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RESEARCH ARTICLE

Global Open Data in Agriculture and Nutrition (GODAN) initiative partner network analysis [version 1; peer review: 2 approved with reservations]

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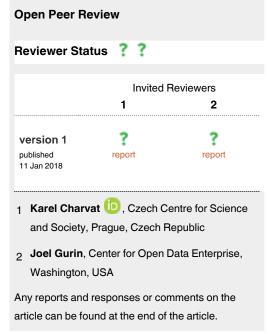[2]Wageningen University and Research Centre, Wageningen, The Netherlands

Abstract

Background: Ensuring healthy, safe and nutritious food for everyone is a global concern. Accessing the information to make the correct decisions regarding food security can be challenging. Open data has been shown to help solve practical problems related to agriculture and nutrition, enabling effective decision-making. In order to create a global data ecosystem that benefits everyone, a wide range of stakeholders must be included in the conversations. The GODAN initiative involves a network of over 500 partner organizations committed to open data in agriculture and nutrition.
Methods: We analysed data from a survey of the partner organizations, with 225 respondents, to determine open data activities, including challenges, use of open data, stakeholder involvement and future directions. Respondents were asked a variety of free text and multiple choice questions.
Results: 160 partners had at least one open data activity, 65 did not, or did not know. Of the 160, 36 had a second activity. Overall, GODAN partners are developing 200 open data activities. Agriculture is the most common focus for an open data activity. Nutrition-only activities are strongly underrepresented. The most frequently mentioned challenge was cost, which is linked to data governance, management, and human capacity; many do not have the funding to begin or maintain open data activities.
Conclusions: The most common challenges were the ones related to the data itself, including how to access it, manage it, and how to keep the sensitive data secure. GODAN is already focusing on these issues through the Responsible Data and Data Ownership pieces. Capacity building, and empowering partners with the tools they need to act, is one of the most effective actions available for GODAN. Funding for open data, as well as research to create more sustainable business models, should be the focus of the open data agenda.

Keywords
open data, agriculture, nutrition, collaboration, partnerships, godan

This article is included in the Global Open Data for

Agriculture and Nutrition gateway.

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Introduction

The challenge of global food security is expected to intensify over the coming decades due to an increase of 2 billion people on the planet by 2050 and 1 billion people at risk of hunger and malnutrition in the same time frame[1,2]. Food security can hopefully be achieved through sustainable agriculture, innovative business models, and political will, however, access to information will be crucial to achieve this goal. Open data, which is data anyone can access, use, or share[3] is key for access to information, and research has shown that open data can help enable effective decision-making and practical problem solving. Open data and transparent processes can trigger organization and sector change to provide innovations to benefit all[3]. The Global Open Data for Agriculture and Nutrition (GODAN) initiative uses the FAIR principles (Findable, Accessible, Interoperable, and Reusable) to conceptualize the full meaning of open data[4]. Open data does not exist in isolation, it must develop in the context of a global data ecosystem, which considers all stakeholders and their data needs[5].

A vast amount of data and information has been gathered about agriculture, food security, and nutrition, which vary by language, units, size, subject matter, and management structure and process. Agriculture alone has an especially large number of stakeholders involved, all of which are in multiple locations within the agricultural supply chain (provider to consumer of crops) and the data supply chain (provider to consumer of data). Partnership, collaboration, and data sharing are important for two stages:

1) To create a global data ecosystem that is useful for all stakeholders, while releasing data responsibly, and with consideration of data ownership and security; and

2) To use the global data ecosystem to achieve global food security[5].

Open data in agriculture and nutrition is an emerging topic, and often a delicate one. Individuals and organizations are not sure of best practices, challenges, and consequences of releasing data openly. Cooperation, collaboration, and partnerships are necessary to building trust in creating a shared data ecosystem. The GODAN Partner Network (currently in November 2017) has 600 partners from national governments, non-governmental, international and private sector organisations that have committed to a joint Statement of Purpose[6], provides a collaborative space to convene like-minded people who seek to advance open data in the agriculture and nutrition agenda.

When an organisation commits to join GODAN partner network, they agree to:

- advocate for open data initiatives for agriculture and nutrition

- release agriculture and nutrition data

- increase awareness of agriculture and nutrition open data initiatives

- advocate for collaboration amongst the partnership network

- advocate for good practices and lessons learned for open data in agriculture and nutrition

This research article paper analyses their activities and challenges, to learn how GODAN can equip partners with tools they need, empower them to achieve their goals and overcome challenges, and convene partners together both in workshops and online to build trust and collaborative power. Additionally, this information can help others learn from the GODAN partner network and to build on the research.

About GODAN

The Global Open Data for Agriculture and Nutrition (GODAN) initiative was the result of the 2012 G-8 Summit and the 2013 G8 International Conference on Open Data for Agriculture. The initiative and Secretariat was formally announced at the Open Government Partnership Conference in October 2013.

G-8 leaders created GODAN to "share relevant agricultural data available from G-8 countries with African partners" and to 'obtain commitment and action from nations and relevant stakeholders to promote policies and invest in projects that open access to publicly funded global agriculturally relevant data streams, making such data readily accessible to users in Africa and world-wide, and ultimately supporting a sustainable increase in food security in developed and developing countries.'

Methods

In order to become a GODAN partner, organizations register on the GODAN website (www.godan.info/partners), which is linked to a Customer Relationship Management (CRM) system (CiviCRM). When registering, potential partners must give organization name, freetext info, location, website, logo, organization type, and point of contact information. This is the only information GODAN has on all partners. Partners must then agree to a commitment to open data in agriculture and nutrition, or recognize the importance of open data to achieve food security goals. There is no fee or membership cost. The reason for this is to allow the partner network to be as inclusive as possible. Once a partner has registered, a point of contact from the organization is sent a link to the survey. Partners can choose to take the survey or not. GODAN partners that have responded to the survey are hereafter referred to as "respondents".

The purpose of GODAN is two-fold: to help raise awareness about the different open data activities that are happening in the network, and to help organizations who are seeking data to find potential partners and overcome open data challenges. At its inception, the GODAN Secretariat believed that in order to facilitate partnerships and effectively advocate for open data, the Secretariat must survey partners and their open data activities. The survey was created in Survey Monkey collaboratively by eight members of the GODAN Secretariat. The complete survey "BQ sample", as it

was presented to GODAN partners, is included as a PDF document in this research article (Supplementary File 1). The survey aims to profile the organizations and their open data activities, as well as the challenges that accompany these challenges.

Respondents are asked a variety of both free text and multiple choice questions to clearly state their opinions, challenges, and needs in open data, and the various open data activities they are involved with. This information helps both partners and the wider community to see how open data in agriculture and nutrition is developing, and exactly who is doing what. Respondents do not have to complete the entire questionnaire. The first GODAN partner survey was sent to partners on April 10, 2015 and was sent to partners as they joined. On February 10, 2017, the GODAN Secretariat revised the survey. This paper analyzes the results of the first survey.

Both authors of this article analysed the results of the survey using Microsoft Excel 2013 downloaded as a CSV file from Survey Monkey. An anonymised version of this downloaded CSV file is included as a dataset in this article (Dataset 1), which does not include name of organization or contact info). To ensure privacy, we removed the information about challenges, and included it as a separate spreadsheet (Dataset 2). Quantitative results used formula analysis in Excel, and qualitative results involved Excel search functions and human confirmation of results.

Ethical statement
Considering the absence of identifying information in data published in aggregated form here, and the non-sensitive nature of the survey, no ethical approval was sought for this study. No information presented here can be used to identify survey participants, and in accordance with SurveyMonkey's data privacy policy (https://www.surveymonkey.com/mp/policy/privacy-policy/), is not accessible to third parties.

It is not a requirement of the GODAN partner network to fill out the survey. When sending the survey to new partners, we state, "After analysing the questionnaire data, we will use the aggregated information to show how the open data community in agriculture and nutrition is developing and who is doing what", thus resulting in this research article.

Results
Between April 10, 2015 and February 6, 2017, 225 of 432 GODAN partners had filled out the partner survey. Nine were from different representatives of the same organization. This represents 53% of the GODAN Partner base at that time. Geographical and sector data is collected from partners at registration (Table 1, Table 2). Generally, the survey is a balanced representation of our partnership network as a whole. However, our partnership network is heavily skewed towards Africa, Europe and North America. The survey is also skewed towards universities and research institutions, and private sector completing the survey compared to its distribution in the Partner Network.

GODAN partners primarily use open data to achieve goals around sustainable food production and food security (Table 3).

Table 1. Regional representation of survey respondents compared to total GODAN partner representation, both raw numbers and percentage.

Region	Respondents		Total GODAN Representation	
	#	%	#	%
Africa	75	33	122	28
Europe	71	32	126	29
North America & Caribbean	39	17	96	22
Asia	27	12	59	14
Central & South America	6	3	15	3
Pacific	5	2	6	1
Middle East	2	1	8	2
TOTAL	225	100	432	100

Table 2. Sector representation of survey respondents compared to total GODAN partner representation, both raw numbers and percentage.

Sector	Respondents		Total GODAN representation	
	#	%	#	%
University/Research Institution	45	20	50	12
Private Sector	58	26	120	28
Other	12	5	37	9
NGO	38	17	74	17
Government	21	9	57	13
International Organisation	12	5	21	5
Foundation	34	15	59	14
No response	5	2	14	3
TOTAL	225	100	432	100

Table 3. Answers to the question on how open data is used. Multiple choice question, respondents could choose more than one option. The numbers represent how many times the options were selected.

Do you use open data to achieve any of the following goals?	
Sustainable production	95
Food security	93
Value chain improvement	82
Business creation (e.g. start-ups)	79
Poverty alleviation	74
Nutrition improvement	71
Gender balance	42

The focus of open data is primarily on economic gain, with the social aspects less of a focus, especially gender balance.

When the survey began, the GODAN Secretariat believed that those who joined GODAN would already be working with and producing open data and have open data activities to share (Table 4).

160 partners have at least one open data activity, 65 do not, or do not know. Of the 160, 36 have a second activity, and 4 have a third. Overall, GODAN partners are developing 200 open data activities. Agriculture is the most common focus for an open data activity, with a joint agriculture and nutrition activity close second. Nutrition-only activities are strongly underrepresented (Table 5). A general observation is that most of the "neither" responses focus generally on open data, open access and open government (see Anonymized Partner Survey Spreadsheet).

Most GODAN partner respondents are involved with data collection and publishing (Table 6). However, about half of respondents were involved with four or more aspects of open data listed in Table 6. Sixteen respondents were involved with all seven aspects, 26 with six, 38 with five, and 37 with four.

Table 4. Number of open data activities that survey respondents are engaged in. Multiple choice question.

Does your organisation have one or more open data activities?	
Yes	160
No	41
I don't know	25
Total	225
Yes, has a second open data activity	36
Yes, has a third open data activity	4
Total number of open data activities	200

Table 5. Focus of open data activities of survey respondents. Multiple choice, respondents selected agriculture and/or nutrition, 'neither' was when the respondent did not check either agriculture or nutrition.

Is [the open data] activity focused specifically on:	
Agriculture	93
Nutrition	9
Both	72
Neither	26

Table 6. Aspects of open data that respondents are involved in. Respondents were allowed to choose more than one option.

Is your organisation involved in one or more of the following open data aspects in agriculture and nutrition?	
Data collection	153
Publishing	121
Data intermediary	119
Service provider	111
Data provider	110
End user	110
Academic and applied Research	100

Data collection means sourcing any data directly through research, instrumentation, surveys or other methods. Publishing includes producing static products drawing upon your own open data, and/or open data from others. A data intermediary makes open data more accessible for others, through creating applications, interfaces or derived datasets. A service provider uses open data to support services such as farm extension, weather information, market information, etc. A data provider makes open data available to others, and an end user uses open data directly, or through an intermediary, to affect their practice (e.g. farmer/farmers' organisation, advocacy organisation, practitioners). These details were given along with the question (see BQ sample; Supplementary File 1).

Table 7 analyses activities the respondents described. All partners were asked an open-ended question to describe their open data activity with no text limit. To analyse the activities, the GODAN research team created a word frequency table (Table 7) based on text mining in the free text sections and categorized them. When text mining, the authors used the search method in Excel. Activities marked with an asterisk (*) show the search term used, which accounts for variability in the ending of the word (ex: app* includes app, apps, application, applications). The authors personally viewed the results to ensure that the word was used in the correct context. (ex: "approach" is not included under app*). The words were checked by one of the authors to ensure that they were taken in the correct context. All information to determine these results are in Anonymized Partner Survey Spreadsheet.

Under methods of working, collaboration, sharing, and open access are on the top of the list. In terms of outputs, research and publications were the highest (but we are not sure if it is research data and published data and otherwise), and platforms, portals, and tools feature highly as well. Some initiatives, centers, and policies are created as well.

Governments are the most common stakeholder to engage with when it comes to open data, which makes sense since they are

Methods of working	
Collaboration	10
Sharing	10
Open access	8
Visualise/ze	5
Capacity building/development	5
Value chain	3
Reusability	1
Interoperability	1
Open science	1
Market prices	1
Outputs	
App*	36
Research	28
Publication/Publish	24
Services	23
Initiative	21
Platform	14
Portal	13
Tool	12
Training	11
Policy	10
Event	10
Fund*	10
Hackathon	5
Library	4
Repositor*	4
Infrastructure	4
Center	3
Beneficiar*	3
Archiv*	2
Ontology	1
Data	
Map	15
Dataset	7
Model	6
Satellite	5
Remote sensing	4

both large users and producers of data, and have the capacity to gather data. Researchers and farmers come next, which also makes sense since researchers are primarily looking for data to complete their research, while farmer's data is valuable to almost all within the food system. (Table 8).

The majority of respondents are engaged with more than one stakeholder group, and many engage with 2–4. Several engage with more, but only one engages with all stakeholders (Table 9).

Respondents were asked the open-ended question: "What are the key challenges your organisation faces in developing this activity

Table 8. Stakeholder groups that respondents engage with in their open data activities. Multiple choice question, respondents could choose more than one option.

Which of the following stakeholder groups does this activity primarily engage with?	
Governments	97
Researchers	88
Farmers	79
International Organisations	77
Smallholder farmers	77
NGOs	72
Citizens	58
Service providers	54
SMEs	50
Multinationals	33
Other	18

Table 9. Number of stakeholder groups that respondents engage with in their open data activities. Multiple choice question, respondents could choose more than one option.

Number of stakeholder groups	Respondents
11	1
8 – 10	28
5 – 7	46
2 – 4	58
1	1

further with respect to open data? Please share your insights in a few sentences." Respondents were encouraged to answer in their own words. Each response was individually read and analysed by a member of the GODAN Secretariat Research team. Through this process, the answers were aggregated into a format we could analyse (Table 10). For example, those who mentioned "financial issues", "needing funding", or "monetary burden" in their challenge were placed into "cost" category. The challenges are categorized by buy-in, data, resources and skills, methods, culture and other. These challenges stem from the activities listed above and can be found in the Challenges Partner Survey Spreadsheet".

The most frequently mentioned challenge was cost; many do not have the funding to begin an open data activity or to maintain one. It costs money to train in open data management and, often,

people with those skills are more expensive to employ. Managing and accessing open data is difficult as well, even if cost isn't an issue. Convincing specific sectors of the importance of open data and actually buy-in to the open data agenda is a big challenge as well.

Table 10. Challenges of open data from analysis of open ended questions from respondents.

Resources and skills	
Cost	36
Human capacity (time, resources, skills)	11
Lack of available technology (ICT infrastructure)	9
Lack of ICT skills	9
Physical infrastructure	5
Literacy (data and otherwise)	4
TOTAL	74
Data	
Data access	17
Data quality	12
Data availability/How to find the correct data	11
Readiness of datasets to help decision makers (including machine-readable)	6
Data privacy	5
Lack of data infrastructure	5
connections with other data infrastructure	2
Data collection	2
Data ownership	2
Authenticity and clarity of data	1
Data storage	1
TOTAL	64

Resources and skills	
Buy-in	
Lack of government and political interest/buy-in, and lack of policy	20
Lack of private sector interest/buy-in, business case for open data	7
Lack of interest from other sectors	7
Lack of farmer interest/buy-in	5
Lack of researcher/academic interest/buy-in	5
TOTAL	44
Culture	
Overcome culture of private data	13
Lack of awareness/knowledge	10
Lack of trust among stakeholders/Multi-stakeholder collaboration	9
Low incentives for open data motivation	8
TOTAL	40
Methods	
Data standards (lack of appropriate, difficulty using)	7
Lack of sustainable approach to releasing and publishing open data	2
How to benefit smallholder farmers?	1
TOTAL	10
Other	
What data shows "should" happen, doesn't.	1
Too many open data initiatives	1
Lack of a truly global database	1
TOTAL	3

Conclusions

The partner survey has become a strategic resource for the Secretariat to develop the GODAN initiative towards; 1- geographic, topical focus and stakeholder group representation and 2 - stakeholder needs in terms of support (capacity building, providing resources, building advocacy). The GODAN initiative and its partners provide inspiration, show best practices and connect with partners beyond the current network. The purpose of the GODAN Secretariat is to facilitate partnerships and provide our partnership network with resources to advance the open data agenda and this publication is one of those resources.

The survey has a balanced representation by region of those who have answered the survey and our partnership network as a whole. However, our partnership network is heavily skewed towards Africa, Europe and North America. GODAN hopes to improve our partnership network representation globally to have equal representation and holistic understanding of the state of open data activities in agriculture and nutrition. In order to do this, the GODAN Secretariat could adjust our advocacy messaging to more specific regional audiences.

The survey is skewed towards universities and research institutions completing the survey compared to its distribution in the Partner Network. This also makes sense as to why research is a primary activity output (as listed in Table 7). Increased government input to the survey would be tremendously useful, especially since lack of policy and lack of government buy-in is a significantly mentioned challenge and a number of our partners express the need for assistance in convincing governments why open data is important. Together with Open Data Charter, GODAN is in the process of developing an Agriculture Open Data Package for governments[7] to help with this goal.

The use of data in gender equality is very much underrepresented in the GODAN partner network. While 42 respondents stated they are working on gender balance, it wasn't clear if any respondents open data activities focused on gender, neither as gender data used or provided, nor empowerment of women and girls. Since researchers have concluded that an equal gender balance is essential for positive sustainable agricultural and nutrition outcomes[8], the absence of any gender-focused activities is unfortunate. We must focus on not only improving our gender data representation within GODAN, but also emphasizing the message that partners must integrate gender considerations into their work.

Although GODAN aims to focus on agriculture and nutrition, the number of nutrition specific focused initiatives is low. However, a large number of activities focus on both agriculture and nutrition which is a link that spans the supply chain and connects various sectors. When we consider the data supply chain, and the movement of a certain data point as it provides information from one stakeholder to the next, we have a large number of activities that can help facilitate this work.

Based on the results of Table 7, a large number of partners focus on applications of data instead of data infrastructure, and lack of data infrastructure is a challenge. The need for data to create applications may drive the development of data infrastructure, however, data infrastructure must develop alongside the applications as well so they can constantly inform each other. Interoperability is crucial especially when working at a global scale. Currently, existing data infrastructures seem to be in their infancy, as many pre-requisites such as common vocabularies, ontologies and exchange standards require a collaborative effort from the user community. While some sectors are developing fast (eg. genomics[9,10], precision agriculture[11]) others are developing much slower or have not even started to think about the prerequisites for data infrastructures.

The most common challenges, collectively, are the ones actually related to data. How to find it, access it, manage it, store it, organize it, keep the sensitive data secure, and ensure that the rightful owners are ensured the benefits. GODAN is already focusing on these issues through our Responsible Data and Data Ownership pieces[12,13], and various working groups[14] on the subject. However, we realize that these challenges are not simple and will have many solutions according to the context. No respondents' activity is focusing on data ownership, or FAIR data, however, through personal communication with partners who did not answer the survey, GODAN does know other partners, such as DTL and the Engine Room, are working with FAIR data.

A common challenge was the culture of opening data and the shifting of mindset to integrate data stewardship into the workflow of each sector and prioritizing effective data governance. Many people are not aware of open data or and even if they do, they do not have a specific and trusted path to follow to implement good (open) data stewardship into their work. Funding schemes are changing and may even evolve further to take these components into account. And the way research is performed much of the outcomes need to realign to the needs of a global data ecosystem. The GODAN partner base could be leveraged to determine some solutions to these issues and find support for good data stewardship.

Capacity building, and empowering partners with the tools they need to act, is one of the most effective actions that GODAN can do. The GODAN Capacity Building Working Group[15] is focusing on training for open data advocacy, publishing of open data, and developing business models for open data.

Cost is the most listed challenge and is linked to data governance, management, and human capacity. Funding for open data work as well as research and practical solutions on sustainable business models for open data should be an essential component of the open data agenda.

At GODAN, we would like to utilize our partner base to engage with them as much as possible. Now that, through the survey, we understand our partner's needs and challenges better, we can work, alongside other initiatives, to equip partners with tools they need, empower them to achieve their goals and overcome challenges, and convene partners together both in workshops and online. Our common results and output can help others to learn from the GODAN partner network, to build on our research, and help

foster collaboration, trust, and innovation to combat world food insecurity, develop sustainable agriculture and provide safe nutritious food.

Data availability

Dataset 1: Anonymized Partner Survey Spreadsheet. Directly downloaded from Survey Monkey. DOI, 10.5256/f1000research.13044.d189522[16].

Dataset 2: Challenges Partner Survey Spreadsheet. Directly downloaded from Survey Monkey. DOI, 10.5256/f1000research.13044.d189523[17].

Supplementary material

Supplementary File 1: BQ sample, directly downloaded from Survey Monkey. Survey sent to participants, which was tested by an author.

Click here to access the data.

Competing interests

Both authors of the publication are employees of the GODAN Secretariat.

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Open Peer Review

Current Peer Review Status: ❓ ❓

Version 1

Reviewer Report 13 February 2018

❓ **Joel Gurin**
Center for Open Data Enterprise, Washington, DC, USA

The study of open data and its application has relied largely on case studies with relatively little quantitative survey work and analysis. From that perspective, this GODAN survey is a step forward and a useful contribution to the literature. However, the authors' report seems to miss some important opportunities to analyze data that they appear to have gathered through their questionnaire.

The study design is methodologically sound. The survey instrument is straightforward and clear, and the response rate (over 50%) is good for this kind of survey in this field. While the authors spend some time discussing the differences between the distribution of respondents and the distribution of all GODAN partners - both regionally and by sector (government, private sector, etc.) - those differences in fact appear to be fairly minor (with the caveat that I am not a statistician). So the survey was well designed and got a good overall response that represented GODAN's constituent groups fairly.

That said, the analysis and conclusions are disappointing. The data presented are largely descriptive of GODAN partners' activities, without shedding much light on how GODAN can better help these partners achieve their goals, which is the stated purpose of the study. There are some interesting findings, which the authors note: An apparent lack of attention to gender and nutrition per se, which may show a need for better strategic communication on these issues, and the clear indication that cost is a barrier to instituting open data programs. (This last may seem obvious, but the cost of open data programs has been a subject of some debate in the community working to apply open data for development.) However, most of the analyses presented are unsurprising and not as illuminating as they could be.

Some further work could remedy these shortcomings. It appears that the authors could mine some of their own data more deeply.

A critical question for open data in every area, including agriculture/nutrition, is to identify exactly what kinds of datasets are most valuable and measure the impact of applying that data. In fact, GODAN has recognized the need to help its partners focus on key datasets, and the open data package in beta (reference 7) is designed to do this. The questionnaire used in this study (presented in a supplementary file) had two useful questions at the end about the perceived impact and potential impact of data from

different sources. The authors should present findings from those questions, both by supplying the underlying data (which appears to be missing) and their analysis of its meaning.

In addition, the authors could make an important contribution to the literature by mining their partners' responses for concrete examples of agriculture and nutrition open data applications. Programs such as the Open Data 500 and the Open Data Impact Map have created databases with hundreds examples of open data projects in all sectors. The authors must have collected a number of valuable examples through their survey, but don't seem to have made that information accessible in an easily usable form. If they could do so, these other programs would be able to integrate their findings and improve the knowledge base for this information.

Finally, the literature review is not adequate: Almost all the sources cited are GODAN's sources. The authors should provide a richer context by citing and discussing key sources on open data impact, cost analyses, studies of open data for development, and analyses of trends in applying open data for agriculture and nutrition.

In sum, this is a useful study that seems to have collected more data than the authors have analyzed and reported on. Additional work to mine the data and present it in context would make this a stronger and more valuable contribution.

Is the work clearly and accurately presented and does it cite the current literature?
Partly

Is the study design appropriate and is the work technically sound?
Yes

Are sufficient details of methods and analysis provided to allow replication by others?
Partly

If applicable, is the statistical analysis and its interpretation appropriate?
I cannot comment. A qualified statistician is required.

Are all the source data underlying the results available to ensure full reproducibility?
Partly

Are the conclusions drawn adequately supported by the results?
Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Open data, with focus on its use in development and for business applications

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Reviewer Report 30 January 2018

? **Karel Charvat** iD

Czech Centre for Science and Society, Prague, Czech Republic

Scientific paper "Global Open Data in Agriculture and Nutrition (GODAN) Initiative partner network analysis" addresses important aspect of Open Data in Agriculture and Nutrient. It describes and analyses survey, which was provided by GODAN among its members. It give overview about collection and utilisation of Open Data by GODAN member. It give basic statistic of different types of GODAN members and also their role in Open Data Chain. From this point of view review is well provided.

What is missing is to put this paper into broader content. In some parts it has more form of reports, then scientific paper. Analysis of literature is relatively poor and it is mainly focused on previous GODAN analysis without clear reference. There are also mistake in links from text to references (more in end of paper).

There exist number of research activities focused on Open Data for Agriculture and Nutrient, but the results of review are not compared with this research. Due near focus only on interpretation of survey, there are missed information about some global initiatives like for example GEOSS (which cooperate closely with GODAN) and which is partly focused on Open Data for Agriculture. What is also missing in survey is focus on type of data. This is important due the fact, that for example satellite data (Landsat, Sentinel) are now currently biggest source of Open Data for Agriculture, which are broadly used.

Statistic are well elaborate, but in some cases samples are relatively poor and it could be also influenced, that samples are taken only from GODAN members. But on other side is clear, that it is not easy to collect such information.

Probably will be also good to mentioned in article question of data privacy. It is partly addressed in Conclusion, but without clear explanation. It is clear that not all data could be open due privacy, but it is not mentioned clearly. In relation to this I would like also recommend to compare open data and shared data. This play important role for example in Precision Agriculture, where number of applications is based on combination of Open Data (for example satellite, and data, which are shared like private farming data).

Conclusion is analysing results of survey and presenting importance of analysis, for other GODAN activities. However is a little generic, it will be good to stress some important activities and source, which could be used for future for GODAN activities, and also how better target activities in certain regions.

In conclusion about data infrastructure (page 8) is not clear if discussion is about infrastructure for Open Data or generic Data Infrastructure. From the text seems, that more about generic data infrastructure.

There are in conclusion also wrong links to references. For example reference 11, which is in text related to Precision Agriculture is focused on previous Genomic. Then Reference 12 related to Precision Agriculture is mentioned in text in relation with Data Ownership (please check this). It is also not clear, if the reference 12 "Precision agriculture and the future of farming in Europe Scientific Foresight Study" is really relevant to the topic of Data Infrastructure, resp. Open Data Infrastructure.

I would like recommend to modified this article and put it into broader content of Open Data for Agriculture and Nutrient and also clarify some not clear statement in Conclusions.

Is the work clearly and accurately presented and does it cite the current literature?
Partly

Is the study design appropriate and is the work technically sound?
Partly

Are sufficient details of methods and analysis provided to allow replication by others?
Yes

If applicable, is the statistical analysis and its interpretation appropriate?
Partly

Are all the source data underlying the results available to ensure full reproducibility?
Yes

Are the conclusions drawn adequately supported by the results?
Partly

Competing Interests: No competing interests were disclosed.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

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