



Brussels,

## REVIEW REPORT

<b>Grant Agreement (GA) number:</b>	687607
<b>Project<sup>1</sup> Acronym:</b>	WAZIUP
<b>Project title:</b>	Open Innovation Platform for IoT-Big Data in Sub-Sahara Africa
<b>Type of Action:</b>	RIA
<b>Start date of the project:</b>	01/02/2016
<b>Duration of the project:</b>	36
<b>Name of the primary coordinator contact and organisation:</b>	Abdur RAHIM (CREATE-NET)
<b>Period covered by the report:</b>	from 01/02/2018 to 31/01/2019
<b>Periodic report:</b>	Final
<b>Date of first submission of the periodic report (if applicable):</b>	
<b>Date of latest version of Annex 1 to the GA (Description of the Action - DoA) against which the assessment is performed</b>	23/11/2018
<b>Date of meeting with consortium (if applicable):</b>	06/03/2019
<b>Name(s) of monitors assisting in the project assessment (if applicable)</b>	ELDERT VAN SCHAGEN Muthoni MASINDE Marco Zennaro
<b>Name of Project Officer drafting the report:</b>	Jorge SANTOS

<sup>1</sup> The term ‘project’ used in this template equates to an ‘action’ in certain other Horizon 2020 documentation

## 1. Overall assessment

<b>Overall assessment</b>
Project has fully achieved its objectives and milestones for the period.
<b>Significant results linked to dissemination, exploitation and impact potential</b>
<p>Project will likely provide results with significant immediate or potential impact in the next reporting period (even if not all objectives mentioned in the Annex 1 to the GA were achieved).</p> <p>The project achieved all of its objectives and has set a firm basis for improve the food production by using IoT in agriculture and aqua culture. The results of cattle rustling are promising. The project has progressed well in the last reporting period. It has been particularly successful in the outreach activities, with more and more training and dissemination. The online catalogue has been improved and is very useful for practitioners in this field.</p> <p>The hardware and networking aspects of the project as stated in S&amp;T-Obj1 and S&amp;T-Obj2 were met. The sensors selected/adapted for the project as well as communication /networking infrastructure were evaluated for the purpose of the Project. However, given that this is the final phase of the project, it is worth noting that the fact that the sensor devices (and their components) are largely imported from outside the Sub-Saharan Africa, the cost of target end-user application will still remain uneconomical. Empowering the Sub-Saharan African countries with the skills and resource of assembling their own sensors is the ultimate solution.</p> <p>The small scale (less than 50 sensors in total) installation hampered effective evaluation of many aspects of the Project such as the impacts of the applications in a larger scale. Further, the small real-life data collected made it difficult to assess the robustness of the Open IoT testbed as well as the Open Big data management and the advanced analytic applications platform.</p> <p>Given the involvement and full-time participation of the institutions in 4 SSA countries (Senegal, Ghana, Burkina, Togo) in the Project, there is potential of up-scaling the end-user applications and redressing this data gap.</p>
<b>General comments</b>
<p>The project addressed all recommendation from the last period and exceeded expectations in number of views to their training material, views on how to build IoT devices. All prototypes are working and to have been integrated into the business processes of the agri-and aqua culture businesses.</p> <p>The 3-year innovative (and ambitious) journey of creating an IoT Platform for Sub-Sahara Africa by WAZIUP seem to have achieved significant results which the participating institutions can take to the next level of implementation. Two main shortcomings of the deliverable of the WAZIUP would have to be addressed:</p> <ol style="list-style-type: none"><li>1. Sub-Saharan African countries reliance of sensors devices from outside the continent</li><li>2. The limited data (resulting from very small number of sensors) collected during the life of the Project. The deployment of devices and gateways has been limited to less than 100. We believe that for such a long-term project this number is quite disappointing. IoT reports talk about billions of devices and testing the feasibility of an idea on less than 100 is not in line with these numbers.</li></ol> <p>Some minor comments:</p> <ul style="list-style-type: none"><li>• In D3.5, the reference and user manual referred to on page 7 is not on the website</li><li>• The Dashboard should be made to open in a new window and the viewing of the various deployed sensors should be improved</li><li>• Authenticating (e.g. through an email/phone number verification) of new users and new sensor addition should be added</li><li>• Page numbers should be included in D4.5 and the the phrase: ‘manageable price’ (see page 16) elaborated.</li><li>• Most URL links in D5.1 are not active - e.g. • <a href="http://ana.sn/">http://ana.sn/</a> does not work; neither does <a href="http://www.kumahfarms.com/">http://www.kumahfarms.com/</a> - why not make these part of the main website? Besides, • The URL: <a href="https://aquafishcrsp.oregonstate.edu/africa-project-ghana-tanzania">https://aquafishcrsp.oregonstate.edu/africa-project-ghana-tanzania</a> links to a USAID Project</li><li>• The Final Report (D7.5) is presented in form of a poorly scanned book/publication - why not provide the original pdf file?</li></ul>
<b>Recommendations concerning the period covered by the report</b>
All recommendations of the last period have been addressed, It is recommended to accept all deliverables. Most of the work planned for the Year 3 of the Project was carried out as per the objectives. Most of the recommendations made at the end of Year 2 were also implemented.

The advanced data visualization and analytics, using the Predictive analytic and machine learning techniques (T3.3) seem to have been affected by the lack of adequate data generated from the Project's MVPs.

### **Recommendations concerning future work, if applicable**

A report on lessons learned would help future projects like this to cope with local African environment.

Given that the Project cycle has come to an end, it is recommended that participating organizations continue supporting and extending the MVPs. Data should be collected and used to evaluate the impacts and robustness of the IoT platform in its totality

Extending the implementation of the IoT Platform to East Africa (e.g. Kenya) and Southern Africa (South Africa in particular) has great potential of creating greater impacts.

Keep up with the outreach activities and the online material. Increase the number of devices and gateways. Make sure the communities you reached and still connected when the project will be over.

## 2. Objectives and Workplan

<b>Is the progress reported in line with objectives and work plan as specified in the DoA? If there are significant deviations, please comment.</b>	Yes
The D7.4 report 30-01-2019 gives a very good overview of the status of the project and all deliverables. At the website <a href="http://www.waziup.io/documentation/">http://www.waziup.io/documentation/</a> , all documents are openly published. The objectives of the project for the period have been achieved. The project as a whole has been making very good progress. Some comments: 1. Economical Impact Analysis (D4.6) - more scientific (with actual numbers and percentage change) would be more useful. The qualitative answers from the selected respondents does not provide a clear 'impact analysis' 2. The proposed innovation business and financial models are highly theoretical and are not in touch with the reality of the viable business models that are commonly used in SSA - especially SSA's SMEs.	
<b>Are the objectives of the project still scientifically and /or technologically relevant?</b>	Yes
It is scientifically and from the technology relevant and innovative. The whole project has come together now, the devices, processing and presentation to the end user. ALs integration of weather forecast, rain etc. is now available.	
<b>Are the critical implementation risks and mitigation actions described in the DoA still relevant?</b>	Yes
All risks have been addressed. Especially power consumption took some time, but now ultra-low power devices are available.	
<b>Have the pilots/case studies started to showcase innovative results as described in the DoA?</b>	Yes
All pilots are successfully completed. The main shortcoming of the pilot is the small number of sensors' deployment, otherwise the results would be innovative. There has not been any effort to ease the planning of gateways.	
<b>Have the ethics related deliverables and/or requirements due for the current period been adequately addressed and approved?</b>	Yes
Yes, the ethics and compliance are built in into the products and infrastructure created for this project.	
<b>Have the comments and recommendations from previous assessments been taken into account?</b>	Yes
All comments and recommendations from previous sessions have been implemented or addressed.	

### 3. Impact

<p><b>Does the work carried out contribute to the expected impacts detailed in the DoA?</b></p>	<p>Yes</p>
<p>Within the WAZIUP project, but also outside this project, it is taken onboard by universities and commercial companies as an example on how to use IoT devices and present the results to the end user.          Scientific data on the impacts is not present.          The online catalogue is innovative in the way it shows products and relates them to applications and areas. This has been very innovative.          The online material production has not been particularly innovative as it has used the traditional means (youtube, github, etc) with no innovative solution.</p>	
<p><b>Does the work carried out follow the plan detailed in the DoA to enhance innovation capacity, create new markets opportunities, strengthen competitiveness and growth of companies, address issues related to climate change or the environment, address industrial and/or societal needs at regional level or bring other important benefits for society? Give information on the relevant innovation activities carried out (prototypes, testing activities, standards, clinical trials) and/or new product, service, reference materials, process or method (to be) launched to the market, if any.</b></p>	<p>Yes</p>
<p>The prototypes, the documentation, the programs (computer code etc.) is open source and available to the society.</p>	
<p><b>Does the work carried out contribute towards European policy objectives and strategies and have an impact on policy making?</b></p>	<p>Yes</p>
<p>Yes, using IOT devices and integration into the agri and aqua culture business processes will help Africa, to produce their own food and grow into a more stable business partner for Europe.</p>	
<p><b>Does (or will) the work carried out have an impact on SMEs?</b></p>	<p>Yes</p>
<p>Yes, as it is based on low cost devices that can be easily acquired by SMEs in Africa.</p>	
<p><b>Have the beneficiaries aimed at a gender balance at all levels of personnel assigned to the action? If beneficiaries could not achieve the balanced participation of women and men in their teams despite active recruitment efforts, have the reasons been explained in the periodic report?</b></p>	<p>Partially</p>
<p>Only once the term "gender" has appeared in the final report. I don't think there has been much attention to gender balance.          At the Project's technical team level, most top level (Researchers) people are male. For example, out of the 34 researchers, there are only 6 women.</p>	

#### 4. Implementation

<b>Has the project been efficiently and effectively managed?</b>	Yes
Yes, all partners seem to have worked equally. This shows an overall good management of the team. All the WP have progressed in a balanced manner. The budget has been managed correctly.	
<b>Is the management of the project in line with the obligations of beneficiaries (including ethics and security requirements, risk and innovation management if applicable)?</b>	Yes
Yes, it is in line with the obligations of all the beneficiaries.	
<b>Is the contribution of each beneficiary in line with the work committed in the DoA? (applicable only to multibeneficiary projects)</b>	Yes
Yes, there is a long list of websites with scientific publications, gitHub's with the open source code. The waziup website itself contains a long list with references to all training material, YouTube training movies and overviews of the success of the prototypes.	
<b>Have the beneficiaries disseminated project results (foreground) in scientific publications as planned in the DoA, including the deposition of publications in open access repositories? Has the dissemination plan been updated? Do they include a reference to EU funding?</b>	Yes
All social media are well used, Youtube, Facebook, linkedn, Whatsup, mail, newsletters, websites etc. Yes, as the projects are openly available in form of source code and the papers are readable with no fee.	
<b>Have the beneficiaries disseminated and communicated project activities and results by other means than scientific publications (social media, press-release, the project web site, video/film...) as planned in the DoA? Do they include a reference to EU funding?</b>	Yes
They have disseminated the activities using social media, press-releases and videos.	
<b>Has the plan for exploitation of results, in particular as regards intellectual property rights, been appropriately planned and executed, as described in the DoA?</b>	Yes
There are already SME's, selling (part of the) product and offering services to use IOT devices in agri and aqua culture to help farmers to improve their production.	
<b>Has the dissemination and exploitation plan been appropriately executed and updated? Give details if an update of the D&amp;E plan is needed.</b>	Yes
Yes, the dissemination has been executed correctly.	
<b>Has the Data Management Plan (DMP) been appropriately drafted and, if applicable, executed? Give details if an update of the DMP is needed.</b>	Yes
Yes it has been drafted.	
<b>Have the proposed institutional changes been appropriately promoted?</b>	Not applicable

**5. Resources**

<b>Were the resources used as described in the DoA and were they necessary to achieve its objectives? If there are deviations from planned budget, have they been satisfactorily explained? Have they been used in a manner consistent with the principle of sound financial management, in particular regarding economy, efficiency and effectiveness?</b>	Yes
Use of resources, (People, money and time) have been properly managed and only minor deviations can be seen. But overall, the project is executed within the budget and time.	

## **Annex 1 - Expert's opinion on deliverables**

<b>Del. no.</b>	<b>Deliverable name</b>	<b>Status</b>	<b>Comments</b>
D2.4	WAZIUP IoT catalogue and hardware platform	Accepted	The IoT catalogue has grown a lot in terms of quality and quantity. It is a very useful tool and one of the most successful aspects of the project.
D3.2	Proactive, prescriptive and descriptive applications and decision-making mechanism	Accepted	Despite the small numbers, the report addresses the three applications.
D3.5	Applications platform implementation and performance assessment	Accepted	The technical description is complete and can be used to run the platform.
D4.5	Results of MVPs deployment and technical validation (Final version)	Accepted	The numbers of the deployed devices is really limited, and this is a clear issue. But the report shows that devices have been tested and lessons have been learned from the testing.
D4.6	Economical Impact Analysis	Accepted	It is very difficult to address the impact of a project such a WAZIUP. This report has some useful information and it quite well written.
D5.1	Report on farmer's engagement, promotion and onsite trainings	Accepted	The numbers of farmers involved is someway limited, but the results are interesting.
D5.2	Propose innovation business and financial model	Accepted	The sustainability issue has been analyzed, and this is quite unique for IoT projects in developing regions.
D6.3	Final report on dissemination, communication and exploitation	Accepted	The dissemination plan has been successful in reaching a good number of technical and non-technical people. This is one of the successes of the project.
D7.4	Third Periodic Report	Accepted	This is a complete report and addressed some of the comments of the previous period. It is well done as a final report.
D7.5	Final Report	Not submitted	I could not find D7.5

## **Annex 2 - Expert's opinion on milestones**

<b>Miles. no.</b>	<b>Milestone title</b>	<b>Achieved</b>	<b>Comments</b>