

# Geosphere Infrastructures for Questions into Integrated Research



## **D7.3 Harmonized KPI system for TA services**



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## Versions

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## 1 Introduction

The present deliverable is part of a set of two deliverables, D7.2 and D7.3, reporting on a harmonized Key Performance Indicators (KPI) system for Virtual Access (VA, D7.2) and Transnational Access (TA, D7.3).

Physically accessing a facility, observatory or other RI sites can correspond to different type of activity. It could range from experiments to dedicated non-intrusive observations or tests. To some extent, simulations, modelling and VA can be associated by supporting the TA objectives, but they will not be treated here. Access to physical equipment are generally labelled Transnational Access (TA) in Ris. However, the two notions are different. TA refers to a specific type of physical access that are granted to users from a different country and can be specifically funded under different European funding schemes. Nevertheless RIs, even in TA projects, are very frequently facing national or even internal accesses. There are no significant differences in terms of KPIs management and in the present document we will consider all physical access when speaking of TAs.

Similarly to what was observed in D7.2, TA KPIs are very dependent on the RI sites and activity heterogeneity. The majority of them should be adapted and the need to reach agreements on harmonizing the practice and definition is of uttermost importance.

ESFRI is aware of these challenges and differences, as demonstrated in the ESFRI working Group Report on the Monitoring of Research Infrastructures performance (2019, [https://www.esfri.eu/sites/default/files/ESFRI\\_WG\\_Monitoring\\_Report.pdf](https://www.esfri.eu/sites/default/files/ESFRI_WG_Monitoring_Report.pdf)). The executing summary states, as part of their key recommendations, that *“Given the diversity of RIs, their objectives and state of development and the varying relevance of specific KPIs for each RI, the KPIs are not suitable for a comparison of the performance of RIs”*. The same report recommends that *“the KPIs to be used by each RI are determined in a dialogue between the RI and ESFRI”*. The very first recommendation starts with: *“All KPIs should be aligned with the objectives of RIs and fulfil RACER criteria: Relevant, Accepted, Credible, Easy to monitor, Robust. ...”*. Geo-INQUIRE aligns fully with these recommendations, as shall be seen below.

Through the involvement of EPOS, ECCSEL and EMSO, through the interaction with the ARISE infrasound community and through the Center of Excellence ChEES, Geo-INQUIRE provides a unique opportunity of knowledge, strategy and technology sharing on KPIs between distributed RIs (Research Infrastructures) in Europe. Geo-INQUIRE’s internal KPIs for project monitoring were therefore aligned as much as possible with RI needs so that the internal project monitoring served as a practical feasibility test for future harmonisation between the involved RIs. The deliverable is intended as a shared and approved document with these RIs, for future use past the end of the project. It is also aimed to providing practical tests of KPI collection strategies, aligned with the findings by the ESFRI working group which states that *“Specific methods or tools to gather the data will need to be developed or agreed by RIs to be able to reliably report on some of the proposed indicators. The WG recommends that ESFRI facilitates such a development.”*



The deliverable is organised as follows: In Section 2, we present the different types of KPIs that cover TA activities. We then, in Section 3, explain the methodology that was employed to select the TA KPIs and we provide a description. Feedback and lessons learnt from the first assessments are then presented in Section 4. Finally, in Section 5, we present the method to harmonize long-term with the TA RIs involved in Geo-INQUIRE and present future steps to be taken with them.

## 2 Diversity of KPI needs for Geo-INQUIRE KPIs

### 2.1 TA KPI diversity in RIs

KPIs can be classified accordingly to different perspectives. The main reason being that indication of performance could largely vary depending of the target you elect to be assessed in terms of performance.

Namely, here are represented some of the main targets generally treated in RIs:

- activity type (virtual access, physical access, remote access, training...)
- data management (FAIRness, storage...)
- impact (publication, citation, patent...)
- organisational or structural processes (coordination, communication, security...)
- services provision and user experience (in terms of satisfaction, fulfilment of user demands and needs)
- improvement

One important consideration here is that those KPIs domains are generally overlapping in lots of areas. For instance, data management could be considered as part of the organisational processes, similarly the improvements KPIs can cover all the previous sections.

KPIs dedicated to TA can be encountered in all those domains. Nevertheless, they can be more conveniently arranged by mainly focussing on the different phases that constitute the physical access and its framework:

- KPIs regarding the way the **access call and proposal** validation were launched and implemented. This might also include initial interviews and exchanges between the facility owner and the potential users.
- KPIs dedicated to the **physical access**. They cover numerous fields: security, information, technical and administrative support, working conditions...
- KPIs dedicated to the **data management** associated to the TA (storage services, FAIRness, privacy and ownership handling...)
- KPIs dedicated to the **impact of the results** that were yield during the TA (patent, publication, citation...)

It is also important to notice the duality that needs to be considered in all those processes: the TA performance can be felt and assessed differently by both service providers and users. Namely the



user will be asked to evaluate the quality of the TA services that were provided to him while facility owners will describe how they have experienced the service provision. In the end both contributions will provide a comprehensive view of the strength and weaknesses to consider in the implementation of TAs.

## 2.2 Geo-INQUIRE use of KPIs

Geo-INQUIRE architecture is divided into different WP activities to engage the project objectives. WP2 to WP5 and WP8 manage services and activities carried out by installations (i.e. local sub-components of the RIs) in opposition to WP 6, 7 and 9 that are respectively targeting services, tools and products (WP6), data management and impact (WP7) and training/cross-disciplinary research (WP9) at the RI level.

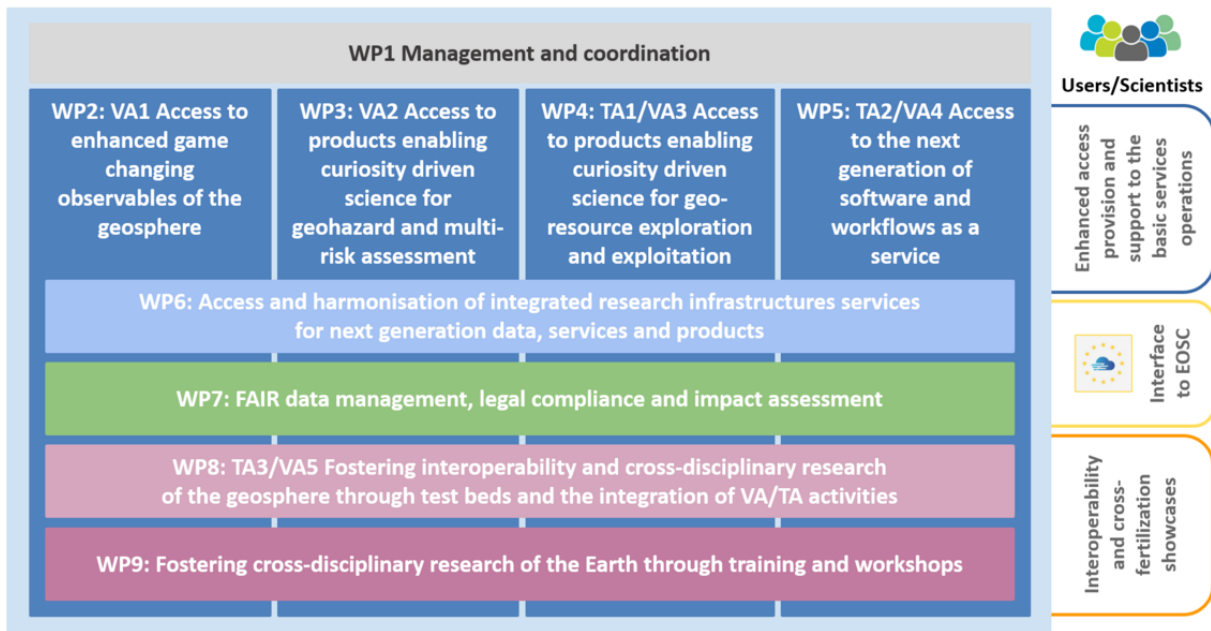


Figure 1: Geo-INQUIRE WP 1 to 9 descriptions

Geo-INQUIRE focuses on two main objectives: harmonizing KPI definitions and collecting KPI data across RIs. The primary aim is the long-term KPI harmonization for the RIs. As described in D.7.2, Geo-INQUIRE uses three different KPIs sets:

- The first set relates to the internal monitoring of the project. The project monitors its progress through KPIs that track service integration, data access, service usage, and training, using a limited set of KPIs for consistency across activities. These KPIs are analysed internally at WP or project levels.
- The second set is dedicated to monitor RIs activities in terms of services provision and impact within the project period. Those KPIs were selected and tested inside the project to provide assessments of their applicability and other RACER criteria in the scope RI KPI harmonization.

- The third set is derived from the second one, but it focuses on long term KPIs approach for harmonization that will be proposed to the RIs communities beyond the project end.

The first KPI set as well as KPIs dedicated to training or matters not closely related to TA services provision and impact will not be treated here.

Services provision and impact KPIs, important for TA, are used by funding agencies to assess RI performance. ESFRI has already proposed a harmonized approach to KPIs in 2019, aiming to create a common framework for monitoring performance across RIs. These KPIs, while adaptable, must consider the diversity of RIs and the RACER criteria (Relevant, Acceptable, Credible, Easy and Robust). The document highlights relevant KPIs for Transnational Access and discusses their implementation challenges.

Objective	KPIs
<b>Enabling scientific excellence</b>	1. Number of user requests for access
	2. Number of users served (S)
	3. Number of publications (I)
	4. Percentage of top (10%) cited publications (I)
<b>Delivery of education and training</b>	5. Number of master and PhD students using the RI
	6. Training of people who are not RI staff
<b>Enhancing collaboration in Europe</b>	7. Number of members of the RI from ESFRI countries
	8. Share of users and publications per ESFRI member country (I)
<b>Facilitating economic activities</b>	9. Share of users associated with industry and publications with industry (I)
	10. Income from commercial activities and the number of entities paying for service
<b>Outreach to the public</b>	11. Engagement achieved by direct contact
	12. Outreach through media
	13. Outreach via the RI's own web and social media
<b>Optimising data use</b>	14. Number of publicly available data sets used externally (S)
<b>Provision of scientific advice</b>	15. Participation by RIs in policy related activities
	16. Citations in policy related publications (I)
<b>Facilitating international co-operation</b>	17. Share of users and publications per non-ESFRI member country (I)
	18. International trainees
	19. Number of members of the RI from non-ESFRI countries



<b>Optimising management</b>	20. Revenues (S) Note: Sources of revenue and their respective contributions to investments and operational cost (ESFRI definition).
	21. Extent of resources made available (S) Note: Experimental time available or size of resources database made available to users to facilitate research (ESFRI definition).

Table 1. Proposed numerical KPIs for ESFRI Landmarks. KPIs relevant for TA are highlighted in grey. Their affiliation to services (S) and/or Impact (I) is specified.  
([https://www.esfri.eu/sites/default/files/ESFRI\\_WG\\_Monitoring\\_Report.pdf](https://www.esfri.eu/sites/default/files/ESFRI_WG_Monitoring_Report.pdf))

### Challenges regarding the services provision and impact in TA KPIs:

Some of the KPIs cannot be clearly interpreted and even more compared between different facilities. For instance, the number of users served (N°2) corresponds to the annual number of granted proposals/accepted users (in TA scope). Indeed, prefacing the access, the candidate users submit a proposal to one RI which will be evaluated and either accepted or rejected. The rationale behind that KPI describes an indicator to measure the size of the community served. However, some discrepancy arises from the lack of precision regarding the users count. In some RI the user could be considered as an entity that is related to the submitted proposal. Then you will have 1 user considered even if the facility is truly accessed by several researchers. Similarly, the physical access is not defined and clearly established among RIs. They might have very different durations (one day up to several months) and they can also be non-continuous. Finally, some access can be granted to the same people several times in one year leading to a confusion in determining if they should be accounted repeatedly. Depending on the chosen method those uncertainties can yield very large variations between two identical set-ups. Another good example corresponds to the data set description that is not universally shared. This concern was already raised in D.7.2 regarding VA KPI.

While there is, in VA KPI and to some extent, an overlap between data/metadata access and service provision, this not the case for TA access. Physical access is more diverse and related to personal experience. They encompass different and complex interactions. For instance, the user-service provider communication, the working conditions and assistance during the access are fundamental to characterize the service completion and yet not covered by the proposed KPIs.

## 3 Methodology to establish Geo-INQUIRE TA KPIs

The TA KPIs in Geo-INQUIRE were defined through an iterative process led by WP7, combining a top-down approach via the Project Management Board (PMB) and a bottom-up approach with feedback from WP2-WP5 and WP8 and technical constraints, along with discussions with WP6 on implementation. Some aspects of this process are similar to those in Virtual Access (VA), which has a separate deliverable (D7.2). The process for defining and collecting TA KPIs involved several steps:

1. WP7 surveyed service usage logging capacity across Geo-INQUIRE installations (Feb 8, 2023).



2. WP7 created an initial KPI list based on ESFRI Landmark KPIs and survey results (April-May 2023).
3. WP7 reviewed the list to assess feasibility and relevance (April 2023).
4. PMB and internal WP meetings finalized the harmonized KPI list.
5. The KPIs were discussed at the 2023 Annual Geo-INQUIRE meeting and in WP6/WP7 meetings with other WPs (Nov 2023-Jan 2024). The PMB then set the KPI collection procedure (April-May 2024).

WP2-WP5 and WP8 installations provided KPI values (June-August 2024), which were included in deliverables DX.4 (X=2-5) for month 24. Some KPI values were provided directly by the WP (FAIR score, service readiness, dissemination).

### 3.1 WP7 survey and initial assessment of service usage potential

The Geo-INQUIRE Project Management Office conducted a survey across all 159 Geo-INQUIRE installations to support WP7 in defining KPIs and gather information on installations' services and data. The survey focused on service readiness, integration into RIs, and data/metadata standards. Installations reported on service usage monitoring (e.g., logging systems, user identification, AAI systems) and impact indicators like citations or publications. Those with logging systems provided more detailed KPI data, including user numbers, data request volumes, and usage tracking through citations and DOIs.

The survey results were extensively described and commented through D7.2. We will shortly describe the main outcomes that were discussed and then focus the discussion on TA specific results. The main observations of the survey can be summarized as follow:

- As it was discussed in section 2, there are a large variation in the estimated user number (see table 3), ranging from less than 100 to more than 100 000 per year. Such large variation is not just explained by the detected issue in TA access, there is also large heterogeneity in VA. Additionally, the two access types of behaviour do not evolve in the same levels. The highest numbers correspond to the VA while the lowest correspond to TA. The main reason being that VA accesses are faster and easier to engage that TA.

Number of users	Geo-INQUIRE
Less than 100	32%
100 to 1.000	34%
1.000 to 10.000	17%
10.000 to 100.000	13%
More than 100.000	4%

*Table 2. Estimated number of users across operating or partly operating Geo-INQUIRE installations obtained through the survey in winter-spring 2023.*



- While the installations were displaying a good capacity to monitor the request and users served numbers, they are globally restricted in their mean to get further details on user profile. About half of the installations (45%) have logging capacity only 20% display an AAI system. About one third (31%) of the installation are able to track citations. Therefore, the automation for data collection in regards of KPI can be limited. On the other hand, logging and AAI deployment are not straightforward answers as they can both also induce reluctance to access the services. This consideration is however poorly affecting TA KPIs where the access is not mainly dependant of logging issues with the notable exception of TA to computational resources.

TNA Only (26)	Yes	Partly	0-20%	20-50%	> 50%	No	N/A
Do you provide a service online status?	12	6				8	
Do you have an AAI (Authentication and authorization infrastructure)?	4					22	
Do you have a DMP (Data Management Plan)?	3					20	3
Are all the data and/or data products provided by this service open?	17		3	3	3		
Do you provide machine-readable metadata about your services?	3					22	1
Do you assign persistent identifiers within your service?	6					20	
Have you assigned a license to data?	9					16	

Table 3. Survey results regarding the obligatory section for TA installations (survey master file)

Beside the logging, the TA installations display poor capabilities in terms of connectivity and Data management (Table 3). About 80% of them do not possess a DMP, AAI or persistent identifiers assignment procedure. Logging systems and license data assignment reach respectively 56 and 64%.

The main reasons of those low contributions are difficult to grasp and may vary depending of each situations. Nevertheless, the TA installation are in majority displaying experimental services. To the exception of testing facilities, those communities generally do not apply data standards (Table 4). The majority of the device or services provided leads to results that are not interoperable and hardly reproducible elsewhere. Thus, the community is not that much accustomed to extensive data management and suffer a significant delay in conforming itself in comparison of VA services installations.

Another issue was raised by VA KPI analysis in D7.2. There are frequently different levels of management inside RIs. Those go from a specific sites or installations to core or centralized services that gather data threads of different origins. This setup are treated differently in each RI and also depending of the services. This leads to high heterogeneity in terms of monitoring and KPI evaluation. In comparison, such centralization is not common within TA services. They are mainly provided by the installation themselves. The produced data can be also entirely managed by the

installation and if some of it is delegated to centralized systems, it has generally to do with diffusion and online accessibility matters. Up until now, there are generally no significant aggregation or services related to TA that are distributed beyond the installations. However, this statement should be moderated considering the specificities of TA using HPC resources where the location of the HPC and the physical access to perform the TA can be separate places and thus need aggregation processes at higher scales.

<b>DATA STANDARDS AVAILABLE</b>	<b>ALL</b>	<b>VA</b>	<b>TNA</b>
mseed	16	14	2
QuakeML	13	11	2
stationXML	14	12	2
RINEX	9	8	1
OGC	10	10	0
SINEX	1	1	0
GML 3.1	1	1	0
GML 3.2	1	1	0
GML 2	2	2	0
Smithsonian	4	4	0
GML	4	4	0
KML	3	3	0
GeoSciML-Lite	3	3	0
ESRI ASCII	2	2	0
GEM	2	2	0
Dublin Core	1	1	0
OSGeo	1	1	0
ASTARTE	1	1	0
SEG-Y	1	1	0
PBO Position	1	1	0
PBO Velocity	1	1	0
SRF	1	1	0
HDF5	1	1	0
Bibtex	1	1	0
RDF	1	1	0
PostGIS	1	1	0
Spatialite	1	1	0
VONA Communications	1	1	0
CSEP	1	1	0
NRML	1	1	0
Multi com. Std. Not spec.	9	2	7
None	51	41	10

*Table 4. Survey results regarding data standards use in installations*

The difficulties to comply with the ESFRI KPI list correspond mainly to the weak data management means and culture. One of the great advantages of TA compared to VA is that they can very easily collect all the necessary data regarding users without facing acceptance/attractiveness issues



related to logging. This KPI data collection is commonly achieved through the TA proposal itself that describe users' profiles and planned activities in an extensive way. Some data should also be collected afterwards (publication, TA data usage...) or separately (user request count) and are facing the same issue as in VA KPIs. Table 6 describes the potential of deployment of the different selected ESFRI KPIs in regards of TA.

Objective	KPIs
Enabling scientific excellence	1. Number of users requests for access (S) Easily done by the access provider
	2. Number of users served (S) Easily done by the access provider
	3. Number of publications (I) Not possible at the present time. Requires improved DOI coverage and citation or compliance of the user in the follow up process
	4. Percentage of top (10%) cited publications (I) Not possible at the present time. Requires improved DOI coverage and citation
Enhancing collaboration in Europe	8. Share of users and publications per ESFRI member country (I) Feasible through TA proposal and if KPI N°2 and 3 are measured
Facilitating economic activities	9. Share of users associated with industry and publications with industry (I) partially accessible, namely in terms of users. Regarding publication, it relates on KPI N°3
Optimising data use	14. Number of publicly available data sets used externally (S) feasible but largely dependant of data set definition and availability of a DMP and related services
Provision of scientific advice	16. Citations in policy related publications (I) Not possible at the present time. Requires improved DOI coverage and citation
Facilitating international co-operation	17. Share of users and publications per non-ESFRI member country (I) Feasible through TA proposal and if KPI N°2 and 3 are measured
Optimising management	20. Revenues (S) This can be reported by the installation
	21. Extent of resources made available (S) This can be reported by the installation. However, there are some definition issues for facilities that provide several services in parallels

Table 5. Analysis of TA related ESFRI Landmark KPIs. Green: possible. Yellow: need improvement in data management Grey: not possible at the present stage in any homogeneous, complete and automated way. S and I respectively refer to TA Service provision and Impact.



### 3.2 Definition of KPI groups and harmonised TA KPIs

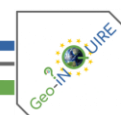
The initial KPIs from steps 1-3 were shared with all PMB members on 8<sup>th</sup> May 2023. They were discussed internally the Geo-INQUIRE work packages, and the final list was agreed by the PMB on 15th June, 2023. Each of WP2-WP5 and WP8 subsequently decided which of the KPIs were applicable in their work package and identify possible gaps in KPI coverage. The outcome was reported in DX.2 (X=2-5) at month 12. The PMB separated the KPI into different KPI groups relating to different KPI types and Geo-INQUIRE activities, also to clarify who would oversee the KPI values collection.

KPI group	Management
SS Service status	WP6
VA Virtual Access usage	WP7
AD Accessible datasets	WP7
ND New datasets	WP7
TA Transnational Access usage	WP7
Dissemination	WP9

Table 6. KPI groups and responsible work packages.

The Virtual access KPIs covers three KPI groups: Virtual Access (VA), Accessible Datasets (AD) and New Datasets (ND). The TA Transnational Access KPIs cover TA Transnational Access usage and are presented in the Table 8. They are organised in four different categories. The TA Offer describes the calls framework. The TA support describes the load of work that was employed by the RIs and hosting sites to support the call and TA accesses. The TA call describes the quantity and characteristics of the accesses that were granted. Finally, the TA Output describe de valuation of the data that were yielded during the TAs. As explained in section 2.1, the TA KPI distribution follows the temporal sequence of an Access:

KPI ID	KPI Group	KPI definition	Collection Strategy
TA-01	TA-offer	Number of sites opening calls	
TA-02	TA-offer	Aggregated number of unit access	
TA-03	TA-offer	Total number of calls	
TA-04	TA-support	Amount of time spent on on-site support	
TA-05	TA-support	Amount of time spent on managing calls	
TA-06	TA-calls	Number of applicants	General information collected to the TARP decisions
TA-07	TA-calls	Number of granted applications	Based on TARP decisions



TA-08	TA-calls	Number of finished programs	
TA-09	TA-calls	Number of countries involved	
TA-10	TA-calls	Number of organizations involved	
TA-11	TA-output	Number of derived data publications	
TA-12	TA-output	Number of paper publications	

*Table 7. TA group KPIs selected in Geo-INQUIRE for testing.*

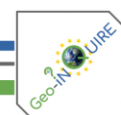
In comparison with the ESFRI table (Table 5), some discrepancies can be commented (Table 8). Some of the KPIs elected by Geo-INQUIRE directly correspond. This is the case for the three first ESFRI KPIs. Some KPIs were not taken into account, either because they appeared to be not relevant considering the time period that was covered (N° 4, 20 and 21) or they were assessed with other KPI groups (N°14). The remaining KPI that were not included (N°8, 9 and 17) can be considered as less a priority to collect in a starting phase than other TA KPIs. Namely the TA KPI assessing the temporal sequence of TA like described above, which are more specific to TA and are not included in ESFRI list.

<b>ESFRI KPIs</b>	<b>Geo-INQUIRE TA KPI</b>	<b>Comments</b>
N°1	TA-06	
N°2	TA-07	
N°3	TA-11 & TA-12	
N°4-21	∅	Partially or not considered
∅	TA-01 to 05 & TA-08 to TA-10	Offer and Support KPIs are not directly addressed in the ESFRI list

*Table 8. KPI comparison between the ESFRI selected KPI list (Table 6) and the Geo-INQUIRE selection (Table 9) for testing.*

It is also observed that in its distribution the Geo-INQUIRE TA KPIs are not covering the data management, leaving that part to VA KPIs. However, this might induce several bottlenecks. The first one is the assessment of TA implementation regarding that stage. As discussed in the previous section and due to its lack of maturity in data management, the community of the TA service providers is likely to display some difficulties in these processes, which would be valuable to assess in order to improve the overall service delivery. Secondly, in order to fully grasp the impact of TAs, it is instrumental to keep track of their contribution in the VA KPI. This impact should not be solely assumed by the publication production.

FAIRness KPIs are not currently part of the ESFRI KPIs, but they are key targets for Geo-INQUIRE, which aims to improve dataset FAIRness, ensure high FAIRness for new datasets, and link FAIRness scores with scientific impact (WP7). FAIRness is actually partially covered by some Geo-INQUIRE KPIs



(AD-03 and ND-03) that will be crucial for the RI's ability to deliver more generic ESFRI publication related KPIs. However, those and the FAIRness evaluation will be specially presented in D7.4 (month 26), D7.6 (month 48), and D7.9 (month 48).

## 4 First KPI values collection and assessment of difficulties

### 4.1 Evaluation of the KPI values collection process: communication and response rates.

The last reports of the M24 period (D8.4, D4.4 and D5.4) state that the TA have just started. The main difficulty in the TA KPI value collection is due to the weak advance of the access implementations. In regards of that situation, it was decided in the 3rd Services Implementation Board (SIB) Meeting (17 February 2025) that the VA KPI value collection would be prioritized in the first stages. If we just consider the few TA KPI values that were collected up until now, no significant communication and response rates delay were observed. Those specific KPI were mainly collected on the basis of received proposals. Each contributing WP providing the numbers through a spreadsheet template. One small discrepancy was however observed in WP4 deliverable (D4.4) that presented a TA KPI table that was slightly different from the one that was officially agreed on and presented in table 8. One additional TA KPI is presented (TA-13) and defined as user satisfaction and TA-08 was defined as “Number of finished research project” instead of “Number of finished programs”. The difference is certainly due to an update, but it also emphasises the difficulty to keep and communicate the same template.

### 4.2 Outcome and feedback from the TA group KPI values collection

TA KPIs values were collected in the WP4, 5 and 8. The compilation of all these contributions is given at M24 in the deliverable D8.4 (Table 9):

KPI ID	KPI Group	KPI definition	KPI Value
TA-01	TA-offer	Number of sites opening calls	<ul style="list-style-type: none"> <li>• Bedretto (3)</li> <li>• Eastern Sicily (5)</li> <li>• INFO (1)</li> <li>• Ligurian Sea (2)</li> <li>• Corinth Rift Lab (2)</li> <li>• EllaLink (0)</li> </ul>
TA-02	TA-offer	Aggregated number of unit access	<ul style="list-style-type: none"> <li>• Bedretto (12)</li> <li>• Eastern Sicily (30 working days, 10 rock samples)</li> <li>• INFO (20)</li> <li>• Ligurian Sea (7)</li> <li>• Corinth Rift Lab ( )</li> <li>• EllaLink (0)</li> </ul>



TA-03	TA-offer	Total number of calls	2
TA-04	TA-support	Amount of time spent on on-site support	<ul style="list-style-type: none"> <li>• Bedretto (0)</li> <li>• Eastern Sicily (5 working days)</li> <li>• INFO (0): No TA completed yet</li> <li>• Ligurian Sea (0)</li> <li>• Corinth Rift Lab (0)</li> <li>• EllaLink (0)</li> </ul>
TA-05	TA-support	Amount of time spent on managing calls	3 PM
TA-06	TA-calls	Number of applicants	<ul style="list-style-type: none"> <li>• Bedretto (0)</li> <li>• Eastern Sicily (2)</li> <li>• INFO (5)</li> <li>• Ligurian Sea (0)</li> <li>• Corinth Rift Lab (1)</li> <li>• EllaLink (0)</li> </ul>
TA-07	TA-calls	Number of granted applications	<ul style="list-style-type: none"> <li>• Eastern Sicily (1)</li> <li>• INFO (3)</li> </ul>
TA-08	TA-calls	Number of finished programs	<ul style="list-style-type: none"> <li>• Eastern Sicily (1)</li> <li>• INFO(0)</li> </ul>
TA-09	TA-calls	Number of countries involved	8 (Slovakia,USA, Spain, Israel, Greece, Poland, Morocco, France)
TA-10	TA-calls	Number of organizations involved	8
TA-11	TA-output	Number of derived data publications	0
TA-12	TA-output	Number of paper publications	0

*Table 9. TA group KPIs values collected in Geo-INQUIRE at M24 (D8.4).*

As stated in section 4.1, only TA KPI values relying on TA proposal were possible to collect at this stage. Those correspond to the TA-offer group and the TA-calls. Nonetheless, TA-08 and TA-04 should be interpreted with care since, contrarily to other TA-calls, they will evolve with time. It also the same situation with TA-05 (TA-support), which account for the amount of time spent on managing calls. This raises concerns about how we should understand KPI definitions. Whether KPIs are dedicated to monitoring the progress of TA, or whether they assess the overall outcome and impact of TA. Another confusion may also rise in regards of the aggregation process. In that matter, only TA-02 is mentioning that the numbers should be aggregated. Nonetheless, it does not precise the level of aggregation (site vs organization vs RI vs call). This is why a lot of TA-KPIs are answered with several values, which for some of them are already an aggregation of WP values (TA-06, 07 and 08).

Similarly, some wording and terms are not specific enough and may give ways to different interpretations:



- “Number of unit access” in TA-02: it is not clear if the unit access belong to a maximum value for each site or as a predefine share of the access availability for the entire call.
- “Amount of time” in TA-04 and TA-05: the time unit is not indicated leading to different types of unit (working days, PM...).
- “Applicants” in TA-06: this term is more precise that “user” that, as sated in section 2.2, could lead to different confusions. It logically refers to those who have registered in the submitted TA proposal. Nevertheless, some improvement could be gained by precisising it, namely stating if we speak of the organization, the main responsible of the proposal or a list of people that will be allowed to access.
- “Programs” in TA-08: the term is not detailed and may even refer to the access itself in order to follow the TA progress. If it is the case, it is then also subjected to an access definition issue in regards of duration (i.e. when does an access ends? After user departure from the site or when the produced data are treated and reported?)
- “Publications” in TA-11 and TA-12: the term is not define. It can be then understood broadly, nevertheless and in such case, it would be nice to provide an overview of the expected targets to set some boundaries (social network publication, newspaper, website news, letter of information...) and to also precise the variation with “paper publication” (scientific, peer reviewed journal, abstracts...).

Among the expected KPI values at this stage, some are still missing. For instance, the Ellalink and Corinth Rift Lab sites in TA-02. The main issue is that the answers are not explicit enough to understand the reason behind this gap. It is clear that the TA-values should be known when the call are launched, thus it is not related to timing and it cannot be logically equal to zero. It can also be interpreted to an absence of answer but then it should be précised.

## 5 Harmonizing Transnational access KPIs across and within RIs: issues and perspectives

The different issues and related advices encountered in Gei-Inquire TA KPI perimeter, definition and collection can be summarized as follow:

Perimeter:

- The junction between TA KPI and VA KPI should be addressed in order to both provide assessment of TA data management implementation and TA impact trough VA of the produced data.
  - Proposal: state that TA domain extend to the entire data management generated through the TA up to the data repository and related accessibility and diffusion. If the data are collected through common services with VA, then each contribution should be quantified separately.
- Some other important aspects of TA assessment were not considered in the KPIs, as for instance the user satisfaction and working conditions quality during the access.



- Proposal: address that issue by proposing the addition of new dedicated KPI in the Geo-INQUIRE existing set (see below).

#### Definition:

- Target aggregation issue: the scope/target of the TA KPI application is regularly not specified and need to be refined. The definitions should outline if the metric is addressing the site, the RI, the organization or the call.
  - Proposal: update the KPI definition accordingly with specific recommendation in the table caption.
- Temporal aggregation issues: some KPI are not precisely described regarding their timing and the extent of the needed data cumulation.
  - Proposal: update the KPI definition accordingly with specific recommendation in the table caption.
- Terminology/unit issues: some terms and wording should be improved to avoid confusion and inconsistencies in the answers.
  - Proposal: add a lexicon that can be used together with the KPI description.
- When there are calculations, a formula or demonstration should be provided as well as references between the different TA KPIs. Using already define TA KPI in another definition build better understanding of each component but also ease the calculation process.
  - Proposal: update the KPI definition accordingly.

#### Collection:

- Ensure the communication of a unique template and its updated versioning.
  - Proposal: add a version number to the list (V1.0 being the first validated list, i.e. Table 7 and V2.0 being the D7.3 proposed update). It is important to mention that the last versioning does not vouch for the table validation by the project management.

KPI ID	KPI Group	KPI definition and formula	Collection means / targets
TA-01	TA-offer	Number of sites opening calls	Answered by the Program or RI managers
TA-02	TA-offer	Aggregated number of access time in days of access	Answered by the Program, RI or site managers
TA-03	TA-offer	Total number calls	Answered by the Program, RI or site managers
TA-04	TA-support	Amount of time in days spent on-site support	Answered by the TA providers
TA-05	TA-support	Amount of time in days spent on managing calls	Answered by the TA providers
TA-06	TA-calls	Number of applicants	Answered by the TA providers



TA-07	TA-calls	Number of granted applications	Answered by the TA providers
TA-08	TA-calls	Number of finished accesses	Answered by the TA providers
TA-09	TA-calls	Number of countries accessing the facility site through TA (TA-07)	Collected through the accepted TA proposals
TA-10	TA-calls	Number of organizations accessing the facility site through TA (TA-07)	Collected through the accepted TA proposals
TA-11	TA-output	Number of derived data publication (journal, online article or post, public report, public video, interviews)	follow-up of users or search with DOI/key words
TA-12	TA-output	Number of paper publications (edited article from journal)	follow-up of users or search with DOI/key words
TA-13	TA-output	Number of data sets made publicly available	Collected through the TA follow-up surveys and from the service providers
TA-14	TA-service	User satisfaction: % of user formally stating that they were satisfied by the TA services	Collected through the TA follow-up surveys

Table 10. Proposal for an updated version of the TA KPIs selected in Geo-INQUIRE for testing (V2.0).

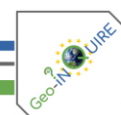
#### Table caption:

The KPIs should precise the range of their scope with precisions in their labels. Thus the KPI ID should be followed by the scale of integration (i.e. Program or RI or Site name, ec: TA-02-GeoInquire). The duration of the reporting period is the last full civil year if not specified otherwise.

- **Access:** for TA an Access is considered to be the period time included between the entry date of the first user to the exist date of the last user in consideration of the submitted proposal. If several proposal have been accepted per the same users during the years, each will account as independent access. If a TA is done with several visit over the year but still correspond to the same proposal, it will account as one access.
- **Applicant:** an applicant corresponds to the person or the team that has submitted a TA proposal.
- **User:** a user is one parson that is physically accessing the facility over the Access.
- **Data set:** data that were produced within the same TA and that need to be kept together to be interpreted (i.e. one TA produce one ore more data sets).

#### Perspectives:

Other issues and responses must also be addressed alongside the KPI definitions. One of these is the need to trace back the contribution of TA to VA and, more generally, to scientific communication. This issue cannot be resolved solely through VA monitoring. D7.2 has already demonstrated that tracking scientific publications is not an easy task.



Among the various discussions held on the subject, ECCSEL and EPOS/MSL have raised, in WP4 and WP7 meetings, the potential benefits of using an identifier similar to a DOI for instruments or facilities. This idea is highly interesting and warrants closer examination. If persistent identifiers were used in scientific publications, they would assist authors in their materials and methods sections by providing direct references for more detailed descriptions. Similarly, each article linked to a specific facility would be tagged with the identifier, making it significantly easier to retrieve related publications.

However, some questions remain. It is still uncertain whether it would be best to tag each experimental setup or material—potentially a very long list in some facilities—or to tag only the facility itself or a specific service within it. Two key factors must be considered: first, the quantity of items to be identified, and second, each facility's capacity to maintain and update such a list. Overall, it seems more realistic to limit the number of identifiers as much as possible without compromising the specificity required for indicators and KPIs. A balanced approach could be to tag only services or setups that typically function together (where services are not clearly defined). To be effective, service DOIs would need to be regularly updated, incorporating versioning and allowing access to previous configurations.

Another issue concerns how we can proceed with this KPI set. How relevant are they beyond the Geo-INQUIRE programme? From the outset, KPI selection has been intended to serve broader objectives. In this sense, they can certainly be applied in other contexts for various types of access and calls. However, some descriptions will need to be adjusted accordingly. The adaptations provided in Table 10's caption could effectively support this purpose by shifting the scope of investigation. For instance, TA-01-Geo-INQUIRE can be used to describe the extent of the Geo-INQUIRE call portfolio, whereas TA-01-ECCSEL would provide an overview of ECCSEL's participation in all available calls.

Finally, the discussions and proposals outlined in these sections should be regarded as a work in progress. D7.3 still lacks substantial TA feedback and will undoubtedly require multiple updates before a consensus is reached on the final recommendations for TA KPIs. In this regard, it should be considered a living document that will serve as a foundation for refining Geo-INQUIRE perspectives.

