**Adoption of Silvopastoral Systems: A comprehensive systematic review & bibliometric analysis of global perspectives and trends.**

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**System and practices from Agrisilviculture to Silvopastoral systems reported in the reviewed studies – Online Resource 4**

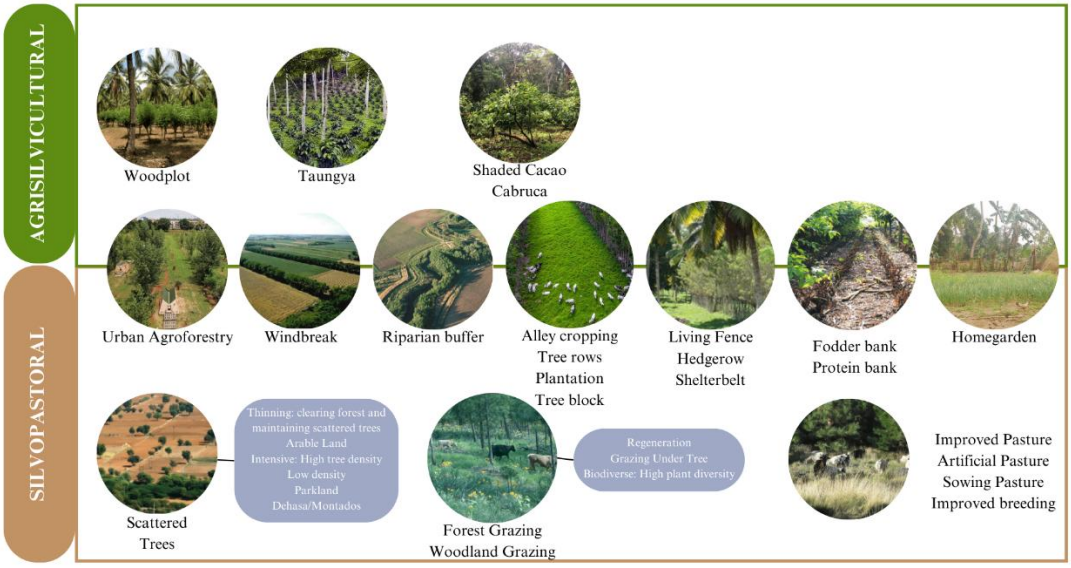


Figure ESM 4: Systems and practices from Agrisilviculture to Silvopastoral systems

As each reviewed document addressed silvopastoral systems through different lens and classifications, these systems were further grouped and classified based on the spatial arrangement of the tree component and livestock component, as well as the objective of the system (Table ESM 4)

Table ESM 4: Frequency, percentage, and average adoption of system type and studied practice.

| System_Practice | Countries | N° of reports | Percentage of reports | Average Adoption Rate (%) |
|---|---|---|---|---|
| **SPS_Riparian buffer** | Colombia (1), Mexico (2), USA (1), Canada (1) | 4 | 3.17 | 58.43 |
| **SPS_Living fence** | Colombia (5), Mexico (3), Peru (1), Brazil (1), Ecuador (1) | 11 | 8.73 | 54.59 |
| **SPS_Scattered trees** | Colombia (4), Ecuador (1), Brazil (2), Peru (1), Mexico (3), Argentina (1), USA (1), Europe (1), Africa (1), India (1) | 16 | 12.70 | 50.10 |
| **SPS_Fodder bank** | Colombia (5), Mexico (1), Peru (1), | 7 | 5.56 | 46.46 |
| **SPS_Thinning** | Brazil | 2 | 1.59 | 46.00 |
| **AS_Homegarden** | Ethiopia (1), Nepal (1) | 2 | 1.59 | 45.90 |
| **AS_Live fence** | Costa Rica (1) Ethiopia (1) | 2 | 1.59 | 45.90 |
| **AS_Parkland** | Ethiopia | 1 | 0.79 | 45.90 |
| **AS_Woodplot** | Ethiopia | 1 | 0.79 | 45.90 |
| **SPS_Alley cropping** | Panama (1), Colombia (1) | 2 | 1.59 | 45.83 |
| **SPS_Improved pasture** | Argentina | 1 | 0.79 | 45.50 |
| **SPS_Protein bank** | Mexico | 2 | 1.59 | 45.50 |
| **SPS_Tree plantation** | Mexico | 1 | 0.79 | 45.50 |
| **SPS_Artificial pasture** | Argentina | 1 | 0.79 | 45.40 |

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|---|---|---|---|---|
| **SPS_Wind break** | Colombia (1), Mexico (1), Peru (1), Global (1) | 4 | 3.17 | 45.37 |
| **SPS_Intensive** | Colombia | 1 | 0.79 | 43.00 |
| **SPS_Rotational grazing** | Argentina | 1 | 0.79 | 42.00 |
| **SPS_Sowing pasture** | Argentina | 1 | 0.79 | 42.00 |
| **AS** | Ethiopia (2), Indonesia (1) | 3 | 2.38 | 41.80 |
| **SPS_Homegarden** | Ethiopia (1), Nepal (1) | 2 | 1.59 | 41.70 |
| **Forest Grazing** | Mexico(1), USA(1), Spain (1) | 3 | 2.4 | 41.50 |
| **SPS_Tree/shrub rows** | Colombia (1), Brazil (1), Panama (1), USA (1) | 4 | 3.17 | 37.65 |
| **SPS_Hedgerow** | Global (1) Uruguay (1) | 2 | 1.59 | 37.50 |
| **SPS_Shelterbelt** | Uruguay | 1 | 0.79 | 37.50 |
| **SPS_Improved breeding** | Argentina | 1 | 0.79 | 34.50 |
| **SPS_Fodder hedge** | Colombia | 1 | 0.79 | 34.00 |
| **SPS** | Colombia (2), USA (3), Sweden (1), Argentina (1), Global (1), Panama (2), Indonesia (1) | 11 | 8.73 | 24.37 |
| **AS_Taungya** | Costa Rica (1), Panama (1) | 2 | 1.59 | 24.00 |
| **AS_Forest farming** | USA | 2 | 1.59 | 1.50 |
| **AS_Riparian buffer** | USA | 2 | 1.59 | 1.50 |
| **AS_Wind break** | Costa Rica (1), USA (2) | 3 | 2.38 | 1.50 |
| **AS_Alley cropping** | Panama, USA, Costa Rica | 3 | 2.38 | 0.50 |
| **Forest Plantation** | Panama | 1 | 0.79 | N/A |
| **AS_Cabruca** | Brazil | 1 | 0.79 | N/A |
| **AS_Dehasa** | Spain, Portugal | 2 | 1.59 | N/A |

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|---|---|---|---|---|
| **AS_Montado** | Europe | 1 | 0.79 | N/A |
| **AS_Shaded cacao** | Colombia | 1 | 0.79 | N/A |
| **AS_Tree blocks** | Costa Rica | 1 | 0.79 | N/A |
| **AS_Trees and perennial crop** | Costa Rica | 1 | 0.79 | N/A |
| **AFS** | Czech Republic (1), Ethiopia (1) Indonesia (1) | 3 | 2.38 | N/A |
| **SPS_Arable land** | Europe | 2 | 1.59 | N/A |
| **SPS_Biodiverse** | Mexico | 1 | 0.79 | N/A |
| **SPS_Forage alley** | Mexico | 1 | 0.79 | N/A |
| **SPS_High density** | Nicaragua | 1 | 0.79 | N/A |
| **SPS_High intensity** | Colombia | 1 | 0.79 | N/A |
| **SPS_Low density** | Nicaragua (1), Mexico (1) | 2 | 1.59 | N/A |
| **SPS_Meadow orchard** | Global | 1 | 0.79 | N/A |
| **SPS_Medium density** | Mexico | 1 | 0.79 | N/A |
| **SPS_Regeneration** | Brazil | 1 | 0.79 | N/A |
| **SPS_Tree block** | Panama | 1 | 0.79 | N/A |
| **SPS_Tree rows** | Colombia, Panama (1), Brazil (1), USA (1) | 1 | 0.79 | N/A |
| **SPS_Urban** | USA | 1 | 0.79 | N/A |
| **SPS_Woodland grazing** | USA | 1 | 0.79 | N/A |
| **Total** | | 126 | 100 | |

Where: *AS_* stands for Agrisilviculture; *SPS_* stands for Silvopastoral System; *AFS_* stands for Agroforestry Systems; *N/A* stands for Not Available

To further understand the codes, the systems and practices were described in further details considering the objectives and spatial arrangement of the components (Table ESM4)

Table ESM4: Systems and practices description from Agrisilviculture to Silvopastoral systems

| System_Practice | Description |
|---|---|
| SPS_Riparian buffer | Silvopastoral system designed to enhance water body and springs. Implemented close to water bodies |

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|---|---|
| SPS_Living fence | Silvopastoral system using trees/shrubs to create a living fence and divide zones |
| SPS_Scattered trees | Silvopastoral system with randomly scattered trees over the pasture |
| SPS_Fodder bank | Silvopastoral system that focuses on storage and management of fodder for livestock through trees, shrubs, and forage species. |
| SPS_Thinning | Silvopastoral system established by removing undesired trees in a field and leaving the others to establish the SPS |
| AS_Homegarden | Integration of crops and trees in a small scale usually close to the household for easier management |
| AS_Living fence | Agrisilvicultural system that uses trees/shrubs to create a living fence and divide zones (no livestock) |
| AS_Parkland | Agrisilvicultural system where trees are planted in agricultural land (e.g. orchards or cropland), but the trees are not in dense rows. |
| AS_Woodplot | Agrisilvicultural system typically maintaining woodlots or forest fragments alongside agricultural activities. |
| SPS_Alley cropping | Silvopastoral system with wide alleys in between tree rows for forage cultivation |
| SPS_Grazing undertree | Silvopastoral system usually based on natural grazing of livestock in openland trees |
| SPS_Improved pasture | Silvopastoral system designed to increase forage productivity and livestock productivity |
| SPS_Protein bank | Silvopastoral system focused on generating source of protein for livestock by planting protein-rich trees, shrubs, or leguminous plants. |
| SPS_Tree plantation | Silvopastoral system established by planting trees usually for timber commercial purposes |
| SPS_Artificial pasture | Silvopastoral system where pasture is artificially established by planting exotic or improved species of grasses or legumes. |
| SPS_Wind break | Silvopastoral system with tree rows established to prevent wind damage, usually at the borders of the productive area |
| SPS_Intensive | Intensive silvopastoral system where both the management of trees and livestock is highly controlled and managed. May involve close monitoring of livestock feeding, rotational grazing, and intensive tree management. |
| SPS_Rotational grazing | Silvopastoral system where livestock is moved between different grazing areas in a planned rotation. |
| SPS_Sowing pasture | Silvopastoral system where pasture is actively sowed and managed for maximum forage production. |
| AS | Agrisilvicultural system without any specific design/objectives |
| SPS_Homegarden | Integration of trees/shrubs and livestock in small scale farming usually close to the houshold |
| SPS_Tree/shrub rows | Silvopastoral system established by planting tree/shrubs in planned rows. |
| SPS_Forest grazing | Silvopastoral system that integrates livestock grazing in forested or semi-forested areas. |
| SPS_Hedgerow | Silvopastoral system where hedgerows (shrubs/trees) are planted to create boundaries, reduce wind erosion, or provide wildlife habitat. |
| SPS_Shelterbelt | Silvopastoral system that involves planting rows of trees along borders of fields or grazing areas. |
| SPS_Improved breeding | Silvopastoral system that focuses on improving the genetic traits of livestock through selective breeding. |
| SPS_Fodder hedge | Silvopastoral systems where hedgerows are planted specifically for livestock feed. |
| SPS | Silvopastoral system without any specific design/objectives |
| AS_Taungya | Agrisilvicultural system that integrates crops in the initial years of a forest plantation establishment for maximizing land/time use of the plot |

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|---|---|
| AS_Forest farming | Agrissilvicultural system where crops are grown under the canopy of a forest. |
| AS_Riparian buffer | Agrisilvicultural system designed to enhance water body and springs. Implemented close to water bodies |
| AS_Wind break | Agrisilvicultural system with tree rows established to prevent wind damage, usually at the borders of the productive area |
| AS_Alley cropping | Agrisilvicultural system with wide alleys in between tree/shrub rows for short duration crop cultivation |
| Forest Plantation | System dedicated to the establishment of trees. |
| AS_Cabruca | Integration of Cacao trees in native forest fragments for shaded Cacao cultivation in Brazil. |
| AS_Dehasa | Traditional agrisilvicultural system from Iberian Peninsula that integrates trees (Cork oaks or holm oaks) with pasture. |
| AS_Montado | Traditional agrisilvicultural system similar to Dehasa, practiced in Portugal. Involvess the integration of trees, particularly oaks, with livestock grazing. |
| AS_Shaded cacao | Agrisilvicultural system that integrates Cacao trees with other shade producer trees |
| AS_Tree blocks | Agrisilvicultural system where large blocks or clusters of trees are planted, typically for timber. |
| AS_Trees and perennial crop | Agrisilvicultural system where trees are integrated with perennial crops, which do not need to be replanted every year. |
| AFS | Typically refers to any farming system that integrates trees, livestock, and/or crops on the same land |
| SPS_Arable land | Silvopastoral system that uses land for crop cultivation (arable land) and tree management. |
| SPS_Biodiverse | Silvopastoral system designed to maximize biodiversity by incorporating wide variety of tree and plant species. |
| SPS_Forage alley | Silvopastoral system that focuses on growing forage crops in wide alleys between tree/shrub rows. |
| SPS_High density | Silvopastoral system with high tree density |
| SPS_High intensity | Intensive silvopastoral system where both the management of trees and livestock is highly controlled and managed. May involve close monitoring of livestock feeding, rotational grazing, and intensive tree management.. |
| SPS_Low density | Silvopastoral system with low tree density |
| SPS_Meadow orchard | Silvopastoral system that integrates orchards (e.g., fruit trees) with meadow-like areas that are grazed by livestock |
| SPS_Medium density | Silvopastoral system with moderate density of trees. |
| SPS_Regeneration | Silvopastoral system that focuses on regenerating or restoring forests, often by allowing natural regeneration of trees while integrating livestock or forage crops. |
| SPS_Tree block | Silvopastoral system where large blocks of trees are planted for timber or other forest products, but grazing or livestock activities may also occur around or under the tree canopy. |
| SPS_Tree rows | Silvopastoral system where large blocks or cluster of trees are planted, typically for timber production, and providing shade and shelter for grazing animals. |
| SPS_Urban | Silvopastoral system designed for urban areas, integrating trees, shrubs, and forage in small-scale farming withing city environments. |
| SPS_Woodland grazing | Silvopastoral system where livestock graze under the canopy of trees, promoting biodiversity while improving soil quality and forest health |