of sales data from the obligated producers, collection, sorting and treatment data from the waste operators or the PRO, providing public access to the name of registered entities to dissuade free riding.
    - Local authorities;
        - Obligations may include handing over the packaging waste where they are in charge of waste collection, or facilitating the operations of the PRO in terms of collection and awareness.
    - EEAA and WMRA and other government bodies;
        - Obligations may include licensing of PRO and waste operators, regulatory enforcement, application of penalties where applicable.
- Collection targets by material
    - Plastics, paper and cardboard, multi-layered materials, glass, metal packaging;
    - Applicable ramp-up over time (increasing targets) or applicable grace period to achieve the targets.
- Sorting, recycling and recovery targets by material
    - Plastics, paper and cardboard, multi-layered materials, glass, metal packaging;
    - Applicable ramp-up over time (increasing targets) or applicable grace period to achieve the targets.

- PRO
    - Licensing (if applicable): via license application or public tender;
    - Legal and fiscal set-up (whether single PRO or competing PROs, for profit or non-profit, type of legal entities, tax regime applicable to services and surpluses;
    - Internal governance and external control.
- Incentives for
    - Reducing packaging use;
    - Reducing non-recyclable packaging;
    - Using recycled materials.

7. Packaging EPR implementation practices

7.1 Germany Packaging

The German Packaging Act

It is difficult to mention packaging EPR without referring to its implementation in Germany. Germany was the first country to ever pass a legislation on packaging ERP and it has modelled the subsequent European regulations. Implemented in 1991, the German system has been in place for nearly 30 years and it was updated in 2019 via the new packaging act, to reflect experience acquired. Though the model is not transposable as such to Egypt, it is worth highlighting its key characteristics.

The German packaging regulations were first implemented as a mandatory EPR system. It created a take-back obligation for producers on various types of packaging:

- Transport packaging;
- Repackaging material, used for grouping of products;
- Sales packaging.

Initial targets, presented in the table below, were subsequently increased.

Table 22: Initial Targets in the German Packaging Ordinance 1993 (Source: Prevent Waste Alliance – EPR Toolbox, 2021)

Packaging Material	Collection Target	Sorting/Recycling Target	Recycling Quota
Glass	60%	70%	42%
Tinplate	40%	65%	26%
Aluminium	30%	60%	18%
Paper and Carton	30%	60%	18%
Plastics	30%	30%	9%
Composite Materials	20%	30%	6%

The recycling quota is the sorting/recycling target is in correspondence to the collection target.

In order to fulfil the obligations of the producers and retailers, a PRO was established, the Duales System Deutschland, or DSD. The fees paid by producers, initially established per package according to its size

(regardless of the material), soon evolved into a fee per kilo of the specific material, glass being the cheapest and plastics the most expensive.

Additionally, to ensure that the packaging collected and sorted would eventually be recycled, specific organisations were identified (and in some cases created) as guarantor. They committed to take over the sorted waste fractions and recycle them at no extra cost. There was one entity for plastic packaging, one for beverage cartons, one for aluminium packaging and one for glass packaging, while ferrous metal packaging was sent to steelworks. While they contributed to the ramp up of a recycling industry in the early stage, the role of these entities was drastically reduced and replaced by a more competitive environment at the urge of the German Competition Authority.

During the first 10 years of the scheme, collection performance increased, and rules were adjusted from time to time to address specific issues. For instance, collection target was replaced in 1998 by a recovery quota, calculated over the quantities introduced in the market by participating producers:

Table 23: Recovery quota in German Packaging Ordinance 1998 (Source: Prevent Waste Alliance – EPR Toolbox, 2021)

Packaging Material	Recovery Quota
Glass	75%
Tinplate	70%
Aluminium	60%
Paper and Carton	70%
Plastics	60%

Additional requirement on plastics imposed that at 60% of the recovery would be performed as material recycling.

In addition, to reduce free riding, producers opting for an individual system instead of joining the PRO were asked to have their individual recovery quota verified.

A deposit system was also introduced in 2003, for one-way beverages. The same year saw also the end of the DSD monopoly in favour of competition among multiple PRO, as requested by the German Competition Authority. This led to a significant decrease in costs with no negative side effect on recovery and recycling.

In 2019, a new law was enforced with yet new requirements aiming at achieving more ambitious results while fixing some of the issues of the former system, particularly in relation to free riders.

Free riders are company who envoy the markets opportunity without fulfilling their regulatory obligations in relation to EPR or lessening their obligations by under-declaring their volume placed on the market.

The new German Packaging Act pursues 3 goals:

- Clear increase of recycling targets;
- Prevention of packaging waste;
- Fairness between market participants.

Recycling target have been adjusted as follows:

Table 24: Adjusted recycling targets in the German Packaging Act (Source: Landbell, 2021)

Material	VerpackV*	VerpackG 2019*	Verpack 2022*	Proposed EU Target by 2025
Glass	75%	80%	90%	70%
Paper, Cardboard, Paperboard	70%	85%	90%	75%
Ferrous metals	70%	80%	90%	70%
Aluminum	60%	80%	90%	50%
Beverages boxes	60%	75%	80%	-
Other composite Packaging	60%	55%	70%	-
Plastics	36%	59%	63%	50%

Obliged companies are, producers and all other economic operators who **first market packaged products** (initial distributor) in Germany have to comply with the new law – even if based abroad if they put packaged goods into Germany.

Since it there is **no minimum limits**, everyone who commercially puts packaging into Germany for the first time is affected by the new Act and has to comply with regulations.

In case of **export to Germany**, the company - which is responsible for the packaged goods by crossing the German borders (transfer of risks) - has to comply with the German packaging obligations.

The incoterm used in sales contracts help to identify the company which has to fulfil the packaging obligations.

In case of **DDP sales** to German retailers, **the seller based abroad is responsible**.

In case of EXW sales (ex-works) to German retailers, the German company is responsible.

The obligation also covers **any distant seller (web shop)** that e. g. sells packaged goods from Poland to Germany.

Packaging subject to system participation are Packaging filled with goods that, after use, typically* remain at the private end consumer* as waste.

> ***Private** end consumers are private households and sources of waste generation equivalent to these e.g. restaurants, hotels, canteens, administrative offices, hospitals etc. (further examples are listed in § 3 (11) VerpackG). Comparable places of origination also include small and medium-sized companies that dispose of their waste (paper, board,

cartons, glass and lightweight packages) using collection containers of a typical household size (1,100 l.).

***Typically** means that if "the vast majority of packaging ends up with the private final consumer, this packaging has to participate in total in a system, even if individual packaging finally may end up as waste with other final consumers".

Packaging in Scope

Sales Packaging is used to protect goods and products and ensure their safe handover to the consumer. The term sales packaging describes packaging that are offered as a consumer sales unit and are sold to private end consumers.

Service Packaging is used at the POS to hand over goods to consumers (e.g., a bread bag at the baker's, the paper wrapped around fresh meats at the butcher's, fruit or vegetables bags, coffee-to-go cups, pizza boxes).

Delivery Packaging (in case of catalogue/web sales) is used to deliver goods to consumers (e.g., the shipping cartons, fillers materials like bubble foil).

This does not include Transport packaging which is typically not for handing over to the private ultimate consumer, also for the "handling" of goods (storage at distributors/retailers), as well as Packaging of hazardous goods (as listed in the Act), and One-Way-Packaging of beverages covered by the one-way Deposit Refund System.

The Act also imposes a new marking obligation on beverage packaging, to provide an indication whether the beverage container is meant to be reused ("Mehrweg") or one-way ("Einweg"):

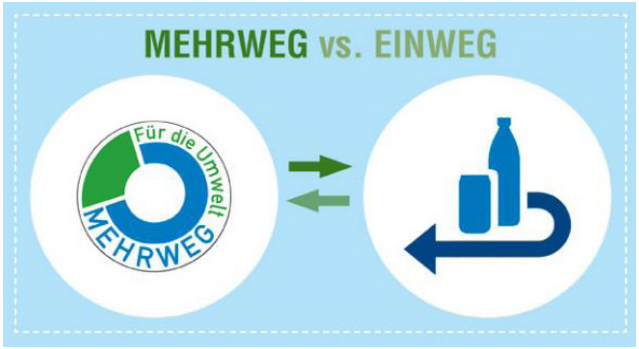

Figure 22: Marking obligations on beverage packaging (Source: Mehrweg.org and DPG Deutsche Pfandsystem GmbH, 2021)

Counteracting Free Riders

In order to reduce free-riding and ensure a level playing fields the new Act introduced additional requirements to producers:

1. To join a compliance scheme (PRO) and;
2. To register with the new packaging authority (Zentrale Stelle Verpackungsregister at https://www.verpackungsregister.org/) before dispatching any packaged goods on the German market and;

3. To report the amount and type of packaging materials they put into the German market to the Central Agency and to their PRO;
4. In specific cases to submit a Declaration of Completeness to the Central Agency.

LUCID, the register managed by the Zentralle Stelle, is a publicly accessible database. While the quantities reported by producers are confidential and not visible to the general public, it is possible for anyone to check if any given company is registered on the registry (https://oeffentlicheregister.verpackungsregister.org/).

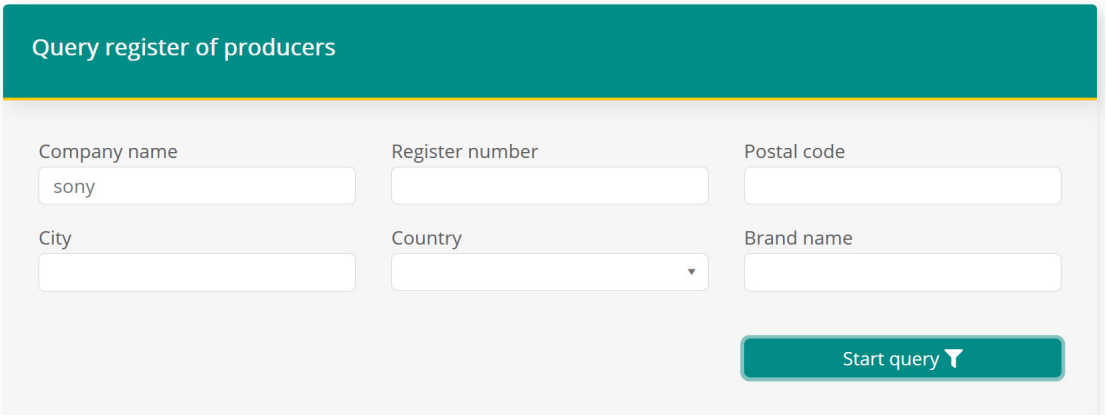

Figure 23: Query register of producers (Source: Stiftung Zentrale Stelle – Verpackungsregister, 2021)

This way, it is easy to spot a potential free rider. Among registered companies, arguably compliant, the obligation of declaring packaging weight to the registry in addition to the declaration to the PRO creates an opportunity for data reconciliation.

Declared data have to be formally verified by external experts – qualified by the Zentralle Stelle – for all producers over a certain threshold of packaging material placed on the market:

- Glass
  > 80 000 Kilos;
- Paper, board, Cardboard
  > 50 000 Kilos;
- LWP (plastic, composites, metal)
  > 30 000 Kilos.

The registration with the Central Agency and the participation in a compliance scheme are stipulated by law. Breaches can lead to market bans and trigger significant administrative fines.

Companies are not allowed to market products which packaging is not registered. The distribution ban affects both the manufacturer and each subsequent distributor.

In case of non-registration, or of distribution of goods where the manufacturer has not correctly registered the brands they are distributing, there is a potential fine of up to 100,000 EUR, while non-participation in a compliance scheme may be punished with a fine of up to 200,000 EUR. Failure to report packaging data to

the Zentrale Stelle will result in fines of up to 10,000 EUR and failure in the submission of the Declaration on completeness may result to fines of up to 100,000 EUR.

7.2 Chile Packaging

An inclusive approach of the informal sector

Further to joining OECD in 2010, Chile introduced a Waste Management, Extended Producer Responsibility and Recycling Incentives Bill in 2013. It was published in 2016 as Ley N° 20.920) and covering 6 different product categories:

- Tires;
- Packaging;
- Lubricant oils;
- E-waste;
- Automotive batteries;
- Portable batteries.

Producers of above products are bound by law to organise and finance the management of end of life products and have to fulfil in particular the following obligations:

- Register;
- Organise and finance, via a PRO, the collection, storage, transport and treatment of waste products;
- Ensure that waste management activities are fulfilled by duly authorised entities;
- Comply with additional product-specific goals.

Each product category's EPR goals and obligations are due to be subject to product-specific decrees, that further clarify the law.

In case of packaging, the draft decree defines the following:

- Materials in scope are beverage cartons, metal, paper and cardboard, plastic and glass;
- Targets per material and origin (consumer or industrial);
- Ramp-up plan over 8 years;
- Ability to fulfil obligations individually or via a PRO;
- Threshold under which there is no obligation for a producer to comply with the goals (though most still have to be registered);
- Concept of a territorial allocation in case of multiple PRO (as one municipality can only be served by one PRO);
- Growing kerbside collection coverage over time from 10% to 85% of the population;
- Annual, auditable PRO reports;
- PRO must integrate informal sector.

The overall target is to increase household packaging recycling from 12.5% currently to 60% in 2030 with the following materials targets:

Table 25: Targets for household packaging recycling in Chile (Source: Prevent Waste Alliance – EPR Toolbox, 2021)

Packaging recycling	Household target	Industrial target
Beverage cartons	60%	N/A
Metal	55%	70%
Paper and cardboard	70%	85%
Plastics	45%	55%
Glass	65%	N/A

A PRO willing to operate needs to submit a management plan including the financing mechanism. Reporting has to take place on a yearly basis and must include details about the fees composition and amounts. A financial guarantee also has to be provided.

Informal sector is a priority and PRO are mandated by law to rely on the informal pickers. PRO have to treat informal players preferentially, in their sourcing tendering process. In addition, the PRO must publish the processes and tools for training, financing, and formalisation of the informal sector. This indicates an intention to – probably gradually – integrate the informal waste pickers in the formal economy.

The Ministry of Environment also published a "Policy for the Inclusion of Waste Pickers", which aims at promoting the social, economic and environmental inclusion of the informal waste collectors.

A labour competency centre has been created to allow informal waste pickers to acquire knowledge and skills necessary to manage waste according to the current regulations and certification to operate their activity. Once they are certified and registered in the national EPR systems, they are allowed to contract and operate as waste manager. They are allowed to sign direct contracts with municipalities and PROs. The approach was to avoid social exclusion of a significant population, while also leveraging their proven waste collection capability.

The objectives pursued were threefold:

- Environmental: increasing the recovery of waste through the work of the waste pickers;
- Economic: strengthening the business capacities of waste pickers;
- Social: increasing human dignity through their recognition by society.

A multi-stakeholder approach, involving representatives for the public sector, private sector, education, certification and NGO created the basis for a formal 5-year programme.

As of 2019, out of an estimated 60,000 waste pickers, 5,000 had joined a waste picker organisation, 1,110 were registered in the system, 150 were certified and 350 in certification training (Valoryza, 2019).

This inclusion of the informal sector is somewhat facilitated by the existence of a national organisation of informal recyclers, the "Movimiento Nacional de Recicladores de Chile" (MNRCH AG), i.e. the National Movement of Chile Recyclers. This association, which counts 50 affiliates organisations in 8 regions of Chile, participates in the plan via a collaboration agreement.

In conclusion, the ERP regulations for waste packaging in Chile have factored in the role of the informal sector, offering a frameworks, goals and tools to favour the integration of the informal sector. It becomes possible to rely on an organized – albeit informally – collection infrastructure to progress towards the regulatory targets, while at the same time improving the welfare of a large community.

This intention contrasts with the case of Bulgaria, where e-waste regulations did not factor in the informal sector, which led to dire consequences.

A counter example: consequences of excluding the informal sector in Bulgaria

In 2004, a new EPR system for packaging waste was established in Bulgaria. About 10,000 informal waste pickers who were previously involved in the collection of packaging waste were not included in the new system, even though they had proven able to achieve rather significant recycling rates. They were depending on this activity for their livelihood. So, the new EPR system ended up competing for waste with the informal sector. A collection infrastructure has been deployed, consisting in curb side collection containers. While the households did not automatically switch to the new collection system, the waste ending up in the containers became an easily accessible source of material for the informal pickers. Ultimately the cost of operating the EPR system became extremely high in relation to the waste volume effectively collected. An estimated 90% volume continued to be channelled through the informal sector (ISWA/EXPRA/RDN, 2014).

7.3 Digitalization

Digitalization is a key support for the successful implementation of EPR.

Key processes under the scope of digitalization are:

Producer registry

Producer registry is a key enforcement and control tool. It promotes transparency and dissuades free riding by offering a possibly for the public or the peers (and competitors) to verify the registration of an obligated producer.

Producer registry key functions can include:

- Initial registration of a producer
    - Name, address, contact details, business registration number;

- Qualification (manufacturer, importer, distant seller, retailer);
- Possibly type of materials for which the registration takes place.

- Declarations
  - Put on market weight by material for each relevant compliance period;
  - 3rd party verification of declarations.

Registries may also include an operational part where waste managers or PRO will report operations-related data, like collection volume, treatment volume, recovery volume.

Such data management is best supported through robust and secure IT systems. Whereas the registration data is best made public, the declaration data is usually considered highly confidential and competitively sensitive by producers and should not be shared. However, it is an information needed by both the registry and PRO to calculate the respective obligations of each producer.

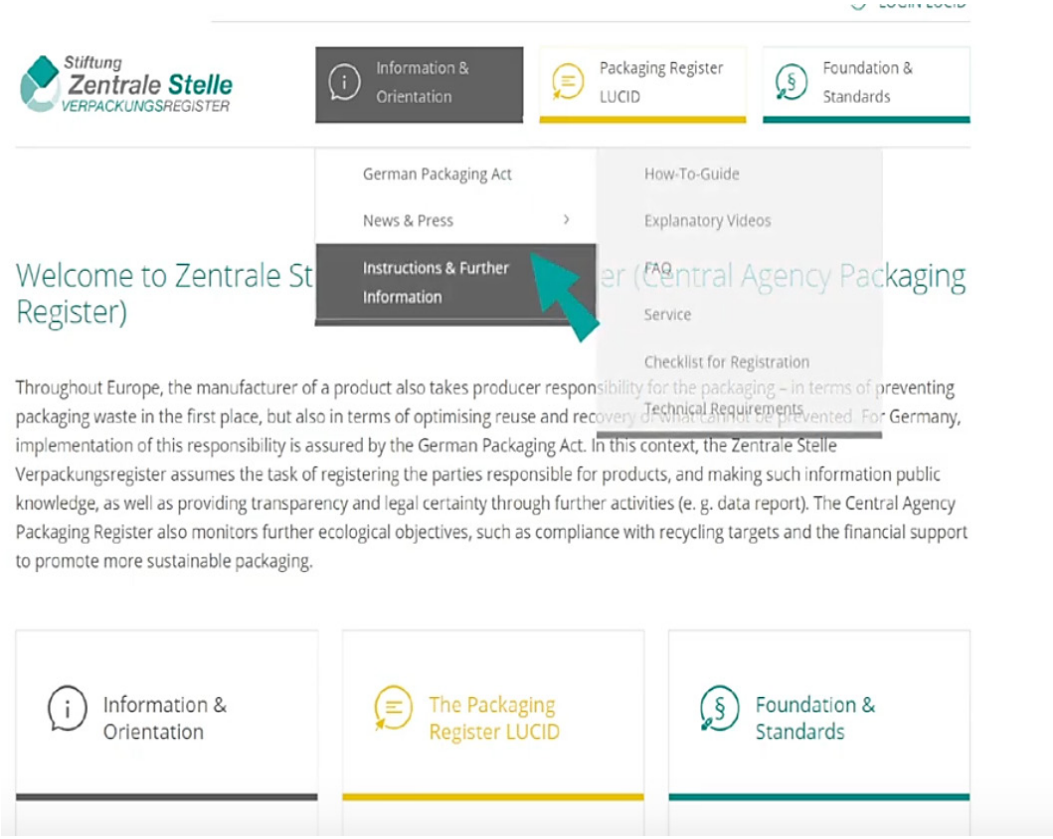

Figure 24: Producer registry form (Source: Stiftung Zentrale Stelle - Verpackungsregister, 2020)

PRO membership management and sales administration

This piece of software is to a large extent comparable to the registry and there can be some functional overlap, as PRO also need to process registration and declaration information in their system for the sake of planning the operations, invoicing the producers and generating any compliance reporting needed.

However, it usually includes additional features such as sales journal, invoice and credit notes generations, various data analysis and reporting functions and some CRM capability.

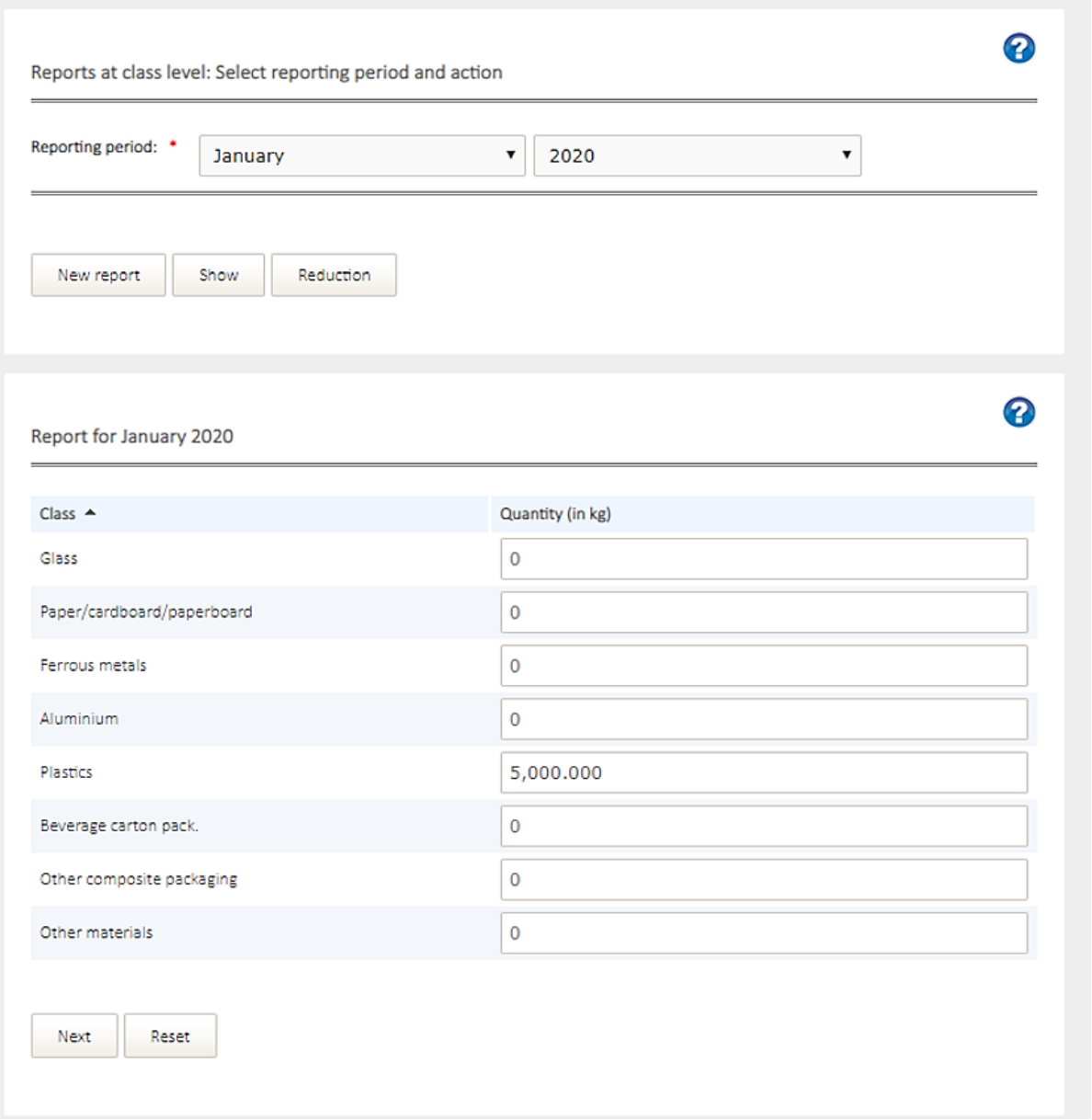

Figure 25: PRO membership management and sales administration (Source: Landbell AG, 2020)

PRO Operations managements

The coverage of operations is oviously highly dependant on the role of the PRO, whether purely financial or also organisational and operational. For the latter, a system to track and verify waste movements (transactions), sorting and treatment is needed. This ensures the consistency of the data reported and provides a portal for evidence documentation, which can then be used as basis for audit and improvement. Such a system can also extend into transaction management (i.e; triggering movements) along the reverse chain, until final treatment. Such systems can be made accessible by the PRO to both the formal and informal operators.

For the latter, mobile applications can facilitate their integration in the reverse chain (via the use of mobile phones).

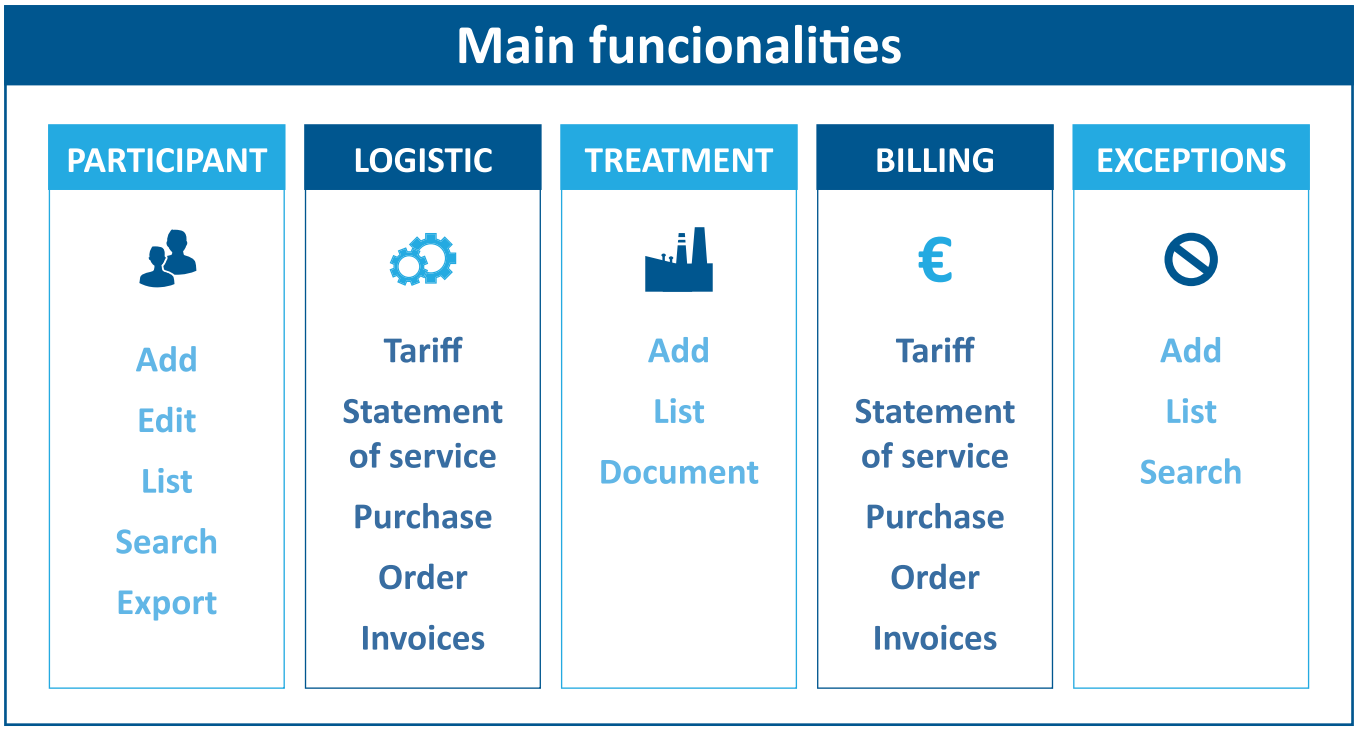

Figure 26: PRO Operations managements (Source: Landbell AG, 2020)

8. Conclusion

EPR implementation in Egypt is strongly supported by both WMRA and the private sector. The implementation will require a clear regulatory framework for a mandatory EPR system.

Prior to this the performance of a pilot project will provide valuable information and experience and will be a good basis for further stakeholder consultations.

The regulatory framework will clarify, beside the roles and responsibilities of all parties involved, the type of PRO that will implement the EPR activities at national levels.

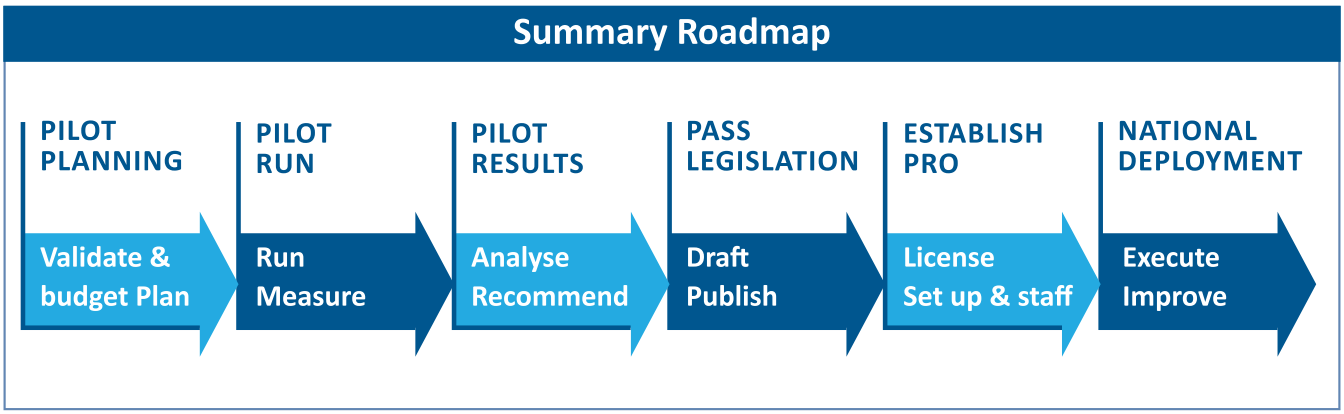

Figure 27: Roadmap of EPR System in Egypt (Source: Landbell, 2021)

9. Annex

EPR – A producer's perspective

Through a series of one-to-one meetings in Cairo and during a virtual meeting held on 16th December 2020 and attended by several stakeholders from the private sector, including major FMCG producers, it has been possible to capture the producers' standpoint on EPR implementation in Egypt.

First of all, there is a general support toward adopting sustainability measures in relation to waste packaging and waste plastics in particular.

Discussion with the participants brought to light the followings:

- Existing initiatives in CSR and/or ERP, whether at individual or collective levels;
- Concerns and expectations regarding the Executive Regulations to follow the Law n° 202 on Waste Management;
- Requirements and visions for a successful EPR implementation in Egypt.

Existing EPR initiatives

An EPR coalition consisting of Unilever, Coca Cola, Pepsi Cola, Nestle, P& G and BariQ (a PET recycler) has been organised to flexibly address plastic waste on the field. While the intention of the participants into this alliance is not to implement jointly projects, but rather contract services providers individually, this initiative allows for some level of coordination on some issues.

In the context of upcoming EPR regulation this provide valuable practical experience and a kernel of a collective approach.

As an example, Coca-Cola and Bariq have announced in December 2020 the launch of "the largest plastic waste sorting facility in Cairo".

Meanwhile, Nestlé launched Dorna, an initiative in collaboration with the Ministry of Environment to boost plastic recycling by incentivising the informal sector through a digital payment solution (e-wallet). Initial results show a collection and recycling of 6,000t of PET during the first 11 months, and involving over 1,000 waste pickers for a distributed incentive amount of EGP 3.2M.

Juhayna Food Industries is partnering with Tetra Pak o develop paper recycling technology.

Other companies have also set themselves goals for waste collection and recycling.

Concerns and expectations

The Law n° 202 of 2020 Promulgating the Law on Waste Management introduces EPR in its Article 17; however, pending the publication of the subsequent Executive Regulations, a number of questions remain unanswered.

Among the most pregnant topics for the producers is the definition of Recycling, which under the current regulations, does not allow the use of recycled plastic for its original purpose. In order to allow closing the loop, it would be necessary to change the definition of Recycling.

Producers also expressed the need for a precisely defined scope of obligations in the Executive Regulations and in particular detailing how EPR will be defined and implemented. Similarly, technical aspects have to be

detailed carefully, such as how to classify hazardous and non-hazardous waste, or how to ensure consistency of the technical specifications covering regulated products.

Financial concerns also have been expressed, such as what will be the costs for waste generators, the license costs, the Waste to Energy tariffs or the incentives attached to the Green Mark. In order to limit the financial impact, producers have expressed a preference for a gradual introduction of products and obligations in the Executive Regulations.

Requirements and vision for a successful EPR implementation

Producers appear to be ready and willing to take control of EPR, and generally favour an EPR driven by the private sector over a tax alternative, like a materials tax or similar.

Beside this statement, there is an underlying preference for a flexible EPR framework that would allow different compliance models, rather than a unique model for all companies. This could lead into a coexistence of collective EPR system with individual EPR system for instance, or producers taking an active role in recycling.

Additionally, a practical and effective implementation of EPR will require:

- An operational approach on EPR;
- Clear and unequivocal technical specifications;
- Addressing relevant materials, even if they are hard to recycle;
- Development of the collection and recycling infrastructure;
- Involvement and suitable management of the informal sector;
- Taking the consumer in perspective, in particular as to what is acceptable for consumers in the early stages of EPR;
- Suitable incentives for stakeholders;
- Gradual enforcement of regulations via a transition framework. Imprint

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