Point 1:
Line 33: non-point (and not nonpoint) as in the rest of the text.
Response 1: Corrected to non-point.
OK

Point 2:
Lines 35-36: even if the reference 7 is relevant, in my opinion it is misleading ... as stated by the authors "nitrogen pollution has been identified in the large portion of water bodies" therefore it cannot be defined as an exclusively concern in the saltwater management. Moreover, as the authors will certainly know, the major sources of nitrogen come from agricultural activities, and I expected to find some references about it, which I did not find;
Response 2: (Therefore, nitrogen became a primary concern in stormwater management) [7]. I meant stormwater not saltwater, it is software checker error. Line 80-82: Nitrogen represents a highest rated nutrient in stormwater runoff [7].
IF THE AUTHORS WANTED TO SAY WHAT THEY WRITE NOW (stormwater INSTEAD saltwater), I BELIEVE THAT REFERENCE [7] IS NOT APPROPRIATE; THIS REFERENCE, IN FACT, REFERS TO THE "dead zone spreading in world ocean" .. AND COMES TO THE CONCLUSION THAT "nitrogen is clearly the problem in the marine waters of the gulf of mexico". PLEASE CLARIFY


Nitrogen concentrations in stormwater differ according to land use activity such as residential land, parking lots, highways, commercial use areas and agricultural lands [6]. I added agricultural lands in the text as well as in Figure 1 agricultural land ref [38] (M. Lang, P. Li, and X. Yan, “Runoff concentration and load of nitrogen and phosphorus from a residential area in an intensive agricultural watershed,” Sci. Total Environ., vol. 458–460, pp. 238–245, 2013. CERTAINLY BETTER, BUT I WOULD DEEPEN THE "AGRICULTURE SOURCE"
I deepened on the agricultural source and rewritten this part (Actually, higher concentrations of nitrogen are found from emissions and fluid leaks from vehicles (e.g. high density traffic area and highways, and urban areas) and agricultural activities. The development of agricultural activities ultimately results in a greater load of sediment and nutrient accumulating in water bodies. In the agricultural lands, pollution is primarily caused from fertilizers, herbicides, pesticides and insecticides, which are rich by nitrogen. I have cited this reference about the nitrogen concentration from runoff in the agricultural land (J. G. Han, Z. B. Li, P. Li, and J. L. Tian, “Nitrogen and phosphorous concentrations in runoff from a purple soil in an

Point 3:
Line 47: Correct the section title with 1.1 and not 2.1.

Response 3: Corrected to 1.1 (1.1 Stormwater Runoff Characteristic).
OK

Point 4:
Lines 66-68: The typical pollutants characterizing stormwater runoff (TSS, N, P, BOD and COD) are mentioned, but the sources of these pollutants are not described, which could be especially useful for a review and for readers, particularly in the choice of the most appropriate BMP or LID (beyond the bioretention system here analysed).

Response 4: The source of pollutants is added: Dissolved pollutants include nutrients, heavy metals, and hydrocarbons and mainly result from emissions, fluid leaks from vehicles, and agricultural operations [25]. Pollution may occur by direct runoff, or by infiltration through the root zone then discharge to surface water [26].
The pollutants corrected to:; There are typical pollutants characterizing stormwater runoff, the most common pollutants are, total suspended solids (TSS), nutrients including total nitrogen (TN), ammonium-nitrogen (NH₄-N), nitrate-nitrogen(NO₃-N), nitrite-nitrogen (NO₂-N), total phosphorus (TP), and orthophosphate (PO₄³⁻) [27]. The classification of pollutant load according to Water Quality Standards [28,29] is shown in Table 1. There are five classes, class I is clean water, class II is moderately polluted, class III is heavily polluted, class IV excessively polluted, and class V is extremely polluted.
CERTAINLY BETTER
OK

Point 5:
Lines 75-76 and Figure 1: I suggest inserting an explanation of the sources of each nitrogen pollutant both for completeness of the revision and to better clarify the graph shown in the Figure 1;

Response 5: The explanation of the sources added: Nitrogen concentrations in stormwater differ according to land use activity such as residential land, parking lots, highways, commercial use areas and agricultural lands [6] as shown in Figure 1. Higher concentrations of nitrogen were found from emissions (e.g. high density traffic and commercial areas) and agricultural land [30].
*Figure 1 changed.

I DON'T SEE BIG CHANGES IN THE FIGURE COMPARED TO THE ORIGINAL ONE, APART FROM THE ORIENTATION OF THE TEXT AND THE ADDITION OF "AGRICULTURAL LAND"; HOWEVER I FIND IT MORE SUITABLE IN REFERENCE TO WHAT IS ADDED IN THE TEXT.
MAKE UNIFORM THE REFERENCES IN FIGURE1:
- EITHER ALL IN BRACKETS OR ALL OUT.
- ALSO JOIN THE n OF THE REFERENCE TO EACH OF IT, AS FOLLOWS (author, year; [n ref])
I put all in brackets and joint the no of ref to each as (author, year; [n of ref]) I think this issue from the journal formatting because they make it as pdf. In my previous original draft 9word version) all author, year; [n is already there.

**Point 6: Section 1.2 and 1.3:** In general, these sections (1.1, 1.2 and 1.3) should be improved; many concepts are poorly written and exposed in a confused and approximate way ... often the same concepts are repeated in different parts of the text, citing studies without a common thread.

**Response 6:** Sections (1.1, 1.2 and 1.3) have been rewritten.

**HONESTLY I DO NOT FIND SUBSTANTIAL DIFFERENCES IN THE CONTENT, APART FROM A BETTER EXPOSURE OF THE ARGUMENTS.**

I have rewritten some parts of these sections

**Point 7:** Line 80: Correct the section title with 1.2 and not 2.2;

**Response 7:** corrected to 1.2

**Ok**

**Point 8:** Lines 82: I think it’s necessary to insert some more References (over the 35 and 36);

**Response 8:** Line 88 the description of figure 1, the missing references [31-38] were added. Then continued in Line 91: references [39,40].

**THE AUTHORS MISUNDERSTOOD MY COMMENT. I DID NOT REFER TO THE N OF THE REFERENCE IN THE CAPTION OF FIGURE 1, BUT TO THOSE IN THE TEXT (FIRST TWO LINES OF SECTION 1.2): I THINK IT IS APPROPRIATE TO ADD SOME MORE REFERENCES IN ADDITION TO THE CURRENT TWO [39, 40] More references [1,6,21,23,32] added to [39,40] as you suggested.**


**THE AUTHORS DID NOT CONSIDERED THIS COMMENT**

This reference (T. D. Fletcher et al., “SUDS, LID, BMPs, WSUD and more – The evolution and application of terminology surrounding urban drainage,” Urban Water J. 2015, vol. 12, no. 7, pp. 525–542) is added ref n 41.

**Point 9:** Lines 86-88: The authors state that "Water quantity control is measured to curb post construction flash flood problems while erosion and sediment control is measured to minimize erosion and sedimentation problems during construction". authors should better conceptualize the distinction between "post- and during- construction" problems, that here it is not clear;

**Response 9:** Corrected Line 97-98.

**THE AUTHORS DID NOT RESPOND TO THE COMMENT BUT INSTEAD DIVERTED THE ISSUE BY DELETING FROM THE ORIGINAL SENTENCE "during construction". THE SENTENCE REMAINS EQUIVOCAAL AND UNCELEAR ... I WAIT FOR EXPLANATIONS**

The main objective in this part is only to distinguish between stormwater quantity control and stormwater quality control. Here i want to only give a simple background about both and the definition of the two functions. This paper is highlighted on the quality control part. In the previous version, my opinion was to delete “during construction” to make it more clear and to
avoid the discussion about construction and post construction which it not important and not of our concern once this paper is only consider the water quality part.

In this new version I redefined it in a simple way to make it more clear.

(S)Stormwater management could be divided into two main functions, which includes stormwater quantity control, and stormwater quality control. Stormwater quantity control is measured to curb flooding problems by facilitating detention to reduce the peak flow rate through the temporary storage and slow release of stormwater over an extended detention time. The main objective of stormwater quantity control to prevent the occurrence of flash flood. However, stormwater quality control is intended to reduce non-point source pollution problems, whereby the primary objective of stormwater quality control is to achieve good water quality standards...........

Line 95-96: The authors state that BMPs/LID solutions "also enhance pollutant mitigation by promoting water infiltration and evapotranspiration to improve water quality"...despite being known the benefits of infiltration processes for the improvement of quality, the authors should clarify those provided by ETP

The authors have not clarified what they wanted to say with “pollutants mitigation can be achieved by promoting ... evapotraspiration”. The sentence and its meaning has remained unchanged as well as the reference. The authors should clarify those provided by ETP

This is mistake in the previous version and I have rewritten this part to make it more clear and to avoid the misunderstanding and I have added more about ET.

(In these practices, flood mitigation can be achieved by promoting stormwater infiltration, storage, percolation, and evapotranspiration. Soil promotes water infiltration, storage, and percolation, while soil and vegetation together help to remove water through evapotranspiration process. In the evapotranspiration process water is transferred to the atmosphere through evaporation from the soil surface and transpiration by the plant. However, pollutant mitigation can be achieved by allowing stormwater to be treated by vegetation and soil, thereby possessing a complex chemical, physical, and biological processes)

I have deleted the previous reference 48 which is seems inappropriate and I have cited this reference (EPA, “Green Infrastructure in Arid and Semi-Arid Climates Adapting innovative stormwater management techniques to the,” Am. Recover. Reinvestment Act (ARRA), Green Proj. Reserv. 2009, pp. 1–9, 2009).

Point 10: Table 2: since the revision is not specific to the Malaysian territory, the authors should specify (not only by Reference number) that the standards shown in the Table 2 are not generalized but are only refer to Malaysia.

Response 10: For water quality standards in table 1, changed to national standard table 1 according to ref “Chemical assessment methods EU-wide environmental quality standards – chemical status National environmental quality,”

The reference of the Table1 has never been questioned..however thanks for the clarification

Ok

For table 2; Minimum Pollutant Reduction Targets in BMPs and LID was changed to new table 2; Classification of reduction targets according to LID and BMPs.

The comment has been misunderstood. Authors write "the classification of reduction targets for annual pollutants according to lid and bmps alternatives is shown in table 2 [27]." The reference n. 27 is specific to the Malaysian territory, therefore the authors should
SPECIFY (NOT ONLY BY WRITING REFERENCE NUMBER) THAT THE STANDARDS SHOWN IN THE TABLE 2 ARE NOT GENERALIZED BUT ARE ONLY REFER TO MALAYSIA.
Now corrected to (Classification of reduction target according to LID and BMPs in Malaysia) and also I rewrote the that part and make it more clear this classification is according to Malaysia.

Point 11: Line 99: I think is a journal editing problem, but I suggest moving the title of the section 2.3 to the other page. Moreover, correct the section title with 1.3 and not 2.3.
Response 11: The title of the section 2.3 corrected to 1.3 and repositioned.

Point 12: Lines 101-102: The sentence "In recent years, there has been an increasing interest in bioretention for stormwater quality treatment" needs to be supported with reference;
Response 12: Ref 49, 50, 51
IF I READ "recent years" I EXPECT TO FIND RECENT REFERENCES AND NOT:
49--1999 (20 YEARS AGO); 50--2004 (15 YEARS AGO); 51--2006 (13 YEARS AGO)

Line 109-110: The sentence “Then settling of particles, and infiltration into the subsurface zone” is incomplete;
OK; THE SENTENCE WAS RE-WRITTEN IN THE NEW VERSION AND NOW IT IS CLEARER

Point 13: Section 2 (and related subparagraphs 2.1 to 2.4), as well as section 1, is approximate and not comprehensively described; it seems that the authors have included a number of sentences citing other studies, but without following a precise logical thread, except the title of the paragraph (and not even always).
Response 13: this section has been corrected and rewritten from 2.1 to 2.4.
IN GENERAL SECTION 2, IN THIS NEW VERSION, HAS IMPROVED

Point 14: Lines 147-149: Among the factors influencing nitrogen removal the authors cite vegetation, soil filter media, N concentrations and hydraulics factors, but I believe that there are other factors to be analyzed such as: 3 - Temperature dependence [look at Blecken G.T., et al. (2007). The influence of temperature on nutrient treatment efficiency in stormwater biofilter systems; Blecken G.T. et al. (2010). Laboratory study on stormwater biofiltration: Nutrient and sediment removal in cold temperatures]
- Structural Configuration [look at Jiang et al. (2017). Experimental study of nitrogen removal efficiency of layered bioretention under intermittent or continuous operation.]
Response 14: Nitrogen removal in bioretention is always variable and mainly dependent on some factors such as vegetation, soil filter media, influent concentrations and hydraulics factors [10,64,69]. We have discussed some design factors and still there are many factors but not under designing factors. There are climatic factors and they are not of concern in this paper. In section 3. Nitrogen leaching
The effect of temperature is added (However, the temperature has also shown a clear effect on nitrate leaching. In cold areas (2 to 20 °C), the nitrogen removal was poor and leaching was observed, which increased with temperature decrease [111])

The reference is The influence of temperature on nutrient treatment efficiency in stormwater biofilter systems; Blecken G.T. et al. (2010). Laboratory study on stormwater biofiltration: Nutrient and sediment removal in cold temperatures is cited as you suggested.

REFERENCE n. 111 AND n.103 ARE THE SAME; THE REFERENCE n.153 APPEARS IN THE LIST OF REFERENCES BUT NOT IN THE TEXT

The problem solved

Saturated zone is considered a design feature to improve bioretention performance and it discussed separately in section 4. Design Features that Enhanced Nitrogen Removal, and the section has been rewritten in detail: (In some bioretention systems, the poor N removal could be enhanced by retrofitting of the saturated zone to create anaerobic conditions for effective denitrification process. It is well known that, high removal efficiency of nitrogen requires the ability of the system to provide aerobic and anaerobic conditions to ensure good removal and avoid leaching [129]......)

References 69, 87, 114, 129-133 all about saturated zone.

THE ANSWER IS CONFUSING AND DIFFICULT TO UNDERSTAND..HOWEVER THE STRUCTURE OF THE TEXT HAS BEEN IMPROVED

Ok

Point 15: Line 162: The authors, referring to Reference 61, claim that "native species are more effective than exotic ones", but - as reported below - the reference cited affirms the contrary "no scientific results can support the hypothesis that native plants or diversely-planted systems offer better performance than systems planted with fewer species or with exotic species";

Response 15: This sentence has been removed.

Ok

Point 16: Table A1: Since the aim of this Table is to summarize and evaluate the different plant species for nitrogen removal in bioretention studies, I suggest to invert the column "Site Name" with "Type of Plants used" and introduce units ( I guess are concentrations in mg/l or %).

Furthermore since the table is very broad, I would suggest not to limit the distinction only between Laboratory Studies and On-Site Studies, but I suggest to make other sub-groups (eg. by geographical area, or even better, by type of plants used), so as to be able to better compare the analyzed studies and make the table more accessible to readers;

SUGGESTION IGNORED BY THE AUTHORS

For this point, honestly I have tried a lot to do what you have suggested, I red again all those papers and I could not find any information about geographical area especially in the column studies most of the information about the geographical area is available for the lab studies only.
I used site name as sup-group for the Laboratory study. For the plant type I could not be able to put it in sub-group because all plants are different and could not find similar type to put it as sub-group.

Lines 163-166: Observations and comments made in these lines should be (also) related to the table just shown (Table A1);

**Response 16:** (% added to the table title and suggestion done.

OK FOR COLUMN INVERSION AND THE UNIT INTRODUCTION; HOWEVER I EXPECTED TO FIND IN Table A1 THE REFERENCES CITED IN THIS PART OF TEXT (SECTION 2.1) AND VICE VERSA ... INSTEAD THERE IS NO CORRESPONDENCE BETWEEN REFERENCES IN THIS PART OF THE TEXT AND TABLE A1 (EXCEPT A FEW)

More reference cited in this part corresponding to the table A1 references

Lines 167-168: the sentence “The higher biomass and better plant growth; the higher plant uptake and better nitrogen removal”, as written, does not make sense;

**THE SENTENCE IN THE NEW VERSION OF THE PAPER HAS REMAINED WRITTEN EQUAL AND WITHOUT MEANING ... IT WOULD BE MODIFIED**

This sentence corrected to (In fact, a good plant growth with the higher biomass will result in a better plant uptake and nitrogen removal)

**Point 17:** Page 6 Section 2.3: Considering the topic of the revision, I find this section too short;

Lines 224-225: the sentence “The higher the nitrogen load of stormwater discharged from the bioretention was because of nitrite and nitrate”, as written, does not make sense;

**Response 17:** Sections have been rewritten.

OK FOR RE-WRITING THE SENTENCE, BUT MY DOUBT ON THE LENGTH OF THE PARAGRAPH (8 LINES WERE AND 8 LINES ARE) REMAINS UNCHANGED

I have added more in this part.

**Point 18:** Section 4: I thought it was a paragraph more focused on the different design/construction details that influence nitrogen removal (eg length/slope of the bioretention system, stratigraphy, layer thickness)...but, apart from Line 254, I find nothing about this.

Regarding different structural configuration (as layer characteristics, packing factors etc.) please look at Jiang et al. (2017). *Experimental study of nitrogen removal efficiency of layered bioretention under intermittent or continuous operation.*


**Response 18:** This section is 4: Design Features that Enhanced Nitrogen Removal, it is about how previous work improved the removal of nitrogen by adding some features, it is not about the general design details which already discussed in section 2 including 2.1, 2.2, 2.3 and 2.4. Suction 4 has been rewritten.

**SECTION 4, IN THIS NEW VERSION, HAS BEEN IMPROVED.**

Ok

**Point 19:** Table 5: I find it useful this table but I do not find correspondence with what is written in paragraph ... I expected to find the same references or - at least - find those mentioned in the text. I would also suggest not limiting the analysis to a single study for each type of design feature but to compare different ones and/or create sub-groups;
Response 19: Table 5 combined with table 4 and discussed together as design features to improve nitrogen removal because they reflect the same meaning. The discussion was rewritten from line.

THE AUTHORS MISUNDERSTOOD MY COMMENT. I DID NOT REFER TO THE TABLE CONTENTS, BUT ABOUT THE CORRESPONDENCE BETWEEN REFERENCES CITED IN THE TEXT (SECTION 4) AND LISTED IN TABLE. HOWEVER IN THE NEW VERSION, THE PROBLEM SEEMS TO BE SOLVED

Ok

Conclusions: As the same authors state (in Lines 300-301) "more work on nitrogen transformations through bioretention system and factors affecting them needs to be explored" and I think that this review was not enough and that much more work must still be done.

DESPITE THE AUTHORS HAVE NOT REPLY EXPLICITLY TO THE COMMENT, IN THE NEW VERSION THEY EXPRESSED BETTER THE CONCEPT

Ok

Point 20: the suggestion of some references for citation


Ok

Ok