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REUSING OPEN DATA: AN EXPLORATORY STUDY IN ECUADOR

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ABSTRACT

The objective of this paper is to carry out an exploratory study on the reuse of open data in Ecuador. For this purpose, thirteen open data portals initiatives in the country have been selected, which were then analyzed based on the MELODA metric, in order to determine the degree of reuse of the portals through five dimensions: Legal, Technical Standards, Information Accessibility, Data Model Sharing, Geolocated Information, and Real-time Information. In this way, the average reuse level of 29.62%, was obtaining, corresponding to a basic reuse. The Real-time information dimension had the lowest rating, while the Technical Standards dimension reported the highest. In turn, of the thirteen active open data portals in Ecuador, 69% reported a basic reuse level and 31% a limited reuse level.

Keywords: *Open Data Reuse, Open Data portals, MELODA, Open Government Data, Open Government*

1. INTRODUCTION

Open data is considered an input of innovation aimed at sustainable development. In addition, more open data contributes to a greater exchange of knowledge [1]. An agency in the public or private sector, in addition to being a producer, is a provider of information that is disseminated as open data, but it also becomes a user by being able to reuse that same data [2].

Benefits or impacts, appropriately called “values”, are expected from open data through its reuse. Reuse is understood as "the use of data for a purpose other than that envisioned by the data producer" [3].

The European Union's open data initiatives are recognized for the progress that they have made globally. According to the Open Data Maturity Report - 2020 [4] adopted by the European Data Portal (EDP), the score achieved by the “Open Data Impact” dimension indicates that it is the least mature, yet again emphasizing the importance of the need to measure the reuse of open data.

According to the study by [5], among the multiple types of additional use that can be given to Open Government Data (OGD), we have innovation, data analytics, decision-making, anti-corruption, smart city, research, new services, and the ability to create value from released public data.

Open data portals are currently becoming more common. However, there are government portals that do not meet the fundamental criteria of data quality and frequently offer low usability for non-technical users [6]. Also, data sharing and reuse have become increasingly important in the development of open data initiatives [7]. However, in practice, data sharing can often be unusable or irreproducible. To solve this problem, it is important to know the degree of reusability of open data published on portals.

There have been some open data studies with different perspectives and connotations. Work [8] provides a general and consolidated view of open data from a technological point of view and classifies and analyses scientific studies. On the other hand, study [9] investigates the current state of the development of linked open data (LOD) portals. It deals with aspects such as functionalities, contributions, value-adds, and user experience. Nevertheless, it does not include an evaluation of their adaptation to user behavior and their influence on the use of linked data collections.

Among the related works that have used the Metric for the Evaluation of Open Data (MELODA) metric, we have: the work of reference [10] that identifies the role of the reuse of information for innovation and new ecosystem services by certain smart cities in Europe. Among the most relevant

results are the licensing conditions that are compatible with open data; Furthermore, CKAN was determined to be the most popular platform. Additionally, geolocation information is found in most of the shared datasets. Also, to be considered [11] measures the data openness level of Saudi Arabia e-Government Data Portal with the Global Open Data Index (GODI) scoring model. The study by [12] performs a rating of the COMUNDA platform of the Vallbona Town Council (Valencia) using the MELODA metric, obtaining a value of 48.3% in the quality of reuse, that is, a good qualitative rating of reuse. In report [13], the reuse of open data in Spain was evaluated according to the MELODA metric with its six dimensions, highlighting that 68.92% of the sample datasets have a basic reuse level. Finally, in study [14], 17 Spanish regions were selected, and a value of 95.15% was obtained, equivalent to an advanced qualitative rating of reuse, with some characteristics that could be improved.

This paper carries out an exploratory study on the reuse of open data in Ecuador. For this purpose, open data web portals initiatives developed in the country have been selected and then analyzed based on the MELODA metric, through which the degree of reuse seen by the portals was measured, and by extension, the current state of open data in Ecuador.

The article is organized as follows: Section 2 presents a theoretical framework and a general description of open data and the MELODA metric; Section 3 presents the methods used; Section 4 presents the results, in Section 5, the results are discussed. Finally, in Section 6, the conclusions of the study are presented.

2. THEORETICAL FRAMEWORK

2.1 Open Data

Open Data is a practice and at the same time a widely accepted trend to publish and share data, but it is also considered as a tool that supports "Open government". According to the Open Data Charter (ODC) "open data is digital data that is made available with the technical and legal characteristics necessary for it to be freely used, reused, and redistributed by anyone, anytime, anywhere" [15]. On the other hand, the Open Knowledge Foundation (OKF) specifies the definition of "Open" in terms of "data", "content". According to the latest definition (version 2.1, 2015) given by OKF, it extends to "knowledge". In this way, information "is open if anyone is free to access, use, modify, and share it"; but still subject to requirements that preserve provenance and openness. Another characteristic of the orientation that the OKF gives to its definition is that it must maximize participation and interoperability [16].

The ODC proposes six principles that will be the basis for the access, publication, and use of open data; of which the first four describe legal and technical characteristics, while the last two describe the purpose and possible uses. These principles are Open by Default, Timely and Comprehensive, Accessible and Usable, Comparable and Interoperable, For Improved Governance & Citizen Engagement, and For Inclusive Development and Innovation [15].

Public sector institutions are the main producers of open data, which is called Open Government Data (OGD). According to the OECD, OGD is more than an open data type, it is a philosophy, a set of open governmental policies, that promotes transparency, accountability, and value creation by making government data available to society in general [17].

2.1.1 Global initiatives related to open data

Various global open data initiatives come from research and practice. These initiatives include methodologies and tools for the measurement of the state of open data in various countries of the world, for example, The Open Data Barometer - ODB [18] and the Global Open Data Index - GODI [19]. On the other hand, we have the five-star framework for the Linked Open Data (LOD) rating proposed by Berners-Lee (2009), which highlights legal and technical openness. The concept of LOD encourages interoperability [20].

The Open Data Maturity Model proposed by the Open Data Institute (ODI) provides support to organizations so that they might assess how well they publish and consume open data and identify actions for improvement [21]. Additionally, platforms for open data portals have been developed. Among the most frequently used, there are the Comprehensive Knowledge Archive Network (CKAN), the Drupal Knowledge Archive Network (DKAN), and SOCRATA [22]. There is also a variety of metadata models and vocabularies used to share data, for example, the Data Catalog Vocabulary (DCAT) and the Dublin Core set of metadata elements [23].

2.2 MELODA

MELODA, was created in 2011 as a reaction to the lack of homogeneity in the datasets published in the open data portals, to analyze the degree of data reuse [24]. For the elaboration of this metric, the three laws of open government data [25] have been examined. 1) It must be accessible by internet. 2) It must be machine-readable. 3) The legal framework must allow for the data to be repurposed. Likewise, MELODA is based on the principles of open

government data [26], which are presented in Table 1.

Table 1. Principles of Open Government Data

Complete	All public data is made available.
Primary	Data is not accessed in aggregate form.
Timely	Data is made available as quickly as necessary.
Accessible	Data is available to the widest range of purposes, and users.
Machine processable	Data is reasonably structured to allow automated processing.
Non-discriminatory	Data is available to anyone, with no requirement of registration.
Non-proprietary	Data is available in a format over which no entity has exclusive control.
License-free	Data is not subject to restrictions on its use.

2.2.1 Dimensions of Analysis

MELODA focuses on obtaining a configuration by evaluating the available information (metadata) of a dataset. This metadata should be made public across the web without, for the most part, any additional requirements. MELODA Version 4.11, which was employed for this work, analyzes six dimensions: 1) Legal, 2) Technical Standards, 3) Accessibility to the information, 4) Data model sharing, 5) Geolocated information, and 6) Real-time information. Up to 5 levels of reuse are considered for each dimension. Depending on the dimension, different weights are assigned for each level.

3. METHODOLOGY

The study has the objective of investigating the open data initiatives that exist in Ecuador. The study is exploratory in scope with inductive characteristics.

The method for the research is a case study, which is conducted on the basis of the process proposed by [27] that consists of four steps, which are: study design and planning, data collection, analysis of collected data, and reporting.

3.1 Study Design and Planning

For this study, the objective and the research questions presented in Table 2 were employed. According to the primary objective of the study, two research questions were formulated, the first (P1) has the purpose of identifying the initiatives located on the web that exist in Ecuador. In turn, this question was broken down into the question in P1.1, as presented in Table 2. Furthermore, considering that the reuse of data is a fundamental principle of open data, utilizing the second research question (P2), it is possible to measure the degree of reuse of the selected initiatives (from P1) to be observed and analyzed.

Table 2. Case Definition

Objective:	Inquire about the open data portals initiatives that exist in Ecuador.
Research questions:	Q1: What open data portals initiatives exist in Ecuador? Q2: What is the degree of reuse of open data portals initiatives in Ecuador?

The cases that were identified were open data initiatives developed in Ecuador that are available as web portals. Due to the variety of the contexts of each of the cases, these, in turn, constitute the units of analysis.

To select the cases to be studied, the process indicated in Figure 1 was followed, which begins with the definition of the following search string for Google: *("open data" OR "datos abiertos" OR "catálogos datos abiertos") site:.ec*

The search string allowed combining the words "open data" in Spanish and English with "open data catalogs" using the logical OR operator. It was limited to all possible Ecuador domain websites. Once the search was applied, the most relevant results were obtained, omitting certain similar entries. 50 relevant sites that met the criteria were obtained.

Subsequently, the number of web portals initiatives obtained was delimited through an exhaustive review of their content. Those whose content presented news or informative pages of open data were discarded. Portals initiatives that publish or have published datasets were considered, resulting in 15 web portals to be considered for the next review phase, which constituted the units of analysis or cases selected for the study.

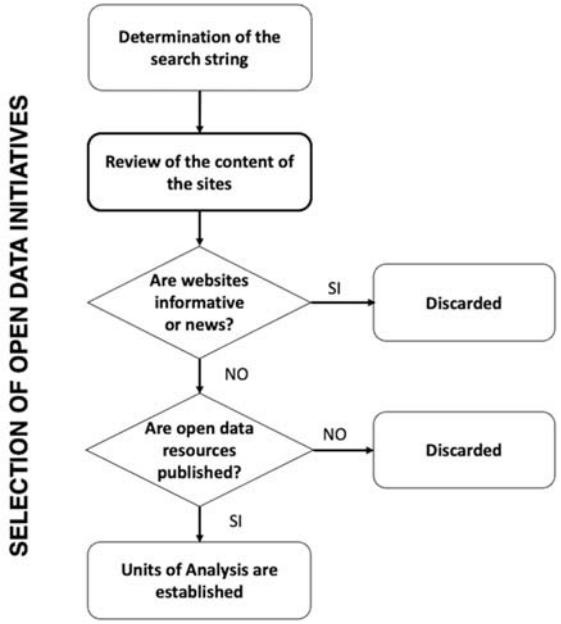

Figure 1. Flow for the selection of cases

3.2 Data collection strategy

The data collection strategy was performed by observing the web portals that constitute open data initiatives in Ecuador and the data collection itself was carried out according to the MELODA methodology.

3.3 Data analysis strategy

Open data initiatives have encouraged the reuse of data that comes from various sources, but the principal source for obtaining them is the Internet. The reusability criterion is a fundamental principle of open data. For the data analysis as illustrated in Figure 2, a classification of the selected cases is carried out in the first instance, which will be analyzed based on the dimensions and metrics proposed in the MELODA methodology [23].

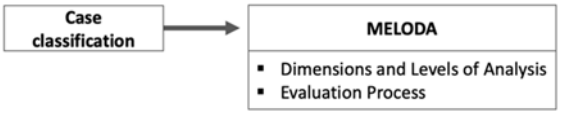

Figure 2. Strategy for data analysis

Case classification

The open data initiatives have been classified according to the four factors presented in Figure 3, which are: status, content coverage, type of initiative, and scope.

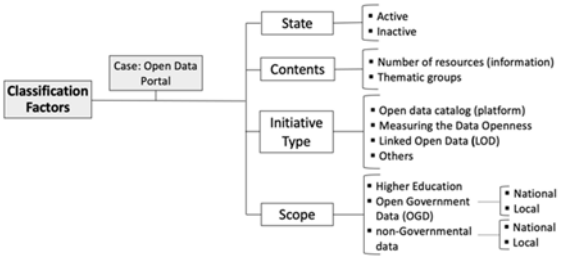

Figure 3. Case Classification Factors

The Status Factor classifies the cases that correspond to the web portals of initiatives as Active or Inactive.

The Content coverage factor observes the portal to determine the resources it includes (dataset, maps, among others), as well as the topics it covers to share data.

The Initiative Type Factor classifies the sources according to the orientation of the web portal, thus we must use an open data catalog for monitoring to measure data openness, for interoperability with linked open data (LOD), or a type other than those contemplated.

The Scope Factor classifies the open data initiatives according to the type of organization responsible, the provider for the initiative, according to the following: governmental, non-governmental, or university.

Dimensions and Levels of Analysis

Table 3. MELODA's Dimensions and Levels

Dimension	Level	Description	Weight (%)
Legal	1	Copyright	0
	2	Private use	10
	3	Non-commercial reuse	25
	4	Commercial reuse.	90
	5	No restrictions or only attribution	100
Technical Standards	1	Closed standard non-reusable	10
	2	Closed standard reusable and open non-reusable.	35
	3	Open standard reusable.	60
	4	Open standard,	100

Dimension	Level	Description	Weight (%)
		individual metadata	
Accessibility to the information	1	No web access or manual request	0
	2	Web Access URL with registration or with web interaction	10
	3	Web access or unique URL parameters to dataset	50
	4	Web Access unique with parameters to single data	90
	5	API or query language	100
Data model sharing	1	Not known data model.	15
	2	Own ad hoc data model	35
	3	Own ad hoc data model published	50
	4	Local open data model	90
	5	Global open data model	100
Geolocated information	1	No geographic information	15
	2	Simple text field	30
	3	Complex text field (several fields with text description)	50
	4	Coordinates	90
	5	Full geographical information.	100
Real-time information	1	Longer than week: Updating period is longer than a week.	15
	2	Days: Updating period ranges from 1 day to 7 days	40
	3	Hours: Updating period ranges from 1 hour to 24 hours.	70
	4	Minutes: Updating period ranges from 1 Hour to 1 minute.	90
	5	Seconds: Updating period is lower than 1 minute. It is a DataJet.	100

Source: [28].

Evaluation process

Figure 3 presents the reusability evaluation process, based on MELODA 4.11.

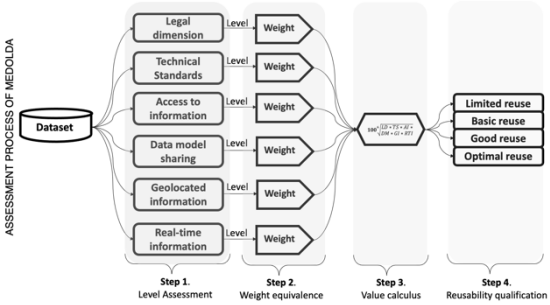

Figure 3. Evaluation process based on MELODA.

The process requires the evaluated dataset to be the same as that which is published in the open data portals. To determine the degree of reuse of the information, 4 steps are considered:

1) Evaluation of the six dimensions of analysis. As a result, the level (1-5) is obtained, in which the dataset is positioned according to each dimension evaluated.

2) Determination of the weights that are assigned to each of the levels obtained as a result of the evaluation of the dimensions, according to Table 3.

3) Calculation of the final score using the sixth root of the product of the scores obtained in each dimension, the formula (1) that allows for the realization of a more uniform distribution of the results. In addition, the effect that a change in the score of one or more dimensions has on the degree of reuse can be analyzed.

$$MELODA = 100\sqrt[6]{ML * ET * AI * MD * IG * ITR} \quad (1)$$

Where:

ML = Legal

ET = Technical Standards

AI = Accessibility to the information

MD = Data model sharing

IG = Geolocated Information

ITR = Time-real information

4) After evaluating the results with the collected data, the degree of reuse was determined based on Table 4 that presents the reuse ranges between 0 and 100. The lowest level of reuse is "limited reuse" and the highest level is "optimal reuse".

Table 4. Overall rating based on the evaluation of the results.

Range	Categories	Simple term	Icon
0 to 25	Inadequate for reuse	Limited reuse	
25 to 50	Basic Reuse possible	Basic reuse	
50 to 75	Reuse possible but with some improvable characteristic	Good reuse	
75 to 100	The best for reuse	Optimal reuse	

Source: [28].

4. RESULTS

P1: What open data portals initiatives exist in Ecuador?

Based on the case selection strategy presented in section 3 of this document, the open data portals initiatives were limited to 15 cases, which are listed in Appendix A and whose summary is presented in Table 5.

Table 5. Open Data Portals Initiatives in Ecuador

Cases-Initiatives			Initiatives Number
Status	Active		13
	Inactive		2
Scope	Academic		5
	Governmental Organization	National	7
		Local	2
	Non-Governmental Organization	National	4
		Local	0

P2: What is the degree of reuse of open data portals initiatives in Ecuador?

To determine the level of reuse of open data, the corresponding statistical analysis was carried out (see table 6). The results are interpreted as follows:

Table 6. Descriptive statistics of the portals dimensions analysis.

Statisticians	Dimension					
	Legal	Technical Standards	Access to information	Data model sharing	Geolocated information	Real-time information
Median	3,462	2,615	2,923	1,615	2,000	1,077
Mode	3,000	1,000	3,000	2,000	1,000	1,000
Standard deviation	0,877	1,261	0,862	0,650	1,414	0,277
Sample variance	0,769	1,590	0,744	0,423	2,000	0,077
Rank	2,000	3,000	3,000	2,000	4,000	1,000
Minimum	3,000	1,000	2,000	1,000	1,000	1,000
Maximum	5,000	4,000	5,000	3,000	5,000	2,000

Dimension 1: Legal

Considering that the average value of the weight of the legal dimension is 3.46, it is evident that 3 portals of the 10 active portals are above the average and the remaining 10 portals are below it. Also, it can be noted that 77% of the analyzed portals are located at level 3, which allow the reuse of data for non-commercial purposes, this result is corroborated by the value of the mode shown in Table 6 for this dimension, while the remaining 23% (C3, C6, and C11) have a level 5 compliance, since they have a licensing type Attribution 4.0 International (CC BY 4.0), which allows the data to be copied and redistributed in any medium or format for any purpose, including commercially.

Dimension 2: Technical Standards

Of the 13 portals analyzed, 8 reach a level higher than the average of 2.6; while the remaining 5 are below the average. Therefore, the majority of portals meet the requirements of surpassing levels 1 and 2.

Additionally, it can be observed that the value of the mode is bimodal since most of the portals are classified according to the extreme levels (level 1 and 4), 31% of the portals hit level 1, that is, they do not have Reusable standards, 31% are at level 4 of this dimension since they have open standards, while the remaining 38% are located at intermediate levels (level 2 and 3), that is, they use closed reusable and open non-reusable standards.

Dimension 3: Accessibility to the information

Taking into account that the mean value of the weights of the access to information dimension is 2.92, it can be reported that 9 portals are above the average and the remaining 4 are below it. Furthermore, it can be observed that the value of the mode is 3, which implies that the majority of the portals (54%) reach level 3, in other words, they have

web access or URL parameters for dataset downloads. 31% are located at level 2 indicating that access to the data sets is done through manual user interaction or through registration, only 15% reach levels 4 and 5, that is, they allow adequate access to dataset information.

Dimension 4: Data model sharing

Based on the Data Model Sharing dimension, 7 portals are above the mean value of 1.61 and the remaining 6 portals are below it. Additionally, it can be noted that most of the portals analyzed (92%) are placed at the lowest levels (1,2), that is, they do not have a data model or if they do, it is their own.

Dimension 5: Geolocated information

The mean value of the weights of this dimension is 2. Only 3 portals are above the average and the remaining 10 are below it. This implies that most of the portals only meet the achieve levels 1 and 2. Additionally, it can be observed that the value of the mode is 1, that is, 54% of the portals do not have any type of geographic information; 23% have a simple text field of geographic information and only 3 portals (23%) comply with levels 4 and 5, which implies that they have geographic information and/or coordinates.

Dimension 6: Real-time information

The mean value of the weights of this dimension is 1.07, this being the lowest value of all the dimensions analyzed. Even with that fact taken into consideration, only 1 portal is above the average value. Additionally, the mode is 1, which indicates that most of the portals (92%) reach only level 1, that is, the information is updated monthly, annually, or after a longer period.

On the other hand, when observing Figure 5 and taking into account what is specified in the MELODA 4.11 standard, of the 13 portals analyzed, 9 have a Basic Reuse degree because the weight achieved after evaluating the 6 dimensions is less than 25%, while 4 portals have a Limited Reuse level, since the weights achieved are in the range of 25% and 50%.

These results show that in Ecuador 69% of the initiatives correspond to Basic Reuse and 31% to Limited Reuse. In general, open data initiatives are in their early stages.

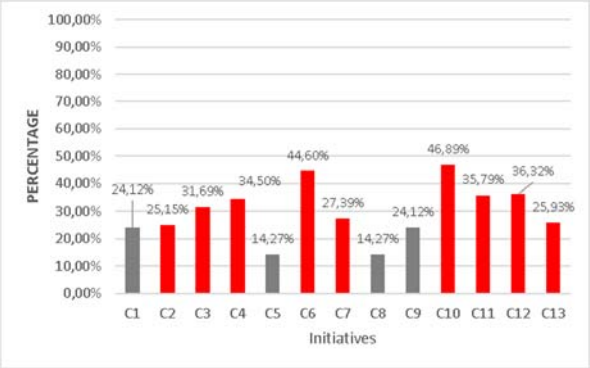

Figure 5. Degree Of Reuse Of The Analyzed Portals

5. DISCUSION

The results obtained from the exploratory study of the reuse of open data in Ecuador are not far from the studies carried out in other countries, the study [13], according to the analysis of datasets that are available in open data portals in Spain according to the MELODA metric and its six dimensions, 68.92% have a basic level, followed by 26.35% of portals that are at an adequate level. These results compare closely to the results obtained in this research, where 69% of the portals have a basic reuse level and 31% have limited reusability. It is evident that Spain has made very important advances in the reuse of open data, while Ecuador is in its initial stages. Also, in Ecuador, 13 open data portals have been identified, while in Spain, as of 2019, 279 have been identified, greatly exceeding the portals published in Ecuador.

Another important study is that of [11], where the openness of data was measured, based on 11 parameters, of which 6 are related to the MELODA dimensions: In Digital Format, Publicity Available, Available Online, Machine Readable, Openly Licensed, and API Enabled. The results presented show the following openness levels: Taiwan 62.62%, United Kindom 69.62%, Denmark 61.46%, Colombia 60.23%, Finland 60.54%, and Saudi Arabia 32.23%. Although these results were as of 2016, all these countries surpass Ecuador, which has an average reuse level of 29.62%.

An analysis of open data in Latin America, 2020 [29], shows the ranking of the OLACEPS member countries (22 countries), including Ecuador, expressed in the ODB and GODI indices. This study shows through both indices that the position achieved by the OLACEFS countries in their progress in open data is dispersed, highlighting among them 5

countries that lead the region: Mexico, Brazil, Uruguay, Colombia, and Chile, whose positions are also considered in the group of world leaders (Top 30). Ecuador ranks 67th, corresponding to an intermediate level of maturity. It should be noted that Ecuador has implemented policies, government actions on the subject of open data, which has allowed Ecuador to position itself there, which is in accordance with the basic level of data reuse at which Ecuador is cataloged.

6. CONCLUSIONS

This exploratory study focused on the reuse of open data in Ecuador. Through a case study two research questions were proposed.

Q1: What open data portals initiatives exist in Ecuador?

The number of web portals initiatives obtained was delineated through an exhaustive review of their content. Fifteen web portals initiatives were initially selected, of which 2 were eliminated from the study because they were inactive at the time of the evaluation. Thus, 13 portals were considered. Of these, 9 belong to the governmental sector and 4 correspond to non-governmental organizations. It should be noted that 5 open data portals are initiatives that come from Academia.

Q2: What is the degree of reuse of open data portals initiatives in Ecuador?

According to the analysis carried out with MELODA, of the 13 open data portals initiatives active in Ecuador, 69% reach a degree of basic reuse and 31% a limited reuse. On the other hand, if the average percentage of the values is considered according to the reuse levels of all the MELODA dimensions, a result of 29.62% is obtained, which indicates that, in Ecuador, the reuse of open data registers at the basic level.

The results of this study can serve as the basis for future work aimed at improving the utility and reuse of open data. In the same way, the quality assurance of open data is a future work of special interest to increase the efficiency and frequency of data utilization.

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APPENDIX A: Cases and open data portals initiatives in Ecuador

ID	OPEN DATA PORTALS INITIATIVES	URL	INSTITUTION	DESCRIPTION
C1	Dspace (Digital Repositories and Libraries of Ecuador)	https://www.bibliotecasdelecuador.com/cobuec/quees.html	COBUEC (Consorcio de Bibliotecas Universitarias del Ecuador)	The portal collects and saves the research works that are developed in the different Ecuadorian academic institutions. It is accessed through an open search engine and is intended to be a very useful tool for the entire university community and, especially, for students, teaching staff and researchers. The Collector of Open Science offers in "Open Access" about many full-text records on research papers, graduate theses, theses and class material that the different Ecuadorian universities have made available to the public.
C2	Ecuador Open Data Catalog	http://catalogo.datosabiertos.gob.ec/	MINTEL	Official portal of the Ecuadorian government, where data from public institutions are concentrated for dissemination, sharing, and the use of public data is promoted.
C3	National Archive of Statistical Data and Metadata (ANDA)-INEC	https://anda.inec.gob.ec/anda/index.php/catalog	INEC	ANDA is a catalog-type platform of open data for dissemination and at the same time a repository of the methodologies produced by the INEC.
C4	INEC Open Data Base	http://aplicaciones3.ecuadorencifras.gob.ec/BIINEC-war/	INEC	The INEC Open Data Base allows the statistical information of the institute to be consulted Application for queries (with keywords) of statistical information produced by the INEC.
C5	Open Data Catalog	http://gobiernoabierto.quito.gob.ec/?page_id=1620	Municipio de Quito	Information regarding the departments of the Municipality of the Metropolitan District of Quito
C6	Open Data (Municipality of Loja Ecuador)	https://demo.ckan.org/tl/organization/about/datos-abiertos-municipio-loja-ecuador	Municipio de Loja	Open Data of the Municipality of Loja Ecuador
C7	Ecuador Open Access Repository Network - RRAAE	rraae.org.ec	CEDIA	Its purpose is to facilitate the management, decentralization, organization, preservation and interoperability of open access digital content, generated by the institutions of the country's academic-scientific community
C8	UTPL - Linked Open Data	http://data.utpl.edu.ec/?q=es/datos_abiertos	UTPL	Not available
C9	Digital Repository FLACSO Ecuador	https://repositorio.flacsoandes.edu.ec/	FLACSO ECUADOR	Digital Library for research in Social Sciences
C10	Data Catalog IGM Ecuador	http://www.geoportaligm.gob.ec/geonetwork/srv/spa/catalog.search#/home	Instituto Geográfico Militar	Open Data Catalog of Instituto Geográfico Militar del Ecuador
C11	Public Procurement Open Data	https://portal.compraspublicas.gob.ec/sercop/data-estandar-ocds/	Servicio Nacional de Contratación Pública (SERCOP)	Initiative "Open contracting" in support of the Transparency of Public management. Use the standard "Open Contracting Data Standard (OCDS)"
C12	Data Portal SIGTIERRAS - MAGAP	http://metadatos.sigtierras.gob.ec:8080/geonetwork/srv/spa/catalog.search#/home	Ministerio de Agricultura y ganadería (MAGAP)	Cartographic metadata catalog
C13	Data download IG-EPN	https://www.igepn.edu.ec/solicitud-de-datos/formulario-descarga-de-datos	Instituto Geofísico de la Escuela Politécnica Nacional (IG-EPN).	IG-EPN portal with an option to share data, download option after registration

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ID	OPEN DATA PORTALS INITIATIVES	URL	INSTITUTION	DESCRIPTION
C14	Open Government Platform	https://gobiernoabierto.ambato.gob.ec/	Gobierno Municipal de Ambato	Not available
C15	Open Data of Carchi	https://datosabiertos.carchi.gob.ec	Gobierno Provincial de Carchi	Not available

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APPENDIX B. Levels and weights collected in the case studies, based on the MELODA dimensions

No.	INITIATIVE	MELODA DIMENSIONS												MELODA	REUSABILITY QUALIFICATION
		DIMENSION 1 LEGAL		DIMENSION 2 TECNICAL STANDARS		DIMENSION 3 ACCESSIBILITY TO THE INFORMATION		DIMENSION 4 DATA MODEL SHARING		DIMENSION 5 GEOLOCALED INFORMATION		DIMENSIÓN 6 REAL-TIME INFORMATION			
	Analysis Unit	Level	Weight	Level	Weight	Level	Weight	Level	Weight	Level	Weight	Level	Weight		
C1	Dspace (Digital Repositories and Libraries of Ecuador)	3	25%	1	10%	3	50%	2	35%	2	30%	1	15%	24,12%	LIMITED REUSE
C2	Ecuador Open Data Catalog	3	25%	3	60%	3	50%	1	15%	1	15%	1	15%	25,15%	BASIC REUSE
C3	National Archive of Statistical Data and Metadata (ANDA)-INEC	5	100%	3	60%	3	50%	1	15%	1	15%	1	15%	31,69%	BASIC REUSE
C4	INEC Open Data Base	3	25%	3	60%	3	50%	3	50%	2	30%	1	15%	34,50%	BASIC REUSE
C5	Open Data Catalog	3	25%	1	10%	2	10%	1	15%	1	15%	1	15%	14,27%	LIMITED REUSE
C6	Open Data (Municipality of Loja Ecuador)	5	100%	4	100%	5	100%	2	35%	1	15%	1	15%	44,60%	BASIC REUSE
C7	Open Data (Municipality of Loja Ecuador)	3	25%	4	100%	3	50%	1	15%	1	15%	1	15%	27,39%	BASIC REUSE
C8	UTPL - Linked Open Data	3	25%	1	10%	2	10%	1	15%	1	15%	1	15%	14,27%	LIMITED REUSE
C9	Digital Repository FLACSO Ecuador	3	25%	1	10%	3	50%	2	35%	2	30%	1	15%	24,12%	LIMITED REUSE
C10	Data Catalog IGM Ecuador	3	25%	4	100%	4	90%	2	35%	4	90%	1	15%	46,89%	BASIC REUSE
C11	Public Procurement Open Data	5	100%	4	100%	2	10%	2	35%	1	15%	2	40%	35,79%	BASIC REUSE
C12	Data Portal SIGTIERRAS - MAGAP	3	25%	2	35%	3	50%	2	35%	5	100%	1	15%	36,32%	BASIC REUSE
C13	Data download IG-EPN	3	25%	2	60%	2	10%	1	15%	4	90%	1	15%	25,93%	BASIC REUSE
MEDIA			42,31%		55,00%		44,62%		26,92%		36,54%		16,92%	29,62%	