**Considerations about comments on the Attribution Paper made by participants and observers of TFS**

25 January 2019

Comments on the Attribution Paper (AP) were provided by participants and observers of the TFS. The comments are highly appreciated by the authors of the AP and were used to improve the document. Nevertheless some comments could only be adopted partially or were disregarded. Here considerations are given about how some comments have been dealt with.

*Change the word “impact” to “effect” in the title*

The word “impact” was used for consistency with the methodological framework document (GBEP/FAO 2011) as “environmental, social and economic impacts of their bioenergy production and use”.

Also the word impact is not necessarily negative – as mentioned in a comment – and may also describe a benefit.

*Change the structure of the content*

After intensive discussions by the authors and representatives of FAO, the given structure of the paper was agreed. The structure follows the scheme of (1) raising the issue of attribution, (2) providing general guidance and (3) providing specific guidance following the sequence of the indicators. The structure is considered to be logical and should be kept.

*Role of the document*

It had been mentioned that as standalone guidance document the AP does not include sufficient scientific background about the attribution issue. Now a sentence has been added that the AP is based on the methodological framework report of the GSI (GBEP/FAO 2011) and follows the “scientific basis” stated for each indicator.

The term “standalone” was initially related to the upcoming guidance document for the GSI implementation. To avoid misunderstandings the wording has been changed to “independent guidance document based on …”

In general the AP does not claim to be a scientific paper but a practical guide with reference to the framework report.

*Missing definition of “attribution”*

The term “attribution” was introduced by the TFS as a methodological issue formulated as “the challenge of how to attribute the measurement of the indicators (GSI) to the production and use of bioenergy in contrast to all other activities.” Therefore – instead of an unambiguous definition – the approach was used to explain the term with the help of problems arising in the context of the implementation of the 24 GSI (chapter 2). Attribution in that sense is a wider concept than only allocation occurring in LCA.

*Definition of “bioenergy system”*

It was commented that a clear definition of “bioenergy system” is missing. Unfortunately it is not possible to clearly define it in general terms because the related system boundaries are different for each of the 24 GSI and do not necessarily include all life cycle stages as specified by the methodological framework report (GBEP/FAO 2011).

*Use Systems of National Accounting (SNA)*

It was recommended to use Systems of Environmental Economic Accounting (SEEA) as part of Systems of National Accounting (SNA). This was done e.g. for indicator 19 “gross value added”. SEEA and SNA could be of benefit for this and perhaps other indicators if national statistical offices provide such systems and with a level of detail to separate bioenergy from other sectors. Therefore a sentence has been added in chapter 3.3 of the AP to make practitioners aware of such a possibility. Nevertheless it is known from consultancy work for Eurostat and the German Statistical Office that the level of detail does not easily support differentiation of the necessary information for bioenergy.

*Allocation by physical properties vs. economic values*

The allocation of impacts to co-products from coupled processes is an already long lasting and complicated methodological discussion in the LCA community. It can be acknowledged that allocation by economic properties better reflects the purpose of a production and sometimes is the only meaningful way of allocation. Therefore it should not be disregarded for the guidance presented in the AP. Nevertheless its disadvantage is the variability of economic values over time.

So for the specific task of the GSI – to monitor issues of bioenergy in a country over time – the variability in methodological properties is complicating this purpose. Monitoring is on safer grounds if physical properties are used for the implementation of GSI whenever possible and meaningful. This does not contradict using economic allocation for tasks with a different goal and scope.

The exact application for the AP will be double checked in the next revision.

*Amend exergy as allocation property wherever energy is mentioned*

So far it was recommended in the AP to use the energy content of products for allocation. This does not work if allocation has to be executed between material based products and energy products like electricity or heat. Then only exergy can be used as physical allocation factor. This comment was adopted for one indicator but still needs to be checked for others and incorporated if plausible in the next revision.

*Marginal allocation methods vs. absolute allocation methods*

An intensive discussion is ongoing about marginal allocation methods (also referred to as consequential LCA or substitution methods) vs. absolute allocation methods (also referred to as attributional LCA). This discussion is not regarded to be appropriate for a guidance paper of the GSI implementation. Since the methodological framework (GBEP/FAO 2011) does not apply substitution methods in their “Methodological approach” (see under Scientific Basis) of the indicators it was decided not including them in the AP.