This study discusses and develops socio-economic scenarios for Japan that are consistent with Shared socio-economic pathways (SSPs). As the authors mentioned, the scenarios developed in the S-18 project and this study will be useful for detailed assessment of climate change impact in Japan. Besides, this paper carefully explains framework of the project, related studies, and so on, and easy to read. Thus, it is potentially an important study.

On the other hand, regarding methodology, there are many parts revisions are needed. Major comments are listed below:

Population scenarios (Section 4)

- The authors just use existing population scenario data (i.e., Japan SSP1 and Japan SS5 of NIES, 2021). Therefore, in terms of population projection, there is no novelty. Because of the reason, I am not sure if Section 4 is really needed.
- A more detailed explanation on how Japan SSP1 and Japan SSP5 are projected is needed to understand these scenarios.
- In my understanding, Japan SSP1 and Japan SSP5 provides population projection with adjustment based on their own scenarios. To clarify the influence of these scenarios on future population, it is desirable to additionally compare these scenarios with population projection without adjustment based on scenario (i.e., population under business-as-usual scenario).

LULC scenarios (Section 5)

- A building area projection model is proposed in Section 5.2. However, it is unclear how reliable and accurate this model is. It is needed to examine if the model accurately explains the relationship between accrual population and building area.
- Related to the previous comment, when projecting LULC, it is typical to estimate LULC transition matrix (e.g., a matrix whose (i,j)-th element denotes the probability that the i-th LULC changes to j-th LUCL) from past data, and use it for future projection. Such a transition matrix-based projection is likely to be more accurate and interpretable than the model assumed in this study. It is needed to explain why the authors rely on the simple model assuming linear relationship between population and building area.

Other minor comments are as follows:

- Based on the abstract, the contribution of this paper is that “we established common socio-economic scenarios designated as Japan SSP1, Japan SSP5, and status quo”. However, it is an overstatement because the authors created LULC scenarios only (regarding population scenario, existing scenarios are used).
- Figure 1: The period in the graph is 1995-2021 but the caption says "during 1995-2020"

- Line 270: areaa -> area
- Line 269: “i” seems representing mesh code rather than the number of mesh units. Please check.
- Figure 3: In the current color coding, urban areas seem uniformly orange, and it is hard to visually distinguish difference in population size in each area. A better color coding is needed to clarify population difference in each area.
- The titles of Section 5.2 “Creation of future scenarios for LULC distribution based on population data” and Section 5.3 “Future scenarios for LULC distribution based on population data” are too similar.
- In the draft, NISSP, NIPSSP, and NIPSSR, which seem to have the same meaning, appear. Please unify them for consistency.