European Statistical Advisory Committee

# Report on the Workshop

## 'New perspectives and priorities for EU 2030 Indicators - Indicators and methodologies for describing society in the Information Age'

**8 June 2018**

**Sapienza University of Rome**
**Department of Statistical Sciences**
**Italy**

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The workshop entitled “New perspectives and priorities for EU 2030 Indicators: Indicators and methodologies for describing society in the Information Age”, organised by ESAC, Eurostat and the Department of Statistical Sciences of Rome was held the 8th of June 2018 at Sapienza University of Rome. Four sessions were organized, each one with a discussant for a total of 15 presentations. There has been the participation of more than 90 researchers coming from Italy and several other countries. This workshop followed the one organized in May 2016, and entitled ‘Indicators: user requirements, methodological issues and communication challenges’. The report of this 2016 workshop and the resulting recommendations can be found at http://ec.europa.eu/eurostat/web/european-statistical-advisory-committee-esac/other-documents.

The new workshop was motivated by the fact that our society is developing quickly, because of the constant release of new technologies and applications. The Information Age, as created by the Digital Revolution, had - and still has – an important impact on our lives. This creates challenges for the establishment and use of indicators and European statistics. We need to adapt existing indicators or create new indicators to describe and include the complexity of the phenomena giving a clear view of the reality. Technological novelties related to information collection and to ‘improving the knowledge-base’ offer new methods for the collection, dissemination and use of statistical data collections.

The extended discussion which opened up in 2009 after the "Go beyond GDP" initiatives, programmes at EU and international level, and the impetus created by the world-wide adoption in 2015 of the Sustainable Development Goals (SDGs) has clarified - in the world of statistics - that economic performances, societal and technological changes and sustainable development are complex phenomena that need an overall approach for indicators, at international, national and regional levels. At the same time, one of the 17 SDGs specifically addresses the need for multi-stakeholder partnerships to ‘Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries’.

At first, a more in-depth view is needed on what exactly is meant by these new developments in our societies in the context of the Information Age. This relates to the content and direction of the indicators and the related European statistics: What existing indicators might need a closer look? What ‘new’ issues/topics should we measure? Do we measure using appropriate analyses?

In a similar way, a more systematic description is needed on how new technologies could modernise and improve statistical production and communication and how new data sources (big data, geospatial data) could be integrated. This relates to the methodological aspects and to dissemination and communication of indicators.

So this workshop wished to identify - from the viewpoint of the users of European statistics - the priorities of new or ‘adapted’ indicators and methodologies to better describe our European societies with a time horizon up to 2030.

**Summary of the ESAC workshop**

**'New perspectives and priorities for EU 2030 Indicators**

**Indicators and methodologies for describing society in the Information Age'**

## SESSION 1 - Timely and meaningful indicators for describing and identifying new developments in our Society in the Information Age

**Chair:** Monica Pratesi
**Speakers:** John Verrinder, Giovanni Alfredo Barbieri, Ineke Stoop, Alessandro Bonara

*The session was designed to invite the participants to highlight - mainly from a users' perspective - specific topics, such as sustainable development, migration, the changing workforce, business developments and/or ecological challenges and how these would require adaptation to the content (new or adapted indicators, breakdowns) of existing European monitoring and indicator systems.*

*Attention was drawn to the new demands, opportunities, and kinds of data in the changing world. The word prosumers was introduced to describe those who are both producers and consumers of statistics.*

***Indicators sets at Eurostat*** *– John Verrinder*

New sets can be stimulated from the top down, from the bottom up, or from a mixture of the two. Key indicator sets at Eurostat could be split into three main categories:
1. Macroeconomic;
2. Social; and
3. Sustainability/environmental.

There are also others, including economics/business and cross-cutting indicators. Furthermore, there are other producers of indicators at the European level, including the Commission, the ECB, and others.

The demand for new indicator sets was outlined, covering for example 'new economies' (e.g. the gig economy) and non-traditional indicators (e.g. experimental statistics). The key question is whether existing indicator sets are fit for purpose and the perennially troublesome issue of when existing indicator sets could be dropped.

The recommendations:
- the need to respond to demand,
- to re-assess existing sets,

- to complement established sets (e.g. traditional SNA sets), and
- to adopt a process of continuing improvement of presentation of indicator sets.

***Istat's Annual Report: experimental classifications and new analyses*** – *Giovanni Alfredo Barbieri*

Experimental classifications and new analyses were presented. Experimental indicators were introduced to meet new needs and opportunities – for example, non-standard classifications, new interpretation frameworks, and big data sources.

New classifications could arise from research using microdata. Several examples were given:
- defining 'generations' in terms of epochs as historical events rather than fixed time periods (e.g. we have 'baby-boomers' and 'millennials');
- defining labour market areas for geographical classification;
- defining social groups using classification trees; and
- definitions arising from social networks. The speaker pointed out that presenting new classifications of society can often stimulate new perspectives and other research.

It is critical to make the statistics *relevant* by feeding results back to users. Indicators are useful, not (only) because they give answers but also because they raise questions.

***The three faces of immigration: the perspective of society, immigrants and the general public*** – *Ineke Stoop*

There are three faces of the hot topic of immigration:
- the perspective of society,
- immigrants, and
- the general public.

Immigration was contextualised in terms of stocks and flows, integration, discrimination, and the degree of acceptance of the receiving society. Integration could be both structural and cultural, and there were potential issues of selection bias (e.g. with people included in a population register being different from those who were not). Discrimination could be perceived or real, but both could have real impacts (e.g. with perceptions of discrimination adversely influencing quality of life). Attitudes of society towards immigrant and minority groups have been studied – with, for example, data being collected by the European Social Survey – but it was pointed out that complex issues like immigration require multiple indicators: it is not possible to summarise the multiple facets of this issue in a single dimension.

***Developing Financial statistics beyond 2020*** – *Alessandro Bonara*

The need for new measures following the financial crisis, with the European Central Bank having new responsibilities for micro and macro prudential policies, was pointed out. Significant challenges arose from the heterogeneity and complexity of the financial sector, and a number of lessons were learnt from the 2008 crisis, including the need for more

granular data, the need for timely data, and the need to understand better the interconnections between players.

In general, there had been insufficient coverage of the money markets and financial vehicle corporations. New data flows could lead to better understanding of systemic risk. The main value of financial stability indicators lays in their ability to predict severe recessions. The speaker noted that risk indicators were organised into six major classes, and that the Financial Stability Risk Indicator (FSRI) was an attempt to integrate them into a single overarching indicator.

***Issues raised during the discussion***

A lot of questions about indicators were asked. These included (but were not limited to):

- Whether there were too many to grasp;
- How to monitor them all;
- Whether all were needed;
- Whether their usefulness had been evaluated;
- Whether they were accurate;
- Whether their accuracy was continuously assessed;
- Whether there were mechanisms for eliminating redundant or unnecessary indicators;
- Whether there were mechanisms for accrediting them;
- How they should be grouped;
- What data were used;
- Data quality;
- The problem of adequately and accurately summarising 'big data';
- The problem of interpreting 'big data';
- Whether each indicator was useful for indicating the present state or predicting the future (nowcasting vs forecasting);
- Whether all indicators had adequate user manuals.

A creation of an ad hoc committee was suggested to examine such questions.

Further discussion from the floor raised other points, including:

- That terminology needs to be clarified;
- That the next financial crisis might have different causes from the last;
- That indicators could be used as management tools or as communication tools;
- The difficulty of having good indicators if one did not have good questions to start with.

**SESSION 2 - Role of new technologies and geospatial indicators in the Information Society.**

**Chair:** Tasos Christofides,
**Speakers:** David Hand, Julien Gaffuri, Lewis Dijkstra

*The objective of this session was to allow a discussion between methodologists, data producers and users of new options – created by new technologies (i.e. smart systems, Artificial Intelligence, blockchain) and applications, (i.e. LinkedIn, Facebook, e-Government, e-Health) – for better and more timely development of indicators. Special attention was given to the geographical component of European statistics[1] and its development in the Information Age.*

***Sustainability and drift of indicators based on new data sources*** *– David Hand*

The speaker recalled the opportunities created by new data sources, such as data obtained from web-scraping social media or from sensors. The new data available is generally very cheap, easily obtainable, and rather comprehensive, but requires careful assessment by the experts as it has certain characteristics that affect also the behaviour of indicators built on top. The intervention revolved around a few areas to be kept in mind when building indicators using the new data sources.

Timeliness is an important dimension to be kept in mind: indicators should adapt quickly to change, as the new data sources appear or disappear rapidly, producing different structured and unstructured content with high velocity.

At the core of the presentation, the concept of sustainability was introduced: an effect of "drift" is to be expected for the indicator values even if the root cause is not related to a change in the system being monitored. This might occur because the collection strategies need to develop to adapt to changes in the data sources or simply because they generally are not under the control of statisticians (example of "Bebo" a popular social media in the UK, very rapidly made obsolete by Facebook). Other examples of causes of drift are the changes made to definitions of concepts like recently happened for the word "dementia" or when algorithms change (like the google search), producing different dataset as output of the same queries.

A question was raised: how to deal with the indicators drift? Admittedly, that is not a problem with an easy solution. A few suggestions were mentioned:

- work with the data suppliers when possible, trying to have agreements also involving financial payments to attempt having changes controlled by service agreements;
- implement mechanisms to cope with data source failures hence ensuring stable data flows to the computation of indicators;
- ensure an adequate raw data monitoring process to measure reliability and quality; and finally;
- be prepared to follow a pattern of Prevention, Protection and Correction.

[1] http://ec.europa.eu/eurostat/web/gisco/overview

In conclusion, the new data sources create great opportunities for a more comprehensive set of statistical indicators, but the risk of poor sustainability needs to be managed, especially when creating time series.

***Geocoding and spatial modelling to geo-enable SDG indicators*** – *Julien Gaffuri*

The second presentation provided some considerations on how to geo-enable the Sustainable Development Goals (SDGs) indicators. The need for geo-located statistics and what geocoding is were explained. ("Geocoding is the linking of a value to a location"). The location could be specified explicitly, implicitly or coded. In that context the work already conducted in other disciplines could help statistics optimise the re-use of concepts and technologies. One of those disciplines is geography and the investments made in the field of Geographical Information Systems (GIS) should be kept in mind.

The right level of granularity to be considered when adopting geospatial information was debated. First of all, the statistical units should be regular in size and shape, thus the concept of grids is suggested. Secondly, intra-region disparities should not be more prominent that inter-region disparities. A view to go beyond country level granularity in statistics was conveyed, as the objective should not be to rank countries but to understand the common societal issues and better address them together. For example, statisticians should be interested in urban population exposure to air pollution by particulate matter, or distribution of population by level of difficulty in accessing public transport.

In conclusion, the importance of the spatial dimension in modern statistics was expressed. We should all encourage the collection of geocoded data and at the same time support the geocoding of administrative data sources. A strong support to involve the GIS community and the use of GIS for the SDG indicators was also articulated.

***How can geo-spatial data and remote sensing can help to measure Sustainable Development Goals*** – *Lewis Dijkstra*

The topic of spatial data and remote sensing as helping tools to measure the SDGs was introduced. Many of the SDGs have goals related to dimensions that may produce a distorted notion of the reality being measured. The dimension "city" is used to measure some statistics, but the usefulness of those indicators is impaired by the suboptimal level of spatial granularity considered. For example, when considering the amount of open air spaces, there are huge differences to be expected between the city centres compared to the periphery of a city. Maybe cities appear to be "very green" in statistical terms, but could have all the green spaces in the far periphery of a city, penalising greatly the quality of life in the city centres. Measuring the access to public transport is subject to the same problem, as differences should be expected within the perimeter identified by using the concept of city.

New opportunities are created by the advancement of technology, in particular remote sensing data combined with geo-spatial information. As an illustrative example, it was mentioned that there are various initiatives aiming to measure the distribution of green surfaces within a city, and it was suggested that indicators should make proper use of this additional information.

Somehow big parks in the centre of big city should take in a sort of premium, as this for example influences considerably the ability of reaching a green spot with a few minutes' walk during day time, in modern life. Similar considerations could be made about the access to public transport. Old indicators simply track the number of train lines in a territory. That provides only a view of the density and does not actually measure the number of people able to reach a public access point within a predefined number of minutes.

In conclusion, it was indicated that three powerful ingredients need to be used by modern statistics:

- adopt a harmonised definition of territories,
- use geospatial data, and
- make use of official data.

The use of those ingredients should be combined with new methods and geographic information system to better represent the reality through the definition of more meaningful indicators. Comparability across national boundaries is also ensured and time series could be built to show evolution of phenomena.

***Issues raised during the discussion***

During the discussion, comments stressed the opportunities and problems created by new types of data and concurred with the relevance of the quality topics arising from comparability (indicators drift). Another relevant issue in that regard was raised: the Error Propagation effect which may produce uncontrollable effects when combing data into summary indices: the issue of Modifiable Areal Unit Problem (MAUP). MAUP is relevant and there is now the possibility to address it by using regular grids and individual micro data. Comments were also made on the final presentation raising two main observations:

- the geographical support of spatial data may suffer from incompatible grid systems, with sensing data associated to grids and geo-spatial data linked to administrative partitions;
- location and measurements errors, intrinsic in the remote sensing, may negatively affect uncontrolled effects on the error propagation.

**SESSION 3 - Selection and synthesis of indicators for Sustainable Development Goals (SDGs): Innovative methodologies and applications.**

**Chair:** Ineke Stoop

**Speakers:** Walter Radermacher, Michaela Saisana, Pietro Gennari, Filomena Maggino, Maurizio Vichi

*The objective of this session was to provide a short overview of the work accomplished, and especially to present and discuss the latest ideas in the establishment of SDG indicators created by new technologies and applications.*

***Summary of the session***

At the opening of the session, the ESAC workshop on "Indicators: user requirements, methodological issues and communication challenges" held in May 2016 in Den Haag was referred to. This workshop addressed the topic of indicators in the context of EU policies and programmes, also including Sustainable Development Indicators. The full workshop report is available at http://ec.europa.eu/eurostat/web/european-statistical-advisory-committee-esac/other-documents.

It was expected that the session would provide an overview of the work accomplished so far and present and discuss new ideas in the establishment of SDG indicators[2], with a time horizon up to 2030. It was recalled that the establishment of indicators for the SDGs and related targets is fully under way everywhere. The establishment of the EU SDG indicators has made progress step by step. A first set of indicators was agreed upon last year by the European Statistical System (ESS) and released in November 2017.

From the point of view of statistics, economic performances, societal and technological changes and sustainable development are complex phenomena requesting an overall and shared approach for indicators. In addition, work on indicators for SDGs calls for multi-stakeholder partnerships. The possibilities and new options for collecting, analysing, disseminating and using statistical data enabled by new research, methodologies and technologies should be given full attention. Self-evidently, full attention is to be paid to the users of statistics.

***Sustainable development metrics – Here and today, tomorrow and elsewhere*** – *Walter Radermacher*

A comprehensive and thought provoking presentation of the determined work on sustainable development (SD) and indicators for sustainable development goals (SDGs) was given. The talk started with painting the picture from when it all started in 1980s with the Brundtland

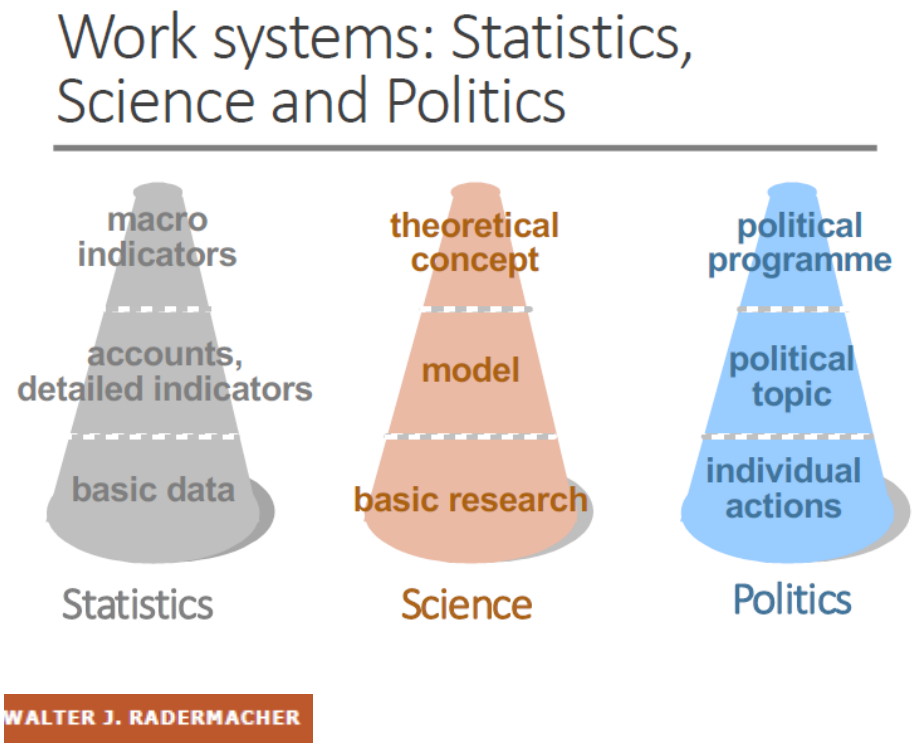
[2] For more information, see http://ec.europa.eu/eurostat/web/sdi/overview and https://sustainabledevelopment.un.org/sdgs

commission until today and further, and dealing with the 2030 goals[3] and beyond. The challenge for statisticians and researchers remains the same: create better metrics for better decision making in favour of SD. It was argued that to better support decision making in favour of SD, the metrics should:

- capture the complexity of the phenomena at stake, (resilience, risks….);
- be state of the art (multiple sources, technologies, models…);
- be of sufficient quality (coverage, timeliness, comparability across space and time);
- quality depends on use (fit for purpose in policy cycle);
- allow internalising externalities (management, valuation….).

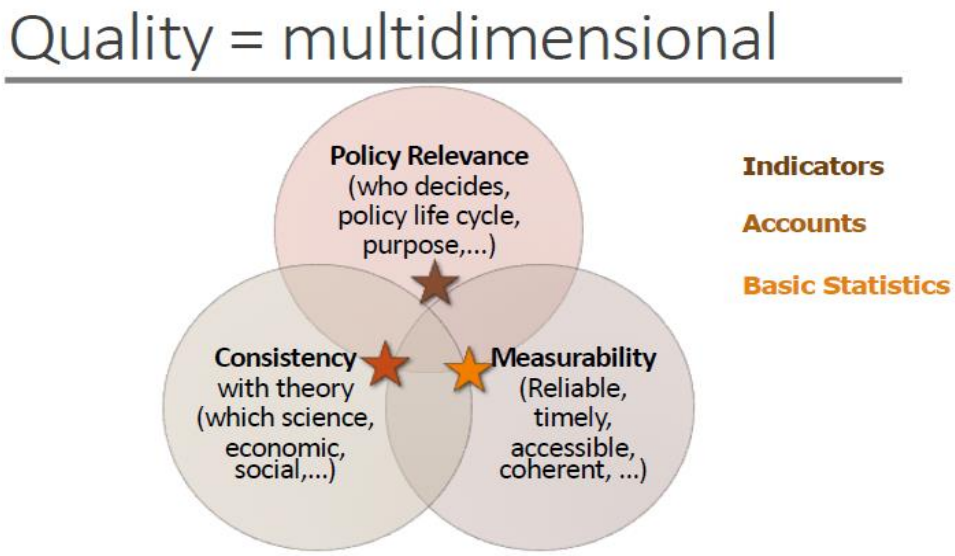
Insight to conceptual approaches and scientific disciplines contributing to metrics for SDGs was given, and science driven approaches to measure SD were summarised as follows:
• 'Keep Capital Intact!': the capital approach - stock accounting
• 'Assess the development of a country, not economic growth alone!' (e.g. HDI)
• 'Maximise Resource Productivity!': material and energy - flow accounting
• 'Operate within Planetary Boundaries!': focus on ecosystems and resilience

Due to the complexity of SD there is no unified theory of SD. The following picture demonstrating the work system we deal with in the frame of SDIs was presented:




[3] Transforming our world: the 2030 Agenda for Sustainable Development. United Nations Sustainable Development Summit, 25 September 2015. The aim is to end poverty, fight inequality and injustice, and tackle climate change by 2030.

Also, the Indicator Ecosystem Risks and quality issues were dealt with special attention to the multidimensional nature of quality and how we use indicators (NB. indicators are special types of statistical inforamtion):




WALTER J. RADERMACHER

How to reduce complexity, how to proceed from data to information, and from information to knowledge? The answer on how to proceed from data to knowledge was:

- Connect indicators with other components of the information value chain
- Facilitate scaling (zooming in and out)
- Make use of the complementarity of statistical tools (in particular accounts)
- Make use of the ordering function of indicators in the design, production and communication of statistics
- Promote indicator related research and innovation
- Promote indicator related methodological competencies with appropriate training

A short review (swot analysis) on the indicator approach was presented as a conclusion.

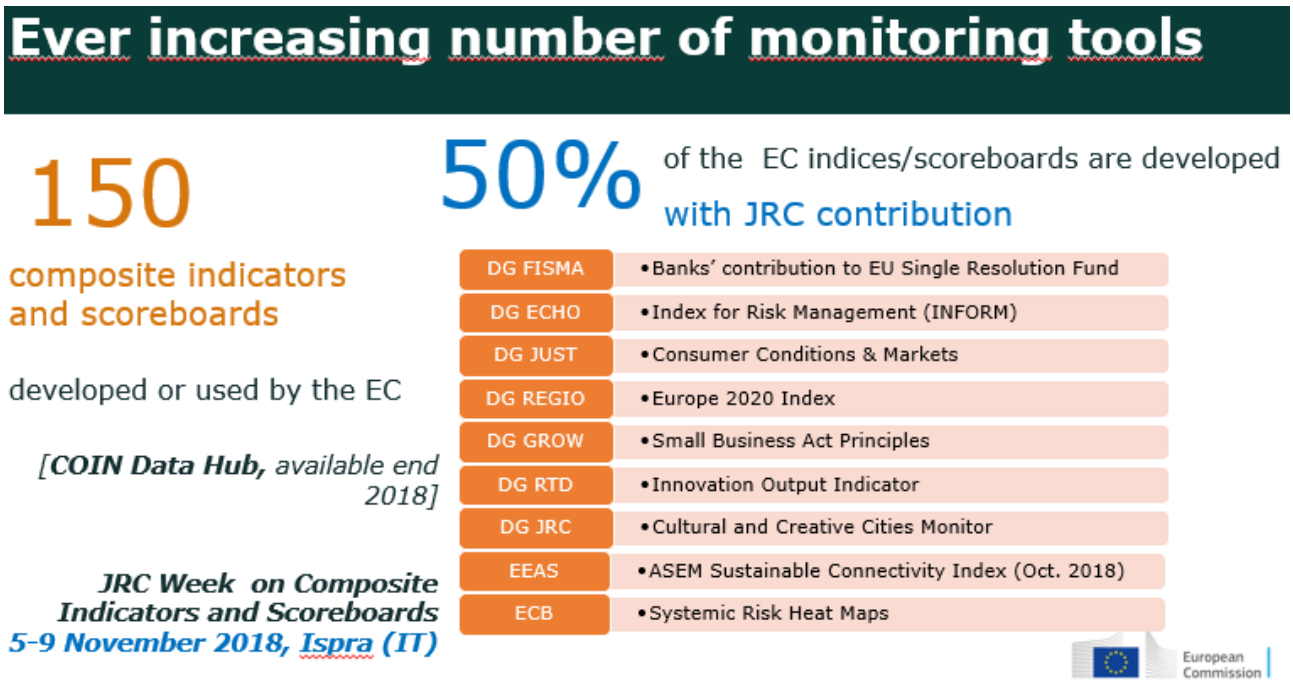
The swot-analysis (quoted below) gives food for thinking to statisticians and researchers in general, and especially to official statistics.

"**Strengths**: comprehensive, inclusive (national level), operative, motivating/activating (for developing countries), responsive (to political wishes).
**Weaknesses**: costly/slow, rigid, partial (focus on indicators), insufficient reduction of complexity, insufficient cooperation with sciences, add-on in the portfolio of statistical offices (no strategic shift), married with the nation states and their interests (global and long-term impacts underrepresented).

**Opportunities**: Strategic shift for the entire programme of official statistics (incl. data sources, communication, governance), closer cooperation with researchers (statisticians, systems/resilience, scenario and foresight, etc.) and civil society, strategic leadership on the evidence side.
**Threats**: official statistics overtaken by more agile and better connected actors, potential of official statistics not exploited, adaptability too slow, civil societies and political actors frustrated, negative feedback for reputation".

***Inspiration for the SDGs from the Social Scoreboard of the European Pillar of Social Rights*** – *Michaela Saisana*

Experiences gained at the Competence Centre on Composite Indicators and Scoreboards were shared. The number of monitoring tools is ever increasing. Only within the EU there are some 150 composite indicators and scoreboards, said the speaker (see the summary picture below):




The reason for such a big number of indicators is that member states have become more and more interdependent, which in turn requests comparative information on national and regional performance for assisting international governance. Phenomena - such as SDGs, social rights and innovation - described by scoreboards, heat maps and composite indicators are all complex.

Edward O. Wilson (1998) was quoted on Data Revolution: "We are drowning in information, while striving for wisdom. The world henceforth will be run by synthesisers, people able to put together the right information at the right time, think critically about it, and make important choices wisely."

The practices and experiences gained in the case of *the Social Scoreboard of the European Pillar of Social Rights*[4] were described. The scoreboard is composed of three dimensions and twelve areas, comprising 14 headline indicators and 21 secondary indicators, which means 93 indicators in total by age and gender. This social scoreboard is based on multi-source information embracing data from Eurostat, EU-LFS, EU-SILC, OECD, PISA, DESI, and so forth.

Thanks to interactive charts and high granularity of the scoreboard the users may ask questions and get the requested information. Time series allow for monitoring development: one may look for example on social convergence, comparing the situation in that respective country with the other member states. A heatmap allows ordering indicators to gain insight. It is also possible to apply a double re-ordering algorithm to obtain even more focused insight in the European scene[5].

As conclusion, attention was paid to one of the main characteristics of indicators and indices: they are strong and powerful tools which are to be developed sensibly and used responsibly:

> *Sensible development* of a composite indicator implies a quality control process based on both conceptual and statistical considerations.
> *Responsible use* calls for care in drawing conclusions and recommendations without taking into account the conceptual context in which composite indicators were developed.

***A dashboard to monitor agricultural sustainability -*** *Pietro Gennari*

A comprehensive report on the development work focused on indicators for monitoring SDGs in the context of FAO´s operating environment and responsibilities was given, with special emphasis on the dashboard established for monitoring agricultural sustainability.

FAO has been designated as custodian agency for 21 SDG indicators and contributing agency for additional four indicators. A lot of work and efforts have been devoted to methodological development of these indicators. Steps to develop the indicators have involved measures such as determining the scope, the sustainability dimensions to cover, selecting the themes, developing and determining the criteria for assessing sustainability performance per indicators, choosing the scale for measurement, selecting data sources or data collecting methods/instruments, and developing the reporting system of the monitoring results. A novelty of data collection is a farm survey questionnaire to be conducted every three years.

Criteria for the choice of indicators have been agreed as being: policy relevance, universality, international comparability, measurability, cost effectiveness, and minimum cross-relation. The indicators are mainly outcome indicators, though there are also behavioural indicators. Three sustainability levels are applied in assessing the sustainable development. These are: desirable (green colour), acceptable (yellow colour) and unsustainable (red colour). A

[4] https://composite-indicators.jrc.ec.europa.eu/social-scoreboard/

[5] For more information, see e.g. COIN in the EU Science Hub at https://ec.europa.eu/jrc/en/coin

dashboard is proposed as reporting system. A light pilot is to be tested in a number of selected countries. As a conclusion, a short reflection on pros & cons of the dashboard and future steps[6] were presented.

***Synthesis of indicators for Sustainable Development Goals: a systemic view*** – *Filomena Maggino, Maurizio Vichi*

Current research undertaken by Filomena Maggino, Maurizio Vichi and Carlo Cavicchia at the Sapienza University of Rome was presented. The topical research deals with synthesis of indicators for SDGs from a systemic view. The main questions raised as an outline of the presentation were: what do SDGs represent? How to define indicators? How to synthesise indicators within a system and from what perspectives? An SDGs indicators application developed in the research project was also presented and concluded with a few final remarks.

Defining indicators is a normative exercise, which means that they are measures organically connected to a conceptual model. There might be a risk in defining indicators, namely in case there would be a lack of any logical cohesion or consistency. A third premise is the complexity.

Complexity in the context of developing indicators means a set of indicators, not a single indicator. A set of indicators refers to a system of indicators. The complexity of the system of indicators may require some synthetic views through more comprehensive measures. How to obtain synthetic views? As a matter of fact any synthesis should preserve the consistency between the single elements and the synthesis.

Three different perspectives on synthesising indicators within a system were presented:

1. conceptual design;
2. theoretical definition, and
3. technical issues.

There are also various levels of a system of indicators: variables, dimensions and domains. Moreover, in synthesising indicators within a system one may distinguish two models: a reflective one (indicators are highly correlated) and a formative one (indicators not necessarily correlated). Finally, among the technical issues to tackle are, among others, weighting and aggregation techniques.

The above leads us to the following question: “what do SDGs represent?” (see the picture below, 17 SDGs)

[6] For more information, see e.g. http://www.fao.org/sustainable-development-goals/indicators/en/


Some further questions about the SDGs were raised: Do SDGs have a common conceptual framework? Do the 17 goals represent conceptual dimensions? Do the SDGs represent a system? Do the SDGs represent 17 domains?

The on-going research has revealed that some of the SDGs are domains (Life below Water, Life on Land, Industry and Infrastructure), some are conceptual issues (Gender Equality, Good Health and Wellbeing) crossing different domains, and some are goals (no Poverty, no Hunger). This situation has consequences in managing the indicators. For example, in terms of the SDGs and their synthesis, one may apply a monitoring or analysis perspective to obtain the synthesis. Monitoring is the choice for synthesising each goal, analysis is the choice for building future scenarios. The research work continues.

***Discussant´s views, observations and questions***

- Parallels to other fields in society were made;
- Would overtaking of official statistics by more agile and better connected actors mean that actually there will be a kind of market (open or less open?) of data providers?
- Conveying information through a dashboard (Social Dashboard, JRC): a lot of thinking has taken place about what makes a good dashboard delivering truthful information. Pictures (visualisations) and their design (e.g. number of dimensions captured), and choice of indicative colours (thresholds, rankings, etc.), are altogether powerful. This is to be kept in mind to communicate the content and context correctly;
- The presentation on the dashboard for monitoring agricultural sustainability highlighted in depth how a dashboard for the indicator "2.4.1 Proportion of agricultural area under productive and sustainable agriculture" may be constructed. The approach applied proved how complex such an endeavor may be and how important inter-institutional cooperation and listening to the experts are.

- A systemic view on delivering a synthesis of indicators for sustainable development (SD). The approach and application represent novelty in the field and the results presented were the very first ones based on research still going on. Next steps and further results of this topical research are expected with interest.

***Key points and issues raised in the discussion***

The need for an innovative response of statisticians and researchers to the rapid social, economic and technological changes taking place in our societies on global, EU, national, regional and local levels was clearly identified.

It was put forward that concerning SD the issue of data analysis and knowledge extraction rooted in science lies at the interface of statistical data, terminology, quality, complexity, transparency and democracy.

Activities were envisaged on *various aspects of indicators* for the SDGs. Aspects mentioned were such as statistical quality of indicators; domain or thematic indicators; indicators for policy development, monitoring and evaluation in terms of impacts; data collection on indicators; and methodological work on composite indicators, dashboards and heatmaps.

The discussion indirectly touched upon the need for future research on official statistics concerning the broad topic of understanding and monitoring SDGs, though no explicit list of research topics was suggested. This leads however to the question of a budget for research on official statistics.

The experiences from all four presentations of the session clearly highlighted that there are still issues that need to be negotiated and agreed, that there are standards to be developed and agreed, and that there is still room for improvement in the communication and interaction between producers and users of statistics and indicators.

All in all, the session convinced the audience that the 2030 Agenda for Sustainable Development is challenging the official statistics. There are clearly new demands on the production of information and knowledge. Solutions to complex problems are to be found by broad cooperation, by joining forces of academia, official statistics, and government at all levels, industries, media, education, in other words all relevant actors of society and the citizens.

**SESSION 4 - New ways of communicating indicators**

**Chair:** Asta Manninen
**Speakers:** Marko Krištof, An Nguyen, Nicola Massarelli

*The providers of official statistics are facing a challenge to efficiently attract and effectively communicate with users. The plethora of all kinds of data provided through the Internet is one of the results of the Information Age. The objective of this session was to allow producers to present new ways of communicating indicators and for users to express their experiences and needs for efficient data access and use.*

***How to make official statistics attractive****? – Marko Krištof*

In today's world, making statistics available to users is not enough. In order to stay relevant on the information market official statistics must find new ways of getting the right kind of attention to its products and releases. The presentation focused on efforts made by the Croatian Bureau of Statistics to make official statistics attractive, to promote releases that are outside focus of media attention, to get new users, and to educate new and already existing users.

The efforts started with a leadership decision to openly communicate and start using social media. Multidisciplinary teams were formed, where graphic designers, that were hired, started working with statisticians in order to produce content that is specifically adapted for social media sharing. Today almost every statistical release is followed by a graphic representation or an infographic. Interactive and tailor-made statistics are also produced, such as a name and surname search application, where each person can find out how many people in the Census were registered with a specific name. In addition, a lot of attention is drawn towards improving the statistical literacy, for example a special programme - "back 2 basics statistics" - can be mentioned. Basic statistical terms are explained through animated video clips in this programme. The Croatian Bureau of Statistics received an award from the Croatian Public Relations Association for its work in public relations in the public sector.

***Journalists as users of data and statistics: some suggestions for providers*** *– An Nguyen*

Statisticians and journalists are not two worlds apart, but perceptions of irreconcilable conflicts are mostly due to lack of mutual understanding although both aim to seek the truth about the world through rigorous verification. Differences in professional principles, priorities and methodologies can and should be minimised for an effective partnership, which is urgently needed for both society, statisticians and journalists.

Statistics are now part of the fabric of our life and will be more so in an increasingly datafied world. People need to understand numbers in context to resist the tendency to put more faith in numbers than words, be less susceptible to political and commercial manipulations of their

anxieties and hopes in order to act as informed and self-governed citizens in both public and private life. They can hardly do that without a statistically adept news media system.

In the post-truth era, the public is constantly shuttled between factual/scientific evidence and emotionally/ideologically driven socio-political movements. This manifests in not only the rise of fake news but also of what Guardian journalist, Tim Harford, labels as "statistical bullshit", i.e. "the casual slinging around of numbers not because they are true or false, but to sell a message". Such bullshit "spreads easily these days (because) all it takes is a click on social media".

Neither statistics producer or provider nor journalists can sit still and watch data losing ground quickly and disastrously to shoddy science, emotions, beliefs and ideologies. They need to work effectively and efficiently with each other to ensure that statistics reach citizens in sound, safe and engaging manners. In order for that to happen, a first important step is for scientists and statisticians to extinguish their traditional tendency to dismiss and distrust journalists and start to see them in a different professional light.

In that spirit, it might be time for statisticians and statistics providers to recognise journalists are not simply "users with a general interest" like citizens, teachers and students as ESAC (2016) defines. They should be seen as a distinctive group of users with a professional mission, who make use of use data and statistics is to mediate the relationship between the elite/powerful and lay publics for the sake of an informed and self-governed citizenry. Journalists are required not to act as mere translators but as critical scrutinisers and independent watchdog of statistics. Their main functions include not only translating complex, abstract numbers into daily life language in accurate and engaging manners but also exposing bad statistics and harnessing the power of good statistics to contextualise, background, analyse and discover news events and issues.

There is a "quantitative turn in journalism" thanks to open and transparent access to high-quality data, intuitive tools for data collection, analysis and presentation and datafication of society. But journalists need statisticians, especially independent statistics providers, to support them in finding and accessing good data, taking advantage of new data tools and technologies and overcoming traditional weaknesses in handling data.

Two main areas of journalistic weaknesses need to be addressed: (a) "naïve empiricism" (the use of the convenient tool of "he said/she said" formula on the belief that "numbers speak for themselves") and (b) the tendency to force-fit seemingly objective figures into their own preconceptions and prejudices. Some practical actions might include:

- minimising obstacles to obtain data,
- supporting daily newswork through online data resources (e.g. data visualisation tools) and quick statistical consultancy (e.g. a network of voluntary "newsroom statisticians") and
- constantly training journalists to overcome traditional weaknesses and to make the most from statistics – especially the building blocks for statistical reasoning and the ability to source, investigate, vet and evaluate the reliability and validity of data and data-based claims.

Statisticians and statistics providers were suggested to make the following attempts to improve and nurture relationships with journalists:
(a) understanding journalists and their priority (loyalty to the public, not to scientists and statisticians or any other force);
(b) placing more trust on their ability to learn and handle statistics;
(c) maintaining their interest and confidence by taking them off "number phobia" from the outset (statistics is not mathematics) and using a relatively, if not entirely, formulae-free approach to training;
(d) using both "shock" and "comfort" therapies (good and bad cases/examples right from their own news feed);
(e) co-producing with them (e.g. by means of "Newsroom statistician", residential fellowships for journalists);
(f) learning from them too (e.g. storytelling techniques); and
(g) recognising them (e.g. awards for best practices, in conjunction with professional journalism associations).

***Eurostat EU SDG monitoring package*** – *Nicola Massarelli*

The 2030 Agenda foresees to monitor progress towards the SDGs at different levels: global, regional, national and thematic. These monitoring exercises should complement each other. Eurostat monitors progress towards the SDGs in an EU context, which differs from global or national monitoring and is based on an indicator set specifically developed for that purpose.

Communication plays a central role for EU SDG monitoring. Eurostat directly interacts with its key partners and stakeholders for the definition and review of the indicator set and for the preparation of the yearly monitoring report. Eurostat is in direct contact with its main users to present the results of the monitoring exercises.

To reach a wide audience, Eurostat publishes an EU SDG monitoring package including a variety of products, showing different levels of analytical details. The package includes print publications, digital publications, a dedicated website, Wikipedia-style articles, press releases and news items on Eurostat's website. All products in the EU SDG monitoring package make large use of visual elements to facilitate communication, among which symbols to visually present the assessment of progress towards the sustainable development objectives.

In general, Eurostat makes a large use of social media (e.g. Facebook and Twitter) to communicate main findings related to statistics it publishes. It also produces videos, visualisation tools and mobile phone applications.

Eurostat also pays great attention to communicating on the quality of indicators and has defined a specific metadata template for indicators used for policy monitoring. It includes a 'quality profile', which provides an overview of the quality of an indicator at a glance.

***Issues raised during the discussion***

Modern mode of communication was discussed from the point of view producers, providers, mediators and users of statistics. New emphasis was put on cross-sectoral cooperation and even co-production. For example, producers of official statistics should be encouraged to develop their cooperation with journalists.

The ESAC paper "The role of communication in Statistical Science and the strategies of communication for statistics users" (David J. Hand and Maurizio Vichi, ESAC Doc.2018/28) is essential in discussing new ways of communicating indicators and statistics. This paper also presents recommendations.

Communicating indicators and statistics was considered a challenging task from many perspectives. When choosing the strategy and means for reaching out to various user groups it´s important to take their statistical proficiency and statistical literacy into account. For the producers and providers of statistics it is crucial to pay serious attention to content and context, because numbers do not speak for themselves. Besides easy access to statistical data the users need the statistics explained including contextual information.

In conclusion, successful communication is a precondition for raising curiosity and interest, for getting people to discuss and raise new questions, in other words for making statistics an actor for engagement and development.