Table S1. Criteria derived from interviews with the respondents (Rs).

Key Concerns and Suggestions for Inclusion in MMF 2.0	Number of Respondents	Synopsis and Example Quotations from Respondents
Uncertainty information (including the level of accuracy)	24	A great number of Rs felt that uncertainty information along with the accuracy level is vital in measuring the potential of EO to support the SDG indicators. Thus, R 3 affirmed: *"I think you should include a section about uncertainties of the data which is generated in the processing of the data. For instance, what is the uncertainties of the chlorophyll measured by satellite? The level of accuracy is depending on the method used and based on the techniques you might find a certain level of accuracy which can be compared with other sources of data, for example, in-situ measurements.* On the other hand, R 12 worried that policy makers would not present interest in this factor even though it is so important *"I think from the other side, from the people who are using sustainability development information and putting together these goals, which I suppose in the end, consultants and government agencies, they don't appreciate the levels of accuracy and uncertainty information, they would embrace the most effective cost source of data."*.
Cost-effectiveness analysis	12	Unfortunately, a cost–benefit analysis is missing in most of the peer reviewed articles; something noted by the Rs. For example, one noted *"things I've seen often in my transition from academia into looking at commercial world is that people will present at conferences and published paper, things that in reality are not feasible, and I am wondering, how would you actually do it in practice? Because somebody says it's possible to measure this with satellites, that doesn't mean that the resources or the infrastructure is feasible to do that in all places and all applications."* 12 respondents felt that a cost-effectiveness analysis would be important and should be included. For instance, R 13 reckons: *There is a big misconception that EO satellite data especially that VHR is expensive. I think that's a fake barrier. And people are always surprised when I say, well, the highest resolution satellite imagery is cheaper than archived aerial photography or drones……Lack of understanding, lack of knowledge, that is the problem."*
Practicability and maturity of the approach/ method	5	Several respondents suggested to take into consideration the practicability and maturity of any methods used. R 24 said: *"I would look at the technological readiness level (TRL) developed by NASA which is applicable mostly on the satellite mapping technology, so whether the satellite mapping is*

		fully operational, or more experimental. But this can be adapted and applied on the practicability of the approach."
Directness	18	Many Rs (18 out of 38) considered that the indicators of the SDGs would get support from the EO data, either through a direct or indirect way. R 22 confirmed: *"Well from my own point of view there are two different ways. So, things like land cover, land change, water quality, those sorts of applications, you should only really get from earth observation and remote sensing data directly and independently. However, remote sensing data drive statistical analysis as well. On the other hand, satellite data obviously can be used through an indirect way, especially for socio economic indicators, there are EO applications such as mining activity, monitoring containers pots from high resolution, which has commercial application, people which are interested in global trade (monitoring containers- using VHR). These are not straightforward methods in order to support the indicators directly. And actually, it is a very difficult way. In terms of land use and land change cover, of course we have social economic dimensions are interacting with this."* R 12: *"You know the environmental observation are quite advanced and you can see from space the environmental changes. And is done for ocean, air and land. However, socio economic indicators, if it's something like sanitation, you are not going to be able to measure sanitation directly from space. You could possibly measure from space bore holes there are. You might be able to identify boreholes with very high-resolution imagery. We might be able to identify a site toilet. you may be able to have secondary indicators that help you determine whether these things are changing. You might not have something to directly measure but to measure of sanitation state would help to understand whether things are getting better or improving or changing."*
Requirement for non-EO information (Validation of using Premise 1.2. MMF 1.0)	14	A great number of Rs made a clear agreement upon the Premise 1.2 [29]. This premise represents the need of EO data to be supplemented by non-EO information to a certain extent.
Completeness (Validation of Premise 2 MMF 1.0)	15	Many participants agreed with the assumptions taken on Premise 2 [29] which refers to the level of EO data required to fully calibrate the indicator.
Scalability	11	When respondents mentioned scalability during the interview, they referred to two distinct aspects: 1. Transferability of the approach to a different location and scale (e.g., from local to global) (see also R comments for *Methods of processing data*) 2. The cost of EO data involved when VHR is used to a large scale (see also Key response for Cost-effectiveness analysis)

Spatial resolution	20	Temporal and spatial resolution have also been mentioned by a great number of key informants and they recognised that certain resolutions can be used for irrefutable applications whereas VHR data can play a role in validation for a very local targeted scale. Hence R 25 highlighted: "*The importance of revisit time and spatial resolution will depend on what are you trying to measure. So, having higher temporal collection is important, and the spatial resolution as well, as it allows the ability to see things that you are interested. I think where the VHR imagery is very interesting is that it can detect certain things that the coarse resolution cannot detect. And I was surprised by Foody in his fascinating talk about slavery, where they use this machine learning technique to identify brick and you can identify particular types of human activity in the landscape if it's got a typical pattern.*"
Revisit time - Regularity and consistency EO data availability in the near real time	20	Same example as spatial resolution
Validation (e.g., measurements in situ, using VHR data)	5	A view came from R 30 who emphasised the importance of the validation: "*the transparency of the approach comes only when a validation has been performed……the source of data for validation can differ depending on the application, we cannot only rely on VHR data……. Nevertheless, validation is fundamental regardless the method used…*" A more straightforward point came from R 23 who believed that: "*I think the illusion is that we reckon that we have perfect data gathering or get perfect data interpretation, validation. None of these things are true. We do not have perfect data gathering. We don't have perfect data assessment, verification or validation. These are all imperfect arts, this is where we need to be very careful with the use of the word indicators. The indicator gives us a sense of meaning. It doesn't tell us the truth, but if we have multiple data sources from multiple directions with multiple interpretations and they all inflect a meaning of common substance, then we can start to say that maybe this is giving us some insights which we can then work with.*"
Publication details (grey/white literature)	12	12 respondents suggested including details about whether the approach offered is published in a peer-reviewed journal or in another type of report. We have considered that a peer reviewed article represents a gold standard by which the quality of the research or proposal for demonstrating the viability of using EO data for SDG indicators can be judged. In terms of the grey literature, we have taken into consideration the recognized reputation of the organisation/institution releasing that particular case study. Therefore, a view came from R 13 who stated: "*The grey literature is not peer reviewed and therefore believe me, I have contempt for*

			the peer review system, but is the best at present that we have. So yes, I think you have to treat it separately as a separate source of information to the Peer Review Journal articles. You have to distinguish clearly peer reviewed articles from professional reports, consultancy agency, unrefereed journal reports and other media reports relating to blogs and other stuff."
Indicator assessment (TIERS)		2	It has also been mentioned that it is important to consider the TIERs (I, II, III) of the SDG indicators in order to understand whether EO data could help monitor especially those indicators classified in TIER II and III.
Methods of processing data: Premise 1.1 MMF 1.00 - should not be scalable		22	Many of the Rs believed that Premise 1.1 Methods of processing data (MMF 1.0) should not be scalable, mostly because of the EO application and the strong relation between the level of transferability of the algorithm developed from one location to a different one. As R 1 stated *"If the metrics used for one region cannot be applied on a different region then a proxy metric can be used so you can adjust or tailored the metric according to that area requirements, but a scoring system would not be impossible unless you develop 232 frameworks."* This implies different levels of accuracies released from the algorithm used on the specific application. Moreover, R 2 said *"All the methods depend on the applications. It is difficult to assign an absolute score for individual methods, because it depends on the applications. Same on the optical and radar data. For example, if you look at the segmentation of an urban area and segmentation of the forest/ land, the level of errors would be completely different."*

Table S2. Comparison between MMF 1.0 and MMF 2.0 Dashboards: Number of SDG indicators by category of support from EO data.

MMF 1.0 Dashboard				MMF 2.0 Dashboard			
MMS = 1–4 (weak contribution from EO data)	MMS = 4–7 (indirect measure of EO data)	MMS = 7–10 (direct measure of EO data)	MMS = 0 (no present evidence in the literature)	MMS = 1–2 (weak contribution from EO data)	MMS = 2–4 (partial contribution from EO data)	MMS = 4–5 (direct measure of EO data)	MMS = 0 (no present evidence in the literature)
22	39	23	148	25	40	15	152
Total indicators with support from EO data = 84				Total indicators with support from EO data = 80 indicators			

Table S3. Reasons for changes between MMF 1.0 and MMF 2.0 dashboards.

Reasons for Change/No Change	SDG Indicator	Example of Publication

Indicators' colour changed due to the new premises	16.5.1 Proportion of persons who had at least one contact with a public official and who paid a bribe to a public official, or were asked for a bribe by those public officials, during the previous 12 months	[27] proposed a measure of regional favouritism using night-time satellite data intensity when measured before and after elections. When we reassessed this approach against the upgraded MMF 2.0 framework, we obtained an MMS of 1.66 for these 2 indicators mostly because of the robust criteria imposed by its premises. This resulted in the colour change from amber to red for the EO data contribution for these two indicators.
Indicators' colour has not changed but a more rigorous literature is available	14.6.1 Progress by countries in the degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing	Global Fishing Watch [44] is committed to providing an interactive platform where the key dataset is vessel detection and tracking data using NOAA's VIIRs satellite, Automatic Identification Systems (AIS) and Vessel Monitoring Systems (VMS), thus, it provides vessels activities integrated into an interactive platform. Using machine learning, they could also detect patterns in the data, and then identify specific behaviours that indicate possible illegal activities. Using such information can help FAO to determine which regions may be at risk of overfishing worldwide, hence, which countries do not conform with regulations. The occurrence of illegal fishing could be a reflection of the countries' progress in terms of combating illegal fishing. Taking into consideration the robustness, completeness and practicability of this programme, we chose this instead of the previous approach presented in [45].
New indicators released due to new publications	11.7.1 Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities	The contribution of EO data to monitor this indicator is based on urban monitoring and change detection, including green and public spaces. For instance, the German Federal Agency for Cartography and Geodesy calculates 11.7.1 for built up area and open space using data from the German land cover model, Imperviousness-High Resolution Layer (HRL), and Sentinel 2 [46].

MMF 1.0 DASHBOARD

1. NO POVERTY												2. ZERO HUNGER										
1.1	1.2		1.3	1.4		1.5			1.a			1.b	2.1		2.2		2.3		2.4	2.5		2.a	2.b	2.c
1.1.1	1.2.2	1.2.2	1.3.1	1.4.1	1.4.2	1.5.1	1.5.2	1.5.3	1.a.1	1.a.2	1.a.3	1.b	2.1.1	2.1.2	2.2.1	2.2.2	2.3.1	2.3.2	2.4.1	2.5.1	2.5.2	2.a.1	2.a.2	2.b.1	2.c.1

3. GOOD HEALTH AND WELL-BEING																							
3.1		3.2		3.3					3.4		3.5		3.6	3.7			3.8		3.9			3.a	3.b	3.c	3.d
3.1.1	3.1.2	3.2.1	3.2.2	3.3.1	3.3.2	3.3.3	3.3.4	3.3.5	3.4.1	3.4.2	3.5.1	3.5.2	3.6.1	3.7.1	3.7.2	3.8.1	3.8.2	3.9.1	3.9.2	3.9.3	3.a.1	3.b.1	3.b.2	3.c.1	3.d.1

4. QUALITY EDUCATION											5. GENDER EQUALITY											
4.1	4.2		4.3	4.4	4.5	4.6	4.7	4.a	4.b	4.c	5.1	5.2		5.3		5.4	5.5		5.6		5.a		5.b	5.c
4.1.1	4.2.1	4.2.2	4.3.1	4.4.1	4.5.1	4.6.1	4.7.1	4.a.1	4.b.1	4.c.1	5.1.1	5.2.1	5.2.2	5.3.1	5.3.2	5.4.1	5.5.1	5.5.2	5.6.1.	5.6.2	5.a.1	5.a.2	5.b.1	5.c.1

6. CLEAN WATER & SANITATION										7. AFFORTABLE & CLEAN ENERGY					8. DECENT WORK & ECONOMIC GROWTH							
6.1	6.2	6.3		6.4		6.5		6.6	6.a	6.b	7.1		7.2	7.3	7.a	7.b	8.1	8.2	8.3	8.4		8.5		8.6	8.7
6.1.1	6.2.1	6.3.1	6.3.2	6.4.1	6.4.2	6.5.1	6.5.2	6.6.1	6.a.1	6.b.1	7.1.1	7.1.2	7.2.1	7.3.1	7.a.1	7.b.1	8.1.1	8.2.1	8.3.1	8.4.1	8.4.2	8.5.1	8.5.2	8.6.1	8.7.1

8. DECENT WORK & ECONOMIC GROWTH (contd.)								9. INDUSTRY, INNOVATION & INFRASTRUCTURE											10. REDUCED INEQUALITIES			
8.8		8.9		8.10		8.a	8.b	9.1		9.2		9.3		9.4	9.5		9.a	9.b	9.c	10.1	10.2	10.3	10.4	10.5	10.6
8.8.1	8.8.2	8.9.1	8.9.2	8.10.1	8.10.2	8.a.1	8.b.1	9.1.1	9.1.2.	9.2.1	9.2.2	9.3.1	9.3.2	9.4.1	9.5.1	9.5.2	9.a.1	9.b.1	9.c.1	10.1.1	10.2.1	10.3.1	10.4.1	10.5.1	10.6.1

10. REDUCED INEQUALITIES (contd.)				11. SUSTAINABLE CITIES & COMMUNITIES														12. RESPONSIBLE CONSUMTION & PROD[N]			
10.7		10.a	10.b	10.c	11.1	11.2	11.3		11.4	11.5		11.6		11.7		11.a	11.b		11.c	12.1	12.2		12.3	12.4	
10.7.1	10.7.2	10.a.1	10.b.1	10.c.1	11.1.1	11.2.1	11.3.1	11.3.2	11.4.1	11.5.1	11.5.2	11.6.1	11.6.2	11.7.1	11.7.2	11.a.1	11.b.1	11.b.2	11.c.1	12.1.1	12.2.1	12.2.2	12.3.1	12.4.1	12.4.2

12. RESPONSIBLE CONSUMPTION & PROD[N] (contd.)							13. CLIMATE ACTION						14. LIFE BELOW WATER									
12.5	12.6	12.7	12.8	12.a	12.b	12.c	13.1	13.2	13.3		13.a	13.b	14.1		14.2	14.3	14.4	14.5	14.6	14.7	14.a	14.b	14.c
12.5.1	12.6.1	12.7.1	12.8.1	12.a.1	12.b.1	12.c.1	13.1.1	13.1.2	13.2.1	13.3.1	13.3.2	13.a.1	13.b.1	14.1.1 (a)	14.1.1 (b)	14.2.1	14.3.1	14.4.1	14.5.1	14.6.1	14.7.1	14.a.1	14.b.1	14.c.1

15.LIFE ON LAND															16. PEACE, JUSTICE & STRONG INSTITUTIONS								
15.1		15.2	15.3	15.4		15.5	15.6	15.7	15.8	15.9	15.a	15.b.	15.c	16.1				16.2			16.3		16.4	
15.1.1	15.1.2	15.2.1	15.3.1	15.4.1	15.4.2	15.5.1	15.6.1	15.7.1	15.8.1	15.9.1	15.a.1	15.b.1	15.c.1	16.1.1	16.1.2	16.1.3	16.1.4	16.2.1	16.2.2	16.2.3	16.3.1	16.3.2	16.4.1	16.4.2

16. PEACE, JUSTICE & STRONG INSTITUTIONS (contd.)													17. PARTENERSHIPS FOR THE GOALS										
16.5		16.6		16.7		16.8	16.9	16.10		16.a	16.b	17.1		17.2	17.3		17.4	17.5	17.6		17.7	17.8	17.9	17.10	17.11
16.5.1	16.5.2	16.6.1	16.6.2	16.7.1	16.7.2	16.8.1	16.9.1	16.10.1	16.10.2	16.a.1	16.b.1	17.1.1	17.1.2	17.2.1	17.3.1	17.3.2	17.4.1	17.5.1	17.6.1	17.6.2	17.7.1	17.8.1	17.9.1	17.10.1	17.11.1

17. PARTENERSHIPS FOR THE GOALS (contd.)									
17.12	17.13	17.14	17.15	17.16	17.17	17.18			17.19	
17.12.1	17.13.1	17.14.1	17.15.1	17.16.1	17.17.1	17.18.1	17.18.2	17.18.3	17.19.1	17.19.2

EO satellite data contribution to support SDG Indicators

- 🟩 Direct contribution of EO data
- 🟨 Partial contribution of EO data
- 🟥 Weak contribution from EO data
- ⬜ No present evidence in the literature

MMF 2.0 DASHBOARD

1. NO POVERTY | 2. ZERO HUNGER

1.1	1.2		1.3	1.4		1.5				1.a		1.b	2.1		2.2		2.3		2.4	2.5		2.a		2.b	2.c
1.1.1	1.2.2	1.2.2	1.3.1	1.4.1	1.4.2	1.5.1	1.5.2	1.5.3	1.5.4.	1.a.1	1.a.2	1.b.1	2.1.1	2.1.2	2.2.1	2.2.2	2.3.1	2.3.2	2.4.1	2.5.1	2.5.2	2.a.1	2.a.2	2.b.1	2.c.1

3. GOOD HEALTH AND WELL-BEING

3.1		3.2		3.3				3.4		3.5		3.6	3.7		3.8		3.9			3.a	3.b	3.c	3.d
3.1.1	3.1.2	3.2.1	3.2.2	3.3.1	3.3.2	3.3.3	3.3.4	3.3.5	3.4.1	3.4.2	3.5.1	3.5.2	3.6.1	3.7.1	3.7.2	3.8.1	3.8.2	3.9.1	3.9.2	3.9.3	3.a.1	3.b.1	3.b.2	3.c.1	3.d.1

4. QUALITY EDUCATION | 5. GENDER EQUALITY

4.1	4.2		4.3	4.4	4.5	4.6	4.7	4.a	4.b	4.c	5.1	5.2		5.3		5.4	5.5		5.6		5.a	5.b	5.c
4.1.1	4.2.1	4.2.2	4.3.1	4.4.1	4.5.1	4.6.1	4.7.1	4.a.1	4.b.1	4.c.1	5.1.1	5.2.1	5.2.2	5.3.1	5.3.2	5.4.1	5.5.1	5.5.2	5.6.1.	5.6.2	5.a.1	5.a.2	5.b.1	5.c.1

6. CLEAN WATER & SANITATION | 7. AFFORTABLE & CLEAN ENERGY | 8. DECENT WORK & ECONOMIC GROWTH

6.1	6.2	6.3		6.4		6.5		6.6	6.a	6.b	7.1		7.2	7.3	7.a	7.b	8.1	8.2	8.3	8.4		8.5		8.6	8.7
6.1.1	6.2.1	6.3.1	6.3.2	6.4.1	6.4.2	6.5.1	6.5.2	6.6.1	6.a.1	6.b.1	7.1.1	7.1.2	7.2.1	7.3.1	7.a.1	7.b.1	8.1.1	8.2.1	8.3.1	8.4.1	8.4.2	8.5.1	8.5.2	8.6.1	8.7.1

8. DECENT WORK & ECONOMIC GROWTH (contd.) | 9. INDUSTRY, INNOVATION & INFRASTRUCTURE | 10. REDUCED INEQUALITIES

8.8		8.9		8.10		8.a	8.b	9.1		9.2		9.3		9.4	9.5		9.a	9.b	9.c	10.1	10.2	10.3	10.4	10.5	10.6
8.8.1	8.8.2	8.9.1	8.9.2	8.10.1	8.10.2	8.a.1	8.b.1	9.1.1	9.1.2	9.2.1	9.2.2	9.3.1	9.3.2	9.4.1	9.5.1	9.5.2	9.a.1	9.b.1	9.c.1	10.1.1	10.2.1	10.3.1	10.4.1	10.5.1	10.6.1

10. REDUCED INEQUALITIES (contd.) | 11. SUSTAINABLE CITIES & COMMUNITIES | 12. RESPONSIBLE CONSUMTION & PRODⁿ

10.7		10.a	10.b	10.c	11.1	11.2	11.3		11.4	11.5		11.6		11.7		11.a	11.b		11.c	12.1	12.2		12.3	12.4
10.7.1	10.7.2	10.a.1	10.b.1	10.c.1	11.1.1	11.2.1	11.3.1	11.3.2	11.4.1	11.5.1	11.5.2	11.6.1	11.6.2	11.7.1	11.7.2	11.a.1	11.b.1	11.b.2	11.c.1	12.1.1	12.2.1	12.2.2	12.3.1	12.4.1	12.4.2

12. RESPONSIBLE CONSUMTION & PRODⁿ (contd.) | 13. CLIMATE ACTION | 14. LIFE BELOW WATER

12.5	12.6	12.7	12.8	12.a	12.b	12.c	13.1	13.2	13.3		13.a	13.b	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.a	14.b	14.c
12.5.1	12.6.1	12.7.1	12.8.1	12.a.1	12.b.1	12.c.1	13.1.1	13.1.2	13.2.1	13.3.1	13.3.2	13.a.1	13.b.1	14.1.1 (a) 14.1.1 (b)	14.2.1	14.3.1	14.4.1	14.5.1	14.6.1	14.7.1	14.a.1	14.b.1	14.c.1

15. LIFE ON LAND | 16. PEACE, JUSTICE & STRONG INSTITUTIONS

15.1		15.2	15.3	15.4		15.5	15.6	15.7	15.8	15.9	15.a	15.b.	15.c	16.1				16.2			16.3		16.4	
15.1.1	15.1.2	15.2.1	15.3.1	15.4.1	15.4.2	15.5.1	15.6.1	15.7.1	15.8.1	15.9.1	15.a.1	15.b.1	15.c.1	16.1.1	16.1.2	16.1.3	16.1.4	16.2.1	16.2.2	16.2.3	16.3.1	16.3.2	16.4.1	16.4.2

16. PEACE, JUSTICE & STRONG INSTITUTIONS (contd.) | 17. PARTENERSHIPS FOR THE GOALS

16.5		16.6		16.7		16.8	16.9	16.10		16.a	16.b	17.1		17.2	17.3		17.4	17.5	17.6		17.7	17.8	17.9	17.10	17.11
16.5.1	16.5.2	16.6.1	16.6.2	16.7.1	16.7.2	16.8.1	16.9.1	16.10.1	16.10.2	16.a.1	16.b.1	17.1.1	17.1.2	17.2.1	17.3.1	17.3.2	17.4.1	17.5.1	17.6.1	17.6.2	17.7.1	17.8.1	17.9.1	17.10.1	17.11.1

17. PARTENERSHIPS FOR THE GOALS (contd.)

17.12	17.13	17.14	17.15	17.16	17.17	17.18			17.19	
17.12.1	17.13.1	17.14.1	17.15.1	17.16.1	17.17.1	17.18.1	17.18.2	17.18.3	17.19.1	17.19.2

Figure S1. Comparison of MMF 1.0 and MMF 2.0 dashboards.