**Table 1. Types of agroecosystem services, response variables and its categories, and moderators**

|  |  |
| --- | --- |
| 1. **Provisioning services** | |
| **Response variable** | **Categories within response variable** |
| Annual crop yield | Yield of annual crops |
| Product quality | Dry matter  Crude protein  Starch  Organic matter digestibility  Underwater weight  Diameter fraction |
| 1. **Regulating services** | |
| **Response variable** | **Categories within response variable** |
| Biodiversity | Fungi  Bacteria  Plants  Birds  Small mammals  Arthropods  Pollinators |
| Pest and Disease | Disease  Pest |
| Water quality | Nutrient concentration  Nutrient leaching |
| Soil quality/Soil fertility | SOC  Other nutrients  Other soil characteristics |
| Greenhouse gas emission | Soil N2O emission |

**Defining positive and negative effects for each of response variables:**

**1. Annual Crop Yield**

* **Positive Effect:** An increase in crop yield, meaning more produce is harvested per unit area.
* **Negative Effect:** A decrease in crop yield, meaning less produce is harvested per unit area.

**2. Product Quality**

* **Positive Effect:** Improvement in product quality, such as higher crude protein, higher dry matter content, etc
* **Negative Effect:** Deterioration in product quality, such as lower crude protein, lower dry matter content

**3. Biodiversity**

* **Positive Effect:** An increase in biodiversity, meaning more species variety and abundance in the ecosystem.
* **Negative Effect:** A decrease in biodiversity, meaning fewer species variety and abundance in the ecosystem.

**4. Pest and Disease**

* **Positive Effect:** A decrease in pest and disease incidence, meaning fewer pests or disease outbreaks.
* **Negative Effect:** An increase in pest and disease incidence, meaning more pests or disease outbreaks.

**5. Water Quality (Nutrient Concentration and Nutrient Leaching)**

* **Positive Effect:** A decrease in nutrient concentration and nutrient leaching, indicating less pollution and better water quality.
* **Negative Effect:** An increase in nutrient concentration and nutrient leaching, indicating more pollution and worse water quality.

**6. Soil Quality**

* **Positive Effect:** An improvement in soil quality, such as increased organic matter, better nutrient content, or improved soil structure.
* **Negative Effect:** A deterioration in soil quality, such as decreased organic matter, poorer nutrient content, or degraded soil structure.

**7. Greenhouse Gas Emissions**

* **Positive Effect:** A decrease in greenhouse gas emissions (e.g., CO2, N2O), contributing to less climate impact.
* **Negative Effect:** An increase in greenhouse gas emissions, contributing to greater climate impact.

Table 2. Aspects of the silvoarable agroforestry systems, moderator variables, and their levels distinguished in the 37 studies.

|  |  |  |
| --- | --- | --- |
| Aspect | Moderator variable (Explanatory variables) | Levels within moderator |
| Genetic | Tree-crop combination | Eg: Poplar-Cereal  Poplar– Legume  Apple-Cereal  Mixed -Cereal etc |
| Spatial | Alley width  Orientation  Tree density per metre square  Soil type |  |
| Temporal | Tree height  Crop season |  |
| Management | Organic and tillage  Organic and no tillage  Conventional and tillage  Conventional and no tillage |  |