Conceptual note on H2020 waste indicators

25 September 2017

Introduction

This note aims to open the discussion on the use of proper indicators that will link marine litter (ML) and municipal solid waste management (SWM). The general view of the note is that there is a need to build further on the work that has already been done, taking into account the experiences gained, the linkages between marine litter and waste management, as well as the scientific evolution of the waste indicators.

The main scope of the author is to identify the improvements required in order to have indicators that will be:

- Better describe and reflect the linkages between SWM and ML
- Representative of the recent findings on ML quantities and composition
- Linked with the shift to Circular Economy (CE)
- Suitable for decision makers and decision takers

In addition, the indicators should cover the general criteria that have been set in the recent meeting in Copenhagen[1]. They must:

- Be simple, straight-forward, concise, easy to interpret,
- Be issue specific yet relevant to all countries,
- Build on existing indicators process in the region to ensure full use of existing information and data,
- Provide realistic and representative baseline of the current situation,
- Contribute to a balanced DPSIR distribution,
- Provide a comprehensive, yet non-exhaustive coverage of the priority areas,
- Allow for periodic review and update in line with future developments.

The structure of the note is as follows.

A. Solid Waste Indicators in use

B. Experiences gained

C. Marine Litter and Solid Waste Linkages

D. The evolution of waste indicators

E. Proposed Indicators

F. Key-questions to be discussed

[1] Cécile Roddier-Quefelec, Review of H2020 indicators - Group Work, 1st ENI SEIS II South Support Mechanism Regional workshop on indicators 17-18 May 2017, Copenhagen, Denmark

A. Solid Waste Indicators in use

The current indicators in use by H2020 are:

IND 1 - Municipal waste generation

IND 1.A Municipal waste composition

IND 2 - Collected and treated municipal waste

IND 2.A Number, type and location of landfills

The proposed core NAP indicators in the recent meeting in Copenhagen (with their numbers) are the following[2]:

11. Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities

12. Share of recycled, landfilled and incinerated municipal waste with respect to collected amount

13. Amounts / trends of ML washed ashore and/or deposited on coastlines, including analysis of its composition, spatial distribution, and where possible, source

14. Index of coastal eutrophication and floating plastic debris density

15. Share of existing illegal solid waste dumpsites on land that have been closed (in past 10 years) with respect to the total number

In the same meeting, there were two key-suggestions.

a. To expand IND2 to integrate the core NAP indicator 12: "Collected municipal waste and share of treated (recycled, landfilled, and incinerated) municipal waste with respect to collected amount", and
b. To make core NAP indicator 15 a sub-indicator to IND2 or a new indicator: "Share of existing illegal solid waste dumpsites on land that have been closed (in past 10 years) with respect to the total number"

It is important to notice that in the Horizon 2020 Mediterranean report[3], there are several other indicators in use, as follows.

- Municipal solid waste generation (MT/year)
- Municipal solid waste generation per capita (kg/year)
- Municipal solid waste generation (g/USD)

[2] Stavros Antoniadis, Indicator processes at UN Environment/MAP Core NAP follow-up indicators, 1st ENI SEIS II South Support Mechanism Regional workshop on indicators 17-18 May 2017, Copenhagen, Denmark

[3] Horizon 2020 Mediterranean report, EEA Technical report No 6/2014

- Organic material (%)
- Collection rate (%)
- Openly dumped (%)
- Sanitary landfilled (%)
- Recycled (%)
- Composted (%)
- Number of open dumps
- Number of sanitary landfills
- Investment projects on solid waste
- Institutions in charge of policy and planning
- Private sector involvement

Interestingly, the last three indicators (investments, institutions and private sector involvement) concern non-technical but rather administrative and policy issues related to SWM.

B. Experiences gained

The summary of the recent meeting in Copenhagen[4] provides good insights regarding the experiences and the views related to the use of the current indicators. Here are the main remarks from the Summary Report (column 1) together with some comments (column 2).

Table 1: Insights from the meeting in Copenhagen

INSIGHTS	COMMENTS
IND 1: Municipal waste generation and composition should remain. However, countries expressed their concerns on the lack of data on waste generation as the indicator is currently based on estimation. The country representatives expressed the need to have project support to develop waste survey and update production coefficient. As regards composition, the participants stressed the need to have data on plastics reaching the sea (using existing marine litter projects).	1. The concerns are right, especially because a lot of the estimations in place are not made in a similar way, with common assumptions and methodologies, and common definitions. Besides the necessary surveys, there is another way to cross-check the results by adjusted them using the much more reliable and accountable economic statistics like the GDP/cap etc. 2. There is definitely a need to measure and monitor plastics as they are the most important element of ML
The participants proposed to split IND 2 and consider collection and treatment separately (i.e. Municipal waste collected; Municipal waste treated). As regards waste treatment, special reference should be made to the type of treatment. Suggestion was made to integrate the NAP common indicator 12 (and SDG 12.5.1) "Share of recycled	1. It seems that mechanical biological treatment and composting are missing from the proposed typology of treatment. 2. Usually, collection efficiency is measured separately from treatment and disposal – the reason is that in many

[4] Summary Report V.3, 13/06/20171st ENI SEIS II South Support Mechanism Regional workshop on indicators 17-18 May 2017, Copenhagen, Denmark

landfilled and incinerated municipal waste with respect to collected amount". New indicator could be labelled as Municipal waste treated, by type of treatment (recycle, landfill, incineration) and share of treatment with respect to collected amount.	cases there is regular waste collection but uncontrolled disposal. 3. Do we have a clear definition on recycling? Do we consider informal recycling systems too?

There was a suggestion to consider having a separate indicator on recycling. Under this indicator, specific information can be requested for plastics (e.g. share of plastics recycled with respect to the total amount of waste recycled).	Recycling is necessary to be measured as a separate indicator, especially for plastics. However, besides a common definition, we need to consider other elements like reuse, energy recovery and waste prevention, if we want to have a complete picture.
The existing H2020 sub-indicator "number, type and location of landfills" should be a separate Indicator "Number, type and location of landfills". Under this indicator, the NAP common indicator 15 could be a sub-indicator "share of existing illegal solid waste dumpsites on land that have been closed (in the past 10 years) with respect to the total number. Some countries expressed concerns as regards data availability for this indicator.	There is a need to clarify what is a sanitary landfill and what is a dumpsite. Sanitary landfills are considered legal and safe disposal options because they involve specific operational procedures, anti-pollution works, and environmental monitoring. Dumpsites are uncontrolled disposal sites, with no environmental protection. The problem is that in many Mediterranean countries we have an intermediate solution, usually called "engineered landfill" (in contrast with sanitary). I believe that the number of dumpsites in coastal areas is straightforward linked with the ML quantities.
The countries supported the idea of having an indicator on waste collection efficiency. In this respect, the use of NAP common indicator 11 was suggested for further consideration "Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated by cities". Again, some countries raised the issue of data availability and estimation for waste generation.	There is a need to paint the full picture of waste flows and see where are the most important leakages – collection efficiency is an important factor, but the usual problem is to answer what happens with the non-collected waste. In addition, imagine a case where the collection efficiency might be 100% and then the collected waste is brought to a dumpsite nearby a river or the seashore.
Countries confirmed the usefulness of having waste indicators at coastal level, which require sound statistics of population in coastal areas.	I believe this is a very important point. National figures say very few things for the leakages of waste that is transformed to ML. What we mainly need is to map the coastal cities and their performance, to assess their leakages and provide them suggestions for improvement. The geographical scale in which monitoring and indicators will be applied is a crucial and urgent issue.
Regarding marine litter, the countries expressed concerns on data availability to properly develop indicators, indicating that further work is needed. It was suggested to consider as well the NAP common indicator 14 (SDG indicator 14.1.1) "Index of coastal eutrophication and floating plastic debris density". The country representatives questioned the geographical scale to be applied for marine litter.	The link with the SDGs is a very important point. In addition, we must consider the necessity to link the indicators with the Circular Economy concept, which means to move from the waste view to the resources perspective. This means that we have to consider not only waste, but also Production and Consumption patterns, for a meaningful analysis.

C. Marine Litter and Solid Waste Linkages

Marine litter is a challenge of planetary scale and implications. It is necessary to develop a more integrated perspective regarding ML. ML is not simply related to SWM and recycling, it is a result of a systemic failure, with the following four key-parameters:

(I) The continuous growth in use of thousands of different forms of plastics in each and every aspect of our daily lives.

(II) Poor or absent solid waste management services and infrastructure (mainly in the Med South), and insufficient monitoring & law enforcement (mainly in the Med North).

(III) Problematic and vulnerable markets for secondary plastics, resulting in poor and very fragile incentives for material recovery.

(IV) Lack of a systemic and in-depth understanding of:

- The technical challenges and the restrictions of material properties and the flows of plastics.
- The effects of social consumption patterns and littering behaviours on solid waste generation.
- The impacts of unplanned tourist developments and of the fishing industry.

Here are some key-remarks regarding ML and its relationship with SWM.

<u>Can we control the sources of marine litter?</u>

Most materials that go on to become marine litter could be effectively intercepted before entering aquatic environments by applying sound waste management practices.

Sound solid waste and resources management is the only major effective prevention because, on average, most marine litter originates from on-land activities, mostly because of unsustainable solid waste management practices.

<u>Why intervene upstream at macro-plastic item level?</u>

The bigger plastics waste items are a huge pool of future microplastics, as they degrade within the sea environment – after becoming small they cannot be effectively intercepted; preventing the leakage upstream is the best place to act.

<u>How does the solid waste management sector relate to interception points at generation hotspots?</u>

Major upstream preventative interception points at the sources and at hotspots relate to solid waste: ranging from direct uncontrolled dumping to concentrated littering hotspots of packaging plastic waste.

The solid waste management and resources sector relates to all major sources and hotspots where interventions can be planned and implemented. The key land-based sources of marine litter are numerous and include plastics leaking into the environment as a result of: uncontrolled dumping of waste from municipal sources (organised and unorganised

dumping, fly tipping and direct dumpling into rivers or at/by the sea; littering by members of the public (e.g. through tourism, major public events, or in in busy areas of cities); limited escape of plastics from existing waste management activities during transport, handling, treatment or disposal. Sustainable solid waste management has a role also in controlling other major sources and hotspots: wastewater treatment related flows, if effectively intercepted at treatment plants, are also eventually handled as biosolids in solid waste treatment plants; and control of maritime sources of marine litter (fisheries, shipping sectors (including cargo and leisure), recreational activities) also depends on provision of convenient and affordable solid waste management collection facilities.

How can we know that relevant policies are suitable and work?

Polices to combat and eradicate marine litter can be effective only if they are informed by the challenges around developing sustainable solid waste and resources management systems across the world – monitoring (indicators) need to be suitably linked to waste and resources management evidence.

There is still considerable uncertainty around the detailed flows (sources, pathways, transformations and final fate (sinks)), especially at local/ regional level. This gap in knowledge affects our ability to devise effective mitigating policies. However, no policy will be effective if it does not build upon the knowledge and challenges relating to implementing sound waste management practices in different parts of the world and localised to the socioeconomic and cultural specificities. And to monitor progress, proactive and upstream indicators will be needed – not just identifying concentrations of microplastics but measuring solid waste management performance and major solid waste flows that need to be intercepted. To achieve this, cross-sectorial collaboration will be fundamental.

So, what to do?

Immediate Actions

We need to significantly reduce the 'leakage' of plastics into the environment by intervening at the source: the generation point. This will require action to:

A. Close dumpsites and provide appropriate waste treatment and disposal facilities for all communities. It is estimated that over 3 billion people globally still do not have access to appropriate disposal facilities.

B. Prevent uncontrolled dumping by providing collection services for all. Dumping of wastes causes significant environmental, social and economic impacts, particularly for low income communities. These needs to be provided as a matter of urgency.

C. Prevent littering. Waste items dropped by people 'on the go' or at major events/ gatherings are a key source of plastics that escape into the marine environment. Reducing littering will require proactive engagement with communities, public awareness-raising, and an enhanced understanding people's needs and behaviours.

D. Working with the maritime sector to establish effective take-back systems for recovering waste and recyclable materials from the fishing, shipping and touristic activities.

Mid-term actions

Capturing and enhancing the value of waste plastics. Action on this issue will need to include developing effective collection systems that maximise and stabilise the value of secondary plastics, considering the social and market particularities of each and every municipality and region.

Properly functioning markets. We need a fundamental move away from the current push markets (i.e. collecting more waste for recycling than markets require) to pull markets, driven by sufficient demand. We need to address issues associated with global supply chains and social and environmental justice, and reverse the often-unfair competition with primary raw materials. These changes are needed in the medium term, so that littering/dumpling and therefore wasting used plastics becomes unthinkable. Better data and information sharing on waste and recycled materials at all stages of their use and end-of-life cycle can enable properly functioning, stable markets for secondary plastics.

Thermal recovery. There will be considerable part of plastics that, after first use or cascades, may remain or become unsuitable for a genuinely sustainable materials recovery. It is important that the energy value of this fraction is captured through efficient and well-operated energy from waste plants or quality assured solid recovered fuels.

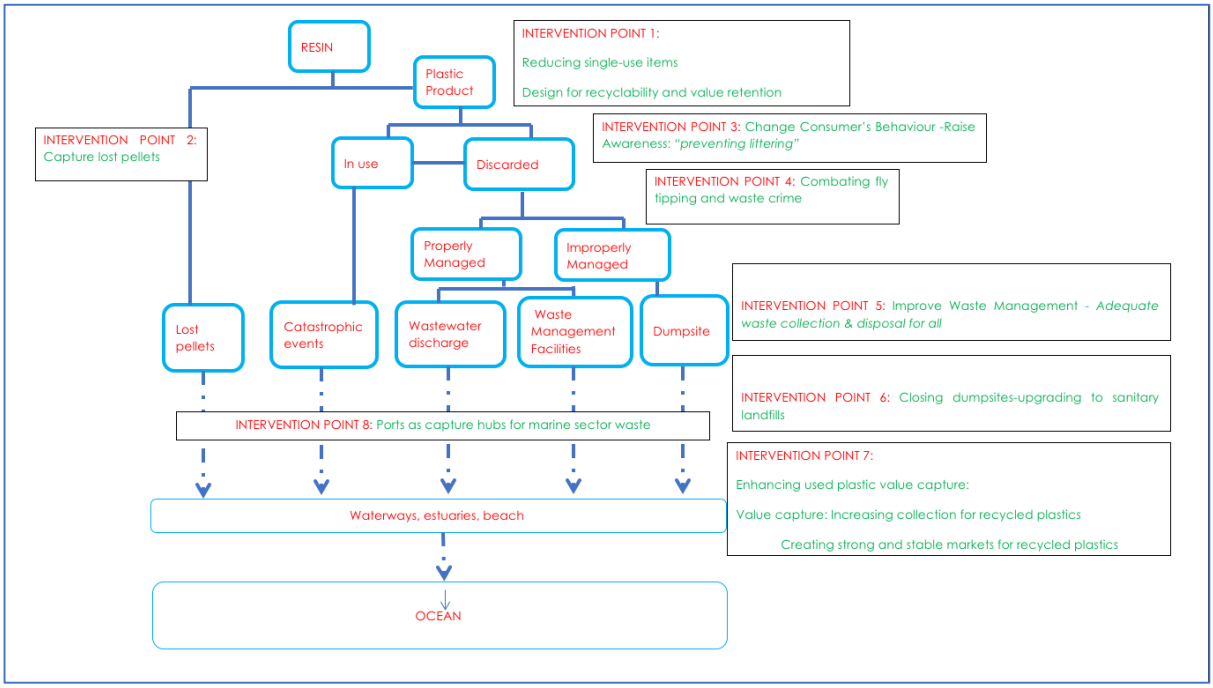
Long-term actions

A step-change from the linear use of plastics to a sustainable and proven circular and cascading system is needed. We need to move from the current situation, where most plastics are used once - with much of this material escaping the system - to a system based on the principles of sustainable and effective circularity and cascading, and clean material cycles, where the use of plastics is minimised and those that are used are collected and cycled back into the system as valuable raw materials and energy. This will require action on many fronts. The generic case has been widely made, but a more detailed and operationalised approach needs to be developed to being about the step change that is needed.

We need to address the issue at the very beginning: Innovate and invent at the materials and processing level. Priority actions could include reducing (i.e. rationalising) single-use items as a matter of priority and developing materials and designing products for recyclability and value retention after the use phase. This requires also a new innovation model that goes beyond cost-effectiveness, functionality during useful life time, and narrowly de ned utility needs to one that incorporates complex value. This will require a radical shift from today's practices, based on a cross-sector and intra-disciplinary scientific collaboration.

Next page presents schematically the linkages and the necessary intervention points between ML and SWM.

Figure 1: Linkages and Intervention Points between ML and SWM[5]



The role of Informal Recyclers Sector (IRS)

There is increasing consensus among all stakeholders and experts that the informal sector in general, and the IRS in particular, should not and, in fact, cannot be ignored while attempting to improve waste and resource management systems in developing countries. Accumulating evidence suggests that these activities can be beneficial to formal municipal waste and resource management, in addition to providing a livelihood to around 0.5% of the urban population. Specifically, informal sector and micro-enterprise recycling, reuse and repair systems achieve considerable recycling rates—often 20–30% wt. in low-income countries. They are also entirely market driven with their only income coming from selling the collected segregated, and often reprocessed, materials and can, thus, save local authorities around 20% or more of what they would otherwise need to spend on waste management, representing many millions of dollars per annum in large cities.

However, persistent factual and perceived issues with the activities of the informal sector, such as occupational and public H&S, child labour, uncontrolled pollutant flows, untaxed activities, association with crime and political collusion, and incompatibility with the image of a modern city result in poor inclusion/integration into official systems, despite the long-standing efforts of external support organisations, such as international donors and non-governmental organisations (NGOs). There is a major opportunity for win–win solutions—building recycling rates, protecting and developing people's livelihoods, addressing the negative aspects of current informal recycling on health and the environment, and reducing

[5] ISWA Task Force on Marine Litter, September 2017

costs to the city of managing its wastes - if the informal sector can be included more successfully within an integrated and sustainable waste management system.

Over the last 10 years research has tried to account, analyse, comprehend and propose solutions to address the key challenges related to the integration/inclusion/formalisation of the informal recyclers, considering waste management, material flows, and socioeconomic, governance and business aspects. Such interventions are described variously as aimed at the 'integration', 'inclusion', 'formalisation' or 'legalisation' of the IRS.

The linkages between IRS and ML have not been studied in full detail, but there is a lot of evidence that the IRS has a positive contribution to ML prevention.

D. The evolution of SWM indicators

In summary, statistics aim to convert raw data into useful information; indicators then help to transform that information into knowledge, which can then be used to make wise decisions.

Performance indicators provide a good basis for assessing the existing situation, carrying out a comparison and tracking changes or progress made over time. For indicators to be useful as a tool for decision makers and politicians, they need to simplify the potential mass of data by being selective, by focusing on the important elements rather than trying to cover all aspects. By doing so, the information the indicators present will be relatively easy to use and understand.

Unfortunately, compiling high quality data on waste and waste treatment has long been a challenge. The available estimates are diverse, not verified or reliable, and often rather outdated. Thus, transforming waste data into reliable waste statistics has proven difficult. Definitely, this situation reflects to Marine Litter Statistics too, in one or another way. Some of the major areas of concern are:

- Lack of standard definitions and classifications
- Absence of measurement and of standard methodologies for measurement
- Lack of standard reporting systems

Interest in performance indicators for solid waste management is long-standing. Researchers have examined the bias issues in the then-standard set of three benchmark indicators: waste generated per capita; proportion of waste being managed by different methods; and proportion of households with a regular collection service. They found that although solid waste planning is a multi-disciplinary field requiring information about the physical, environmental, social, and economic implications of a system, the environmental indicators in use for solid waste do not adequately inform decision-makers about all of these attributes. Therefore, the indicators do not facilitate a holistic approach to environmental planning and policymaking.

Similar indicators are still used as part of composite sustainable development indicators in cities, e.g. an example is the Global City Indicators Facility, which does promise an improvement in the current level of availability of comparable data as more cities sign up. Until recently, the best that the literature can offer on a worldwide basis is compilations of older data, of dubious comparability and often just at the national level.

There has been much recent attention to developing indicators for particular aspects of 'modernising' a solid waste management system. Most of the published research has focused on high-income countries, with only a few that have focused on developing countries. There is a long list of publications regarding indicators about:

- Waste prevention

- Zero waste management systems
- 3R (reduce, reuse, recycle) policies to transition from waste management to resource management
- Extended producer responsibility systems
- Tracking compliance with European Union requirements
- Rank the performance of US cities
- Recycling systems and selective collection for recycling
- Waste collection
- Comparing technologies for waste treatment, recycling and disposal

A notable recent attempt to develop benchmark indicators and apply them to the comparison of cities both North and South was the report prepared for UN-Habitat on the state of solid waste management in the World's cities.

The UN-Habitat work is not the only recent attempt to develop benchmark indicators to compare solid waste management systems in cities. Perhaps the most developed of these alternative approaches is the ten solid waste management indicators which are being tested in over 400 urban local bodies in the two Indian states of Gujarat and Maharashtra[6] as part of a 5-year project to develop and demonstrate a performance measurement framework for urban water and sanitation.

Despite the numerous efforts and sets of indicators that have been created, the global community still lacks common definitions and methodologies that will be applied to the waste sector providing a meaningful description of its complexity. There is a need for an integrated analytical framework capable to be easily understood fro decision makers and decision takers.

Such a tool is described in the recent UNEP – ISWA Global Waste Management Outlook[7]. According this tool, experience suggests that, for a system to be sustainable in the long term, consideration needs to be given to:

• All the physical elements (infrastructure) of the system, from waste generation through storage, collection, transport, transfer, recycling, recovery, treatment and disposal.

• All the stakeholders (actors) involved, including municipalities; regional and national governments; waste generators/service users (including industry, business, institutions and households); producers (those who put products on the market which become waste at the end of their life, including manufacturers, brand owners, importers and others in the supply chain); service providers (whether public or private sector, formal or informal, large or

[6] CEPT University, 2010. Performance measurement framework for urban water and sanitation. Volume I: Approach and framework. Volume II: List of indicators and reliability assessment

[7] UNEP – ISWA, Global Waste Management Outlook, 2015, ISBN: 978-92-807-3479-9

small); civil society and non-governmental organizations (NGOs) (which play a variety of roles, including facilitating the participation of other parties); international agencies; etc.

• All the strategic aspects, including the political, health, institutional, social, economic, financial, environmental and technical facets.

• The term *integrated waste management* has been widely used[8] with a variety of meanings, but often refers only to integration across the physical elements. The concept of Integrated Sustainable Waste Management (ISWM) which explicitly brings together all three dimensions, is gradually becoming the norm in discussion of solid waste management in developing countries.

The concept is described in brief in next figure.

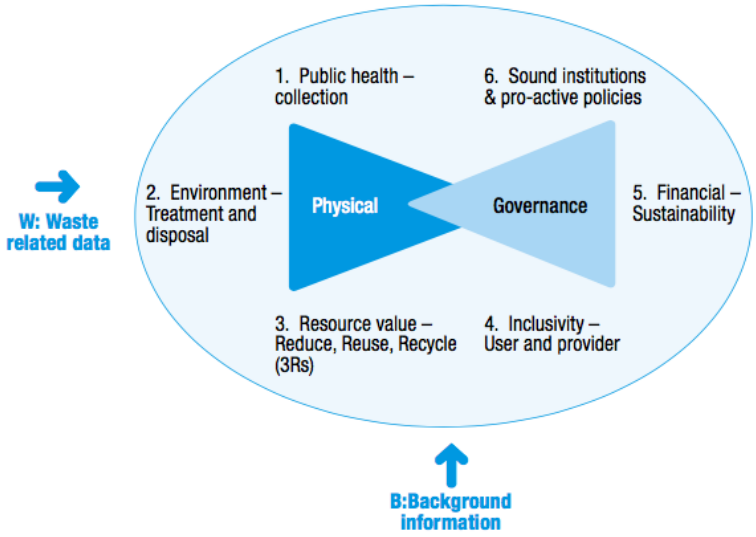


Figure 2: The Integrated Sustainable Waste Management Framework

I strongly suggest using this framework for improving the ML indicators.

The first triangle (sometimes called also as "Hardware") comprises the three primary physical components (elements), each linked to one of the key drivers that are described. These provide the necessary infrastructure for solid waste management:

Waste collection: driven primarily by public health;

Waste treatment and disposal: driven primarily by environmental protection; and

The 3Rs – reduce, reuse, recycle: driven by the resource value of the waste and more recently by 'closing the loop' in order to return both materials and nutrients to beneficial use.

The second triangle (sometimes called as "Software") focuses on the 'softer' aspects of ISWM – the governance strategies:

[8] See UNEP's Governing Council Decision GC 24/5 (2007) and in GC 25/8 (2009)

Inclusivity of stakeholders: focusing in particular on service users and service providers;

Financial sustainability: requiring the system to be cost-effective, affordable and well financed; and

Sound institutions and proactive policies: including both the national policy framework and local institutions.

An integrated and sustainable waste management system must address all technical (infrastructure) and governance aspects to allow a well-functioning system that works sustainably over the long term.

In addition, the recent shift towards the Circular Economy (CE) concept, creates a need to examine further the linkages between waste management indicators and resource management.

Looking more generally, there has been extensive recent work to extend well-established national and international statistics on the financial flows associated with manufacturing and trade (i.e. the economy) to resource and waste flows, for example using Material Flow Accounting (MFA). MFA is now regularly practised by some member states of the EU and detailed national calculations have been available for several years for countries such as Austria, Denmark, Finland, Germany and the UK. In comparison with efforts in the EU, efforts to establish comprehensive MFA for the United States are more recent and to date less institutionalized. In the Asia-Pacific region, Australia, PRC, Japan and the Republic of Korea have been pioneers in developing an MFA system, and considerable work in the region has been done by UNEP[9,10].

For the time being, the focus of MFA is still on individual substances (e.g. cadmium flows), specific materials, or bulk material flows (e.g. steel and steel scrap flows within an economy). Using the concepts of MFA may also help in throwing some light on the present situation of transboundary movements of wastes. It is likely to take many years however for full national and international accounts that show the mass flows of both virgin and secondary raw materials, although some serious efforts are already in place.

There are very interesting approaches for developing new meaningful indicators that will link waste management with CE.

From the point of view of a company with a specific supply chain, the Ellen Mc Arthur Foundation has developed the Circularity Indicators Project, that aims to address this gap and has developed indicators that measure how well a product or company performs in the context of a circular economy, thereby allowing companies to estimate how advanced they are on their journey from linear to circular.

On a national level, CE has been widely discussed and practiced on a policy level in China.

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[9] UNEP and CSIRO (2011). *Resource Ef ciency: Economics and Outlook for Asia and the Pacific* http://apps.unep.org/publications/pmtdocuments//pdf/Resource_Ef ciency_EOAP_web.pdf

[10] UNEP and CSIRO (2013). *Recent Trends in Material Flows and Resource Productivity in Asia and the Pacific* http://www.unep.org/pdf/RecentTrendsAP(FinalFeb2013).pdf

The Chinese central government has adopted CE as a national regulatory policy priority introducing numerous regulations to support and build its implementation. China was the first country to release nationally focused Circular Economy indicators so that objective and credible information on the status of CE implementation can be recognized. These indicators are valuable metrics for policy and decision-makers and can help achieve specific goals and outcomes.

Another important effort was recently made by France[11]. According the French approach, Circular Economy is divided in three areas, namely, Supply from Economic Stakeholders, Consumer Demand and Behaviour, and Waste Management. Performance monitoring takes place at every stage of the cycle; 4 indicators are applied to the early phases (extraction/use of resources and sustainable purchasing, eco-design, industrial and territorial ecology and the functional economy), followed by two indicators for the second Action Area (responsible consumption and extension of product lifespan), and two indicators for the end of the cycle (recycling). Finally, an indicator examining employment in the circular economy naturally addresses the cycle as a whole.

There are other important efforts in place, however what is still required is to examine whether those indicator systems have actually had any significant results to government, industry, communities and other stakeholders. A clear identification of how these indicators have actually been applied and what are the experiences requires significant investigation. In any case the indicators can be used for benchmarking, improvement of environmental performance at multiple levels, identification of problem areas, cost-benefit analyses, policy direction, business investment decisions, and many other applications. But there is a need to further examine how these indicators can be integrated into methodologies for decision making and policy setting that allow for their effective implementation.

[11] MINISTRY OF THE ENVIRONMENT, ENERGY AND MARINE AFFAIRS, May 2017, 10 Key Indicators for Monitoring Circular Economy

E. Proposed Indicators

Based on the previous discussion, the following improvements are proposed.

H2020

The current indicators in use by H2020 are:

IND 1 - Municipal waste generation

IND 1.A Municipal waste composition

IND 2 - Collected and treated municipal waste

IND 2.A Number, type and location of landfills

Proposed Changes

The IND 1 needs to be improved in order to reflect better the linkages with ML. Considering the importance of plastics in ML, the following changes are proposed.

IND 1 Municipal Waste Generation stays as it is. Special emphasis should be given to:

- Plastic Waste Generation per capita
- Touristic activities, and
- Coastal Areas.

So, I suggest the following structure.

IND 1 - Municipal waste generation

IND 1.A Municipal waste composition

IND 1.B Plastic waste generation per capita

IND 1.C % of population living in Coastal Areas / Total Population

IND 1.D % of Tourists / population living in Coastal Areas

Regarding IND 2, I propose a complete restructure as follows:

IND 2 – "Hardware" of waste management

IND 2.A Waste Collection

Waste Collection Coverage: % households who have access to a reliable waste collection service.

Waste Captured by the solid waste management and recycling system: % of waste generated that is collected and delivered to an official facility.

IND 2.B Environmental Control

Controlled treatment or disposal: % of the total municipal solid waste destined for treatment or disposal which goes to either a waste treatment facility (MRF, thermal, mechanical-biological) or sanitary landfill.

IND 2.B.1 % of waste that goes to uncontrolled dumpsites

IND 2.B.2 Number of uncontrolled dumpsites in Coastal Areas

IND 2.B.3 Quantities of waste going to uncontrolled dumpsites in Coastal Areas

IND 2.C Resource Recovery

% of total municipal solid waste generated that is recycled. Includes materials recycling and organics valorisation (composting, animal feed, anaerobic digestion).

IND 2.C.1 % % of plastic solid waste generated that is recycled. Includes plastic recycled in formal and informal systems, both through source separation and MRFs.

Finally, I propose a new qualitative indicator IND 3 that will measure the "Software" of waste management in relation to ML. The indicator is described below.

IND 3 "Software" of waste management

IND 3.A Is there a National Plan for ML? (Yes or No)

IND 3.B Are there mandatory targets for source separation of plastics? (Yes or No)

IND 3.C Are there Extended Producer Responsibility obligations and schemes for plastics? (Yes or No)

IND 3.D Is there legislation to stop the use of single-use plastics? (Yes or No)

IND 3.E Is there a national plan to close the dumpsites within next 10 years? (Yes or No)

IND 3.F Is there a government budget for investments in waste management infrastructure for closing the dumpsites, reducing landfilling and promoting recycling and waste treatment? (Yes or No)

IND 3.G Is there a legal framework for the creation of waste management authorities by municipalities?

IND 3.H Are there waste management authorities in the Coastal Areas? (Yes or No)

IND 3.H Are there green procurement rules in place? (Yes or No)

IND 3.I Are there policies to support sustainable tourism? (Yes or No)

IND 3.J Are there eco-labelling and eco-design procedures? (Yes or No)

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