

Assessment study of sustainable agriculture focusing on FAO-SAFA based environmental indicators

(FAO-SAFAの環境指標を利用した持続可能な農業の評価研究)

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Today, food problems are one of the common controversial global issues. On the other hand, related to the problem, "sustainable agriculture" has been defined in various ways during the last decades. Thus, in the sense of impending crisis to this large-scale and urgent problem brought the research to make a fundamental approach from the concept of "sustainability." However, "sustainable agriculture" can still be pointed out due to the lack of clear standard conditions. Which state makes agriculture a sustainable way, and what means sustainability in the case of agriculture? The study decided to proceed with work by considering an evaluation method of assessing environmental indicators that require particularly clear judgment criteria. In such case, FAO-SAFA(The Sustainability Assessment of Food and Agriculture Systems) has been used as an assessment indicator. Therefore, the research aims (1) to improve the existing rating system of SAFA more visibly (in this case, normalization was used), and (2) to verify the validity of SAFA as a tool of measuring sustainable agriculture.

The evaluation target was a soybean field from Ibaraki University, which has been collecting research data since 2002. The field was received three types of cultivated methods (Plow, Rotary, and Non-Tillage) and applied three types of cover crops (Fallow, Rye, and Hairy Vetch). By comparing nine different types of agricultural land in total, the differences between each indicator were confirmed by numerical results and finalized by the SAFA rating system.

As a result, fields with rye rated the highest in the total SAFA assessment; however, the indicators tended to be sparse. On the other hand, the other fields with a cover crop that planted hairy vetch were rated relatively higher, especially with the "Land" indicator. Finally, the fallow rated the lowest ratings most among the three cover crops due to few high ratings.

The study showed that the assessment method applied in the study was effective from the perspective of comparing different land managing systems under the same assessment condition. However, still, the study could not cover many indicators enough throughout the assessment process due to the unclear description of the SAFA assessment by the FAO. The further consideration of the utilization of SAFA would be required in the next step of the expected research.

Keywords: Sustainable Agriculture, Sustainability Assessment, Environmental Performance Indicators, Agroecology, SAFA(The Sustainability Assessment of Food and Agriculture Systems)