



NATIONAL GUIDANCE FOR PLASTIC POLLUTION HOTSPOTTING AND SHAPING ACTION

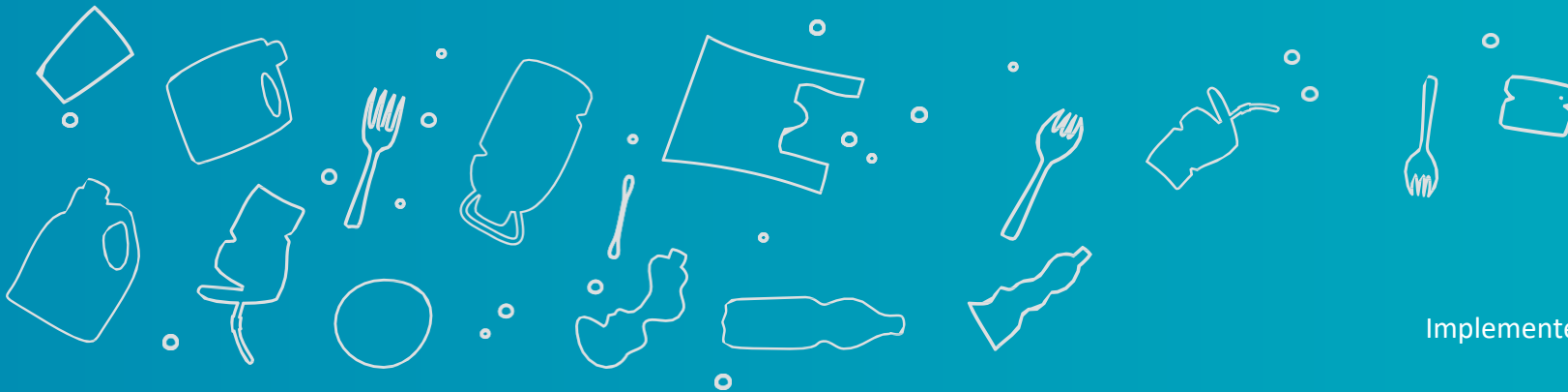


MODULE

T2

Characterisation of Waste Management

September
2020



Implemented with



NATIONAL GUIDANCE FOR PLASTIC POLLUTION HOTSPOTTING AND SHAPING ACTION

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HOW TO READ THIS DOCUMENT



MODULE

Modules are the instruction for the tools. Each module is composed of one or several tools. Technical modules focus on generating hotspot information by the technical team. Strategic modules focus on generating interventions and instruments by involving a wider group of stakeholders.



TECHNICAL MODULE



STRATEGIC MODULE



TOOL REFERENCE

Tools are the building blocks of the guidance. Tools are of three categories: input tools (for data collection), assessment tools (to generate the hotspots, interventions and instruments) and output tools (to provide summarised information and shareable data repository).



INPUT TOOL



ASSESSMENT TOOL



OUTPUT TOOL

White background

WORKFLOW SLIDE

Describes key stages and main actions to run the module and associated tools.

Grey background

SUPPORTING INFORMATION

Provides supporting information, references of background data.


Blue background

DEFINITIONS AND DESCRIPTIONS

Provides key definitions and high level objectives of the modules and tools.



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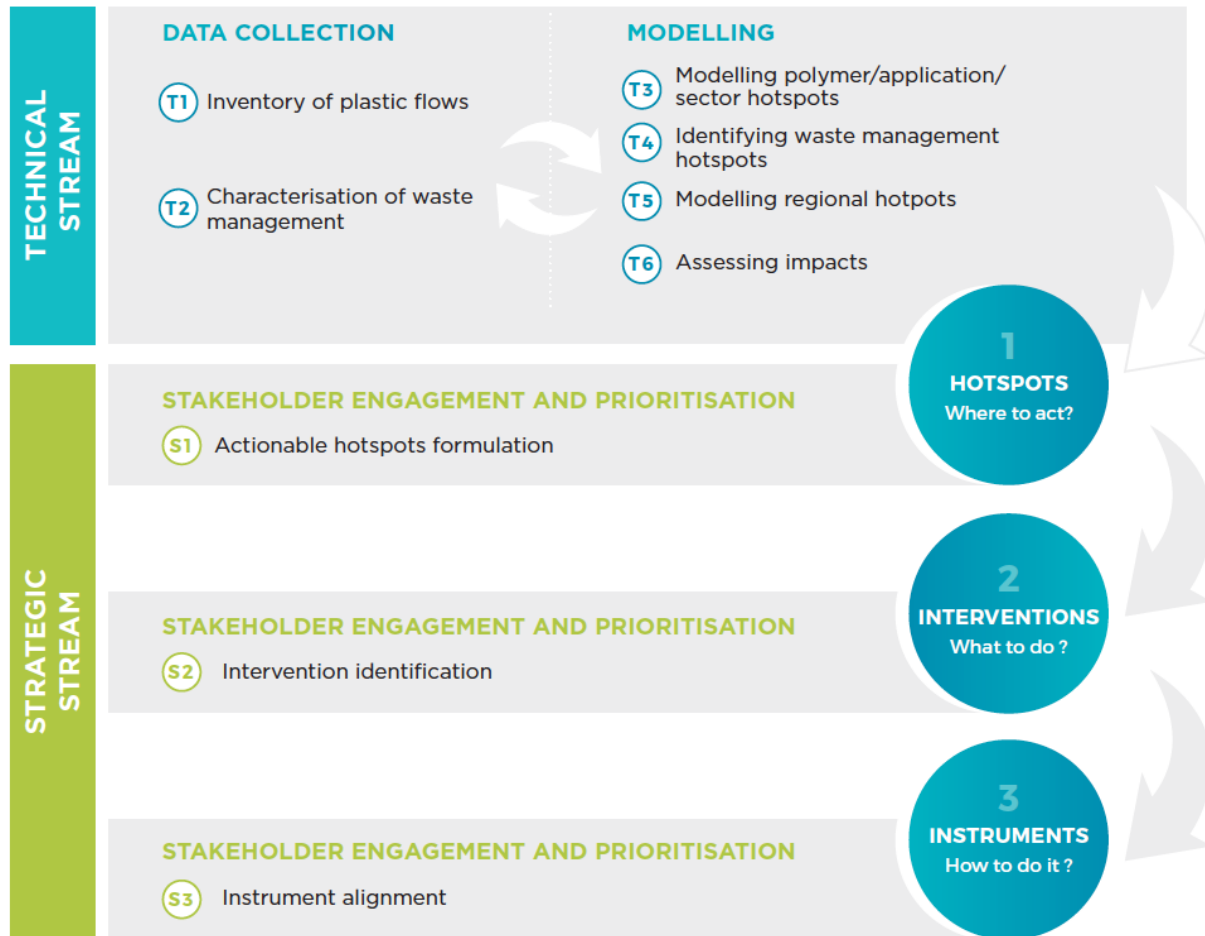
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OBJECTIVE OF THE MODULE

This module aims at guiding the user in data collection, with a focus on waste management.

The objective is to obtain data and information to better understand the waste management system at national, sub-national or local level for plastic hotspot identification in modules T4-T5.



RELATIONSHIP OF MODULE T2 WITH OTHER MODULES

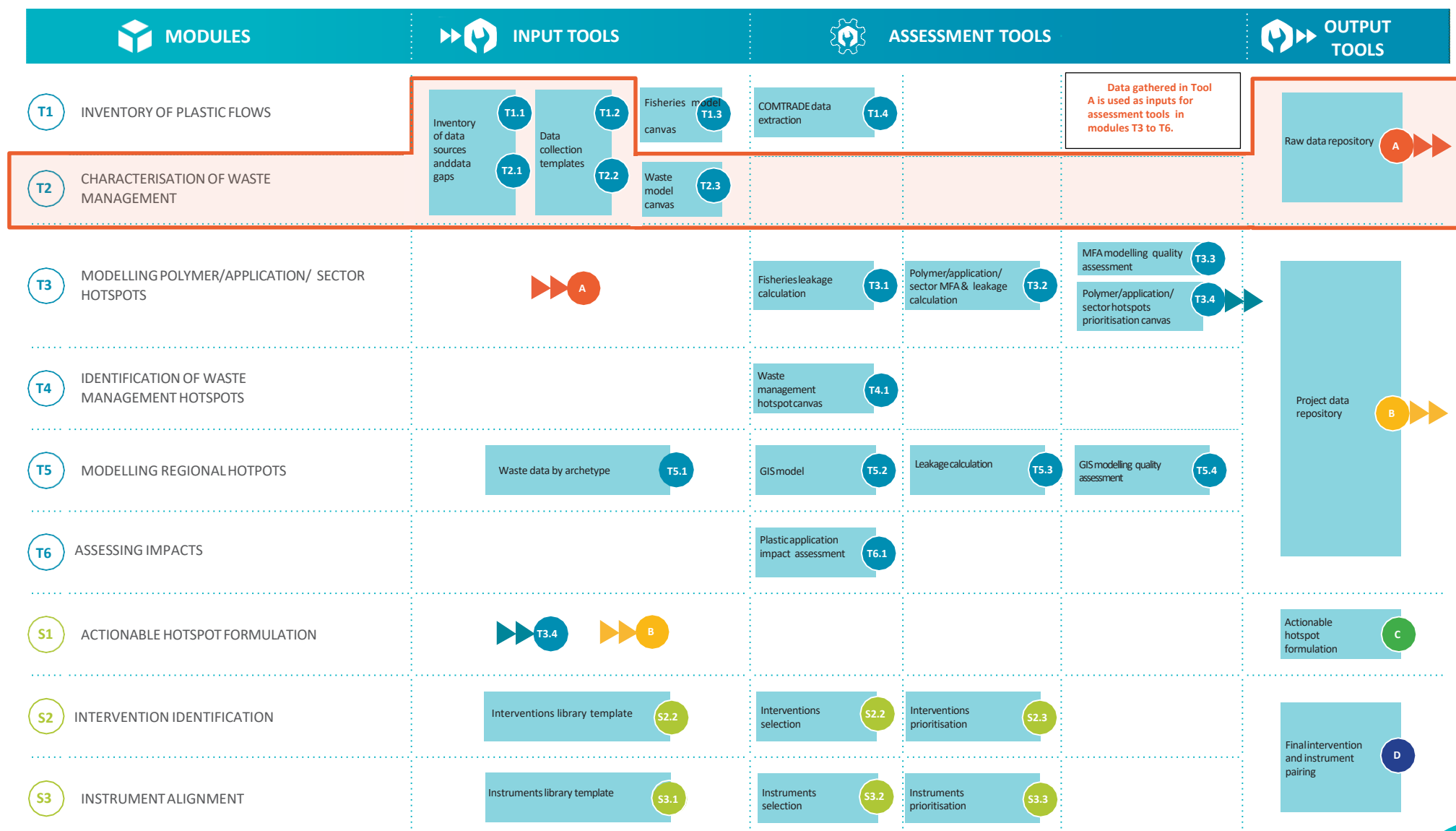
Module T2 is part of the technical work stream. The result of this module is an inventory of quantitative information on waste management gathered either from literature or from targeted data collection efforts, in order to prepare inputs for modelling modules T3 and T5.

Modules T5 uses the output of Module T2 to create a comprehensive picture of waste management across the geographical region of interest and determine the plastic leakage. Output from module T5 are then used by module T3 to recover waste management and leakage quantities by polymer, application and sector.



T2

TOOLS ASSOCIATED WITH MODULE T2



EXCEL TOOLS ASSOCIATED WITH THIS MODULE (1/2)

T2.1



INVENTORY OF DATA SOURCES AND DATA GAPS



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB	JC	JD	JE	JF	JG	JH	JI	IJ	JK	JL	JM	JN	JO	JP	JQ	JR	JS	JT	JU	JV	JW	JX	JY	JZ	KA	KB	KC	KD	KE	KF	KG	KH	KI	KJ	KK	KL	KM	KN	KO	KP	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KZ	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	LK	LL	LM	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MN	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX	MY	MZ	NA	NB	NC	ND	NE	NF	NG	NH	NI	NJ	NK	NL	NM	NN	NO	NP	NQ	NR	NS	NT	NU	NV	NW	NX	NY	NZ	OA	OB	OC	OD	OE	OF	OG	OH	OI	OJ	OK	OL	OM	ON	OO	OP	OQ	OR	OS	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PC	PD	PE	PF	PG	PH	PI	PJ	PK	PL	PM	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QG	QH	QI	QJ	QK	QL	QM	QN	QO	QP	QQ	QR	QS	QT	QU	QV	QW	QX	QY	QZ	RA	RB	RC	RD	RE	RF	RG	RH	RI	RJ	RK	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RU	RV	RW	RX	RY	RZ	SA	SB	SC	SD	SE	SF	SG	SH	SI	SJ	SK	SL	SM	SN	SO	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY	SZ	TA	TB	TC	TD	TE	TF	TG	TH	TI	TJ	TK	TL	TM	TN	TO	TP	TQ	TR	TS	TT	TU	TV	TW	TX	TY	TZ	UA	UB	UC	UD	UE	UF	UG	UH	UI	UJ	UK	UL	UM	UN	UO	UP	UQ	UR	US	UT	UU	UV	UW	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VG	VH	VI	VJ	VK	VL	VM	VN	VO	VP	VQ	VR	VS	VT	VU	VV	VW	VX	VY	VZ	WA	WB	WC	WD	WE	WF	WG	WH	WI	WJ	WK	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WU	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XE	XF	YG	YH	YI	YJ	YK	YL	YM	YN	YO	YP	YQ	YR	YS	YT	YU	YV	YW	YX	YY	YZ	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	ZL	ZM	ZN	ZO	ZP	ZQ	ZR	ZS	ZT	ZU	ZV	ZW	ZX	ZY	ZZ	AA	AB	AC
	TANZANIA														WASTE MANAGEMENT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	Resource title	Type	Year	Publication Year	Plastic Use for waste collection	Waste management plan	Waste collection routes	Waste management	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan	Waste management plan																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									

TYPE: :
INPUT TOOL



OBJECTIVE:

Allows to inventory relevant data sources to feed data inputs for the modelling modules and helps identify data gaps.

T2.2



DATA COLLECTION TEMPLATES

[illegible]

TYPE:
INPUT TOOL



OBJECTIVE:

Provides survey questionnaires to collect data on specific topics such as waste management and waste characterisation.

These tools are available in the Excel Spreadsheet associated with this module.



T2

EXCEL TOOLS ASSOCIATED WITH THIS MODULE (2/2)

T2.3

WASTE MODEL CANVAS



WASTE MODEL CANVAS

Name : _____
Total population : _____
Rural / Urban Coastal / Inland

1 Waste Generation	2 Waste Collection	3 Waste Logistics	4 Waste Treatment
HOUSEHOLDS Total: _____ Per capita : _____ 	Formal collection Informal collection Post littering collection Post leakage collection Non-collected	Door to door Collection points Transfer stations Other	Dumpsite + non-sanitary landfills Sanitary landfills Incineration Informal recycling Formal recycling Open burning
MEDICALS COLLECTED _____ INDUSTRIAL COLLECTED _____ OTHERS COLLECTED _____			

TYPE:
INPUT TOOL



OBJECTIVE:

Canvas for guiding interviews with municipalities or waste management organisations (waste collection, plastic waste recycling, etc.)



RAW DATA REPOSITORY



Waste data by archetype

Examples of regional classification by archetype are Rural / Urban, Regions, Provinces, Coastal/Rural/Remote/MegaCity etc. Depending on the country different type of data can be available. Collect here all available data on:

- Waste generation by archetype
- Share of collection by archetype
- Sanitary landfill capacity by archetype
- Share of plastic in the Waste stream

Example from South Africa "National guidance for plastic pollution hotspotting and shaping action", IUCN, 2020

Waste generation rates (kg/cap/day) in provinces by income level

Final share

Province	Waste generation low income	Waste generation middle income	Waste generation high income
Limpopo	0.10	0.41	0.75
Mpumalanga	0.07	0.78	1.12
Gauteng	0.38	0.68	0.68
North West	0.07	0.78	1.12
Free State	0.02	0.78	1.12
KwaZulu Natal	0.07	0.78	1.12
Northern Cape	0.02	0.78	1.12
Eastern Cape	0.07	0.78	1.12
Western Cape	0.02	0.78	1.12

New data

Province	Municipality	Waste generation low income	Waste generation middle income	Waste generation high income	Source
South Africa		0.02	0.7	0.74	1.29 South African Department of Environmental Affairs and Tourism (DEAT), South Africa environment outlook: A report of
South Africa		0.2	0.4	0.7	0.7 Dphela (Zimbabwe), Management of municipal solid waste in Limpopo Province, South Africa, in: A
Limpopo		0.02	0.66	0.18	0.80 Limpopo Department of Agriculture and Rural Development, General waste management plan for Limpopo, Johannesburg
Gauteng	Municipality	0.10	0.18	0.18	1.10 Limpopo Department of Agriculture and Rural Development, General waste management plan for Limpopo, Johannesburg

Sheet: "T2_Waste_Input_for_T5.1"

TYPE:
OUTPUT TOOL



OBJECTIVE:

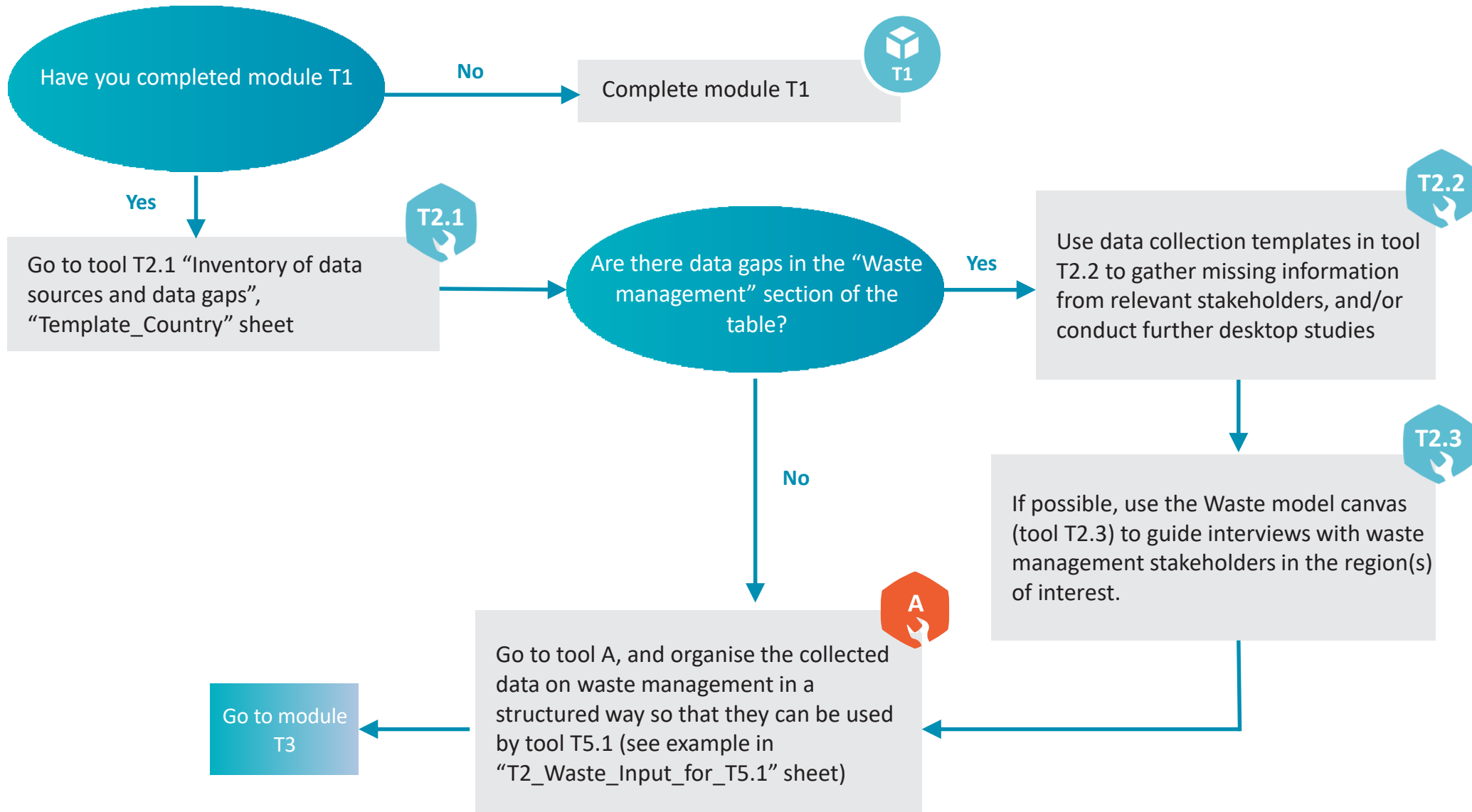
Gather all quantitative information on waste management that can be useful to inputs for modelling modules T3, T4, T5 and T6.

These tools are available in the Excel Spreadsheet associated with this module.



T2

HOW TO USE THIS MODULE?





TOOL

T2.1

Inventory of data sources and data
gaps

HOW TO USE THIS TOOL ?

The excel file T1.1-T2.1 contains two sheets both used for modules T1 and T2. The first sheet “Template_Country” provides an empty table to fill with data for the area of interest, while the second sheet “Example_SouthAfrica” provides a completed table as a reference for the user.

(5)

[illegible]

For each useful resource, insert the title **(1)** (descriptive enough to understand what it is), the type of information **(2)** (report, article, database, website, interview), the year of publication **(3)** and a link to access the data source **(4)** (if available). Then, tick the box below metric or topic names for which data has been found in the resource and optionally comment to specify data values or explain where to find information within the document **(5)**.



DESCRIPTION OF THE APPROACH IN TOOL T2.1

- Many data-sources are available but they do not easily fit into a coherent framework
- We propose an economy-wide MFA (material flow analysis) framework for plastic accounting.
- Our intention is not to generate complex material flow analysis but to provide a guidance on how to answer some of the key questions that will be useful to understand the national plastic economy and identify relevant hotspots and interventions.
- We thus also propose a matrix framework, not focussing on building a coherent flow diagram, but mapping these key metrics.
- Depending on the level of information available and effort undertaken, some of these metrics may or may not be compiled.
- The proposed framework offers a global picture and a way to assess situation and level of knowledge related to plastic in the country.



TOOL

T2.2

Data collection templates

HOW TO USE THIS TOOL ?

The excel file T1.2-T2.2 contains several data collection templates both for modules T1 and T2. The first set of sheets provide questionnaires for T1 on plastic flows and specific sectors (*Production, Recycling, Fisheries, Tourism, Road Transport*), while the second set of sheets rather aims at collecting data for T2 on waste management at large (*Waste management, Waste characterisation, Littering management, Waste water management*)

The data collection templates are often organised in three sections:

- Contextualisation of the data provided **(1)** with the name and institution of the contact person, the year of reference and general questions on the topic.
- Key data values or estimates **(2)** (for instance, detailed production quantities for each polymer)
- Qualitative questions **(3)** to better understand the representativeness of the data provided in section 2 (for instance, if data provided is representative of the country average, etc.)

These templates are intended to cover a wide range of data needs for the project, but can be either revised or duplicated to cover other topics when the context of a country calls for it.

(1)
(2)
(3)

Waste management

WHY WE NEED DATA/INFORMATION
The key questions that we are trying to answer are:
How much plastic waste is collected ?
How is this plastic waste managed / not managed ?

HOW TO PROVIDE THE DATA/INFORMATION
Any type of quantitative data or qualitative information will be useful. The templates include 3 sections : (i) contextual information, (ii) quantitative data (when available), and (iii) other data/information.

(i) Context of the data/information provided
The context data informs about the scope and boundaries associated with the provided data, so each data can be associated with a given archetype (i.e. a region with a set of homogeneous characteristics)

	Data / Information	Comment
Name of contact / institution		
Year of reference		
Name of region(s) / area covered		
Urban or Rural		
If you serve households, what is the number of inhabitants or households you		
If you serve industries, how many industries do you collect waste from?		
If you serve industries, what type of industries?		
Quantity of waste collected in kg/year?		

(ii) Key data
The data is can be provided as a % of the waste stream in your area if available or in absolute value (e.g. tonnes). If none of this information is available any sort of qualitative information will be highly appreciated.

	Percentage	Absolute quantity	Comment / Source
How much of the waste you collect is plastic?			
How much of the waste you collect goes to:			
Sanitary landfill			
Non-sanitary landfill			
Open dump			
Recycling			
Burning			
Incineration without energy recovery			
Incineration with energy recovery			
Other forms of mismanagement			
Other forms of management (e.g. pyrolysis)			

(iii) Qualitative aspects
This last section will help us better the waste management sector in your country

	Comments
What is the role of the private sector in waste management?	
What is the role of the informal sector in waste management?	
Are there dump-sites in the country ?	
Are there dump-sites close to the sea-shore ?	
Are there sanitary landfills in the country?	
Is burning of uncollected waste a diffused habit? Does it happen more in rural or urban areas? Does it happens in turistic areas? Of the waste that is uncollected, how much would you say is burned?	
Do you think the information you shared with us are representative of the country average? If not, why?	



TOOL

T2.3

Waste model canvas

HOW TO USE THIS TOOL ?

The Waste model canvas is a tool that we advise to use in order to guide interviews with stakeholders belonging waste management system. It can also be used as a useful mind-map for the user, to better understand the different steps of the waste logistic, from sources of waste generation, through different collection steps, to the waste disposal.

The input quantities requested usually refer to **general waste**, and are not plastic specific. Indeed, plastic-specific quantities on waste generation, waste collection and waste treatment are usually hardly available in many countries around the globe.

Nonetheless, pie-charts are available in each section to keep track of the **plastic share**, when available.

The canvas invites to distinguish between hoshouls waste (municipal solid waste) and medical/**industrial** and other types of **waste**, which normally follow different pathways and are under the responsibility of different authorities.

WASTE MODEL CANVAS

Name :
 Total population :
 Rural / Urban Coastal / Inland

1 Waste Generation

HOUSEHOLDS

 Total:

 Per capita :

% plastic

MEDICALS COLLECTED

INDUSTRIAL COLLECTED

OTHERS COLLECTED

2 Waste Collection

Formal collection

Informal collection

Post littering collection

Post leakage collection

Non-collected

3 Waste logistics

Door to door
Collection points
Transfer stations
Other

% plastic

4 Waste Treatment

Dumpsite + non-sanitary landfills

Sanitary landfills

Incineration

Informal recycling

Formal recycling

Open burning



A

Project data repository

HOW TO USE THIS TOOL ?

The output tool A is an aggregator of already existing data on plastic production, consumption, and waste management, structured in a coherent and functional way so that they can be used as an input for the modelling modules.

Tool A gathers output from both module T1 and module T2. The output sheet “T2_Waste_Input_for_T5.1” asks for waste management data organised by archetype. Archetypes are regions that experience similar waste generation and management patterns within the region. Examples of archetypes are: Rural / Urban, Provinces, Coastal / Rural / Remote / MegaCity, etc. This type of data varies widely from a country (or region of interest) to the other, and it is why there is no predefined structure imposed to the user in tool A for what concerns output of module T2. An example for South Africa is available to give an idea.

Description of data needed

Example for South Africa

Waste data by archetype				
Gather waste management data by archetype				
Examples of regional classification by archetype are: Rural / Urban, Regions, Provinces, Coastal / Rural / Remote / MegaCity etc				
Depending on the country different type of data can be available				
Collect here all available data on:				
<ul style="list-style-type: none"> - Waste generation by archetype - Share of collection by archetype - Sanitary landfill capacity by archetype - Share of plastic in the Waste stream 				
Example from South Africa "National guidance for plastic pollution hotspotting and shaping action", IUCN, 2020				
Waste generation rates (kg/cap/day) in provinces by income level				
Final choice				
Province	waste generation low income	waste generation middle income	waste generation high income	
Limpopo	0.32	0.4	0.7	
Mpumalanga	0.37	0.78	1.52	
Gauteng	0.38	0.66	0.99	
North West	0.37	0.78	1.52	
Free State	0.41	0.74	1.29	
KwaZulu-Natal	0.37	0.78	1.52	
Northern Cape	0.41	0.74	1.29	
Eastern Cape	0.37	0.78	1.52	
Western Cape	0.41	0.74	1.29	
Raw data				
Province	Municipality	waste generation low income	waste generation middle income	waste generation high income Source
South Africa		0.41	0.74	1.29 South African Department of Environmental Affairs and Tourism (DEAT). South Africa environment outlook. A report on the state of the environment. Pretoria: DEAT; 2000
South Africa		0.2	0.7	1.5 North West Provincial Government Department of Agriculture, Conservation and Environment. Provincial integrated waste management plan (PIWMP) status quo report
Limpopo		0.32	0.4	0.7 Ogolaj, Chimuka, Thivhase Management of municipal solid wastes A case study in Limpopo Province, South Africa. In: Kumar S, editor. Integrated Waste Management. Vol. 1. Cape Town: Elsevier; 2018
Gauteng		0.38	0.66	0.99 Gauteng Department of Agriculture and Rural Development. General waste minimisation plan for Gauteng. Johannesburg: Gauteng Department of Agriculture and Rural Development; 2018
Eastern Cape	Buffalo City	0.37	0.78	1.52 Buffalo city municipality (Eastern Cape) WM flagship report 2018 (SA_r10)
North West	JB Marks	0.37	0.78	1.52 JB Marks Local Municipality (North West) WM flagship report 2018 (SA_r11)
Eastern Cape	King Sabata Dalindyebo	0.37	0.78	1.52 SA_r12_King Sabata Dalindyebo municipality (Eastern Cape) WM flagship report 2018
Limpopo	MagM	0.37	0.78	1.52 SA_r13_MagM (Limpopo) WM flagship report 2018
KwaZulu-Natal	Newcastle	0.37	0.78	1.52 SA_r14_Newcastle Municipality (KwaZulu Natal) WM flagship report 2018



Life Cycle Initiative

Implemented with



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