Supplementary Materials

Are mixed crop-livestock farming systems economically and environmentally performant? A global meta-analysis

Supplementary material SM1: Potential environmental and economic benefits, levers, and challenges of mixed crop-livestock systems

SM1.1. Environmental and economic benefits

Mixed crop-livestock systems (MCLS are complex production systems based on multiple interactions between their components (e.g., crops, grasslands, and animals) and offer possibilities for achieving a given production level with lower negative environmental impacts under adequate human management. Primary advantages of mixed crop-livestock systems include improved nutrient cycling and resource-use efficiency, which reduce nutrient leaching (e.g., N and P) and limit greenhouse gas (GHG) emissions. On the one hand, livestock provides manure, which can be used as organic fertilizer for crops. This helps close nutrient loops, increase soil organic matter, and reduce chemical fertilizer requirements. On the other hand, crop rotations, crop and grassland rotations, and mixed grazing can break the cycle of parasites specific to a given species, thereby reducing the use of pesticides, antibiotics, and anthelmintics. In addition, by using grasslands, crop residues, and by-products to feed animals and integrating grasslands into crop rotations, mixed crop-livestock systems could help conserve soil, protect water quality, reduce yield losses from pests, diseases, and weeds, and reduce farms' dependence on input markets. The use of home-grown feed could reduce GHG emissions from large-distance transportation of animal feed. Mixed crop-livestock systems have the potential to use less energy and have higher energy efficiency than specialized production (Clarke and Poincelot, 1996). Indeed, by decreasing off-farm feed purchases and increasing reliance on grazing and forage (which is unusable to humans), crop-livestock systems could reduce energy use and improve energy-use efficiency (Haas et al., 2001; Hoeppner et al., 2000; Zentner et al., 2011).

MCLS with mixed grazing of large and small ruminants allow for better use of grazing land, as animal species do not generally consume the same plant species at the same time. This could thus increase animal production per ha of pasture. The production gains obtained in mixed grazing through the complementary use of vegetation, improved vegetation nutritive value, and reduced parasitism could allow farmers to reduce animal density. Hence, farmers can produce the same amount of output on a given surface with fewer grazing livestock. Reduced animal density can bring environmental benefits, such as decreased GHG emissions or reduced grass consumption, which will improve soil cover and, in turn, reduce erosion (Fraser et al., 2007, 2014). It is worth noting that mixed crop-livestock systems could provide a range of ecosystem services, such as improved soil quality through crop and grassland rotations and manure use, improved water quality, and landscape heterogeneity, which favors biodiversity. Finally, mixed crop-livestock systems enable farmers to diversify their income sources, making them more resilient to economic and climatic shocks and generating economies of scope by using the same production factors for different production activities.

In summarizing these advantages of mixed crop-livestock systems, it follows that these systems can potentially achieve high levels of production, conserve natural (water, air, soil) and non-renewable resources (phosphorus, fossil energy), attenuate greenhouse gas emissions, produce ecosystem services (pollination, soil fertility, pest control), halt biodiversity loss, reduce production costs, increase farm productivity, increase farmers' income, and reduce income volatility. This suggests that mixed crop-livestock systems could potentially enable farmers to generate economic gains (income and profitability, risk sharing, income stability, production levels and productivity, production cost, resource-use

efficiency, dependence on external inputs, and dependence on public subsidies) while minimizing negative environmental impacts and providing environmental services.

SM1.2. Success drivers (levers) of MCLS

The economic and environmental benefits of crop-livestock systems depend on the proper management of their integration, i.e., the interactions over space and time among their components (crops, grasslands, and animals) (Sumberg, 2003; Hendrickson et al., 2008; Bell et Moore, 2012). This management is all the more complicated as the level of integration (or interactions) is high. Farmers, therefore, need to have a good understanding of the system to fine-tune their production strategies. Several integration levers can be managed by farmers to increase the overall performance of mixed systems. These levers can concern the production factors (land, animals, capital, and labor) as well as sales management. In other words, the management of the integration should include at least three dimensions: "farming practice management", "sales management", and "quasi-public input management".

SM1.2.1. Farming practice management

The management of the farming practices includes all the components of the farm: animals, crops, and grasslands, which involve the management of (i) crop-crop and crop-pasture interactions, (ii) crop-livestock interactions, (iii) pasture-livestock interactions, and (iv) livestock-livestock interactions (Moraine et al. 2017).

- **Crop-grassland and crop-crop integrations** are based on crop diversification. Crop diversification involves more or less complex and technical practices, such as varietal mixes, associated crops, intermediate crops, crop rotation, crop and grassland rotation, and agroforestry. Crop diversification, including cereal and forage crops, offers a wide range of feed resources for animals, enabling farms to be self-sufficient in feed. Intermediate cover crops can be harvested to increase fodder stocks for animals (Justes et al., 2012). The introduction of rapeseed can enable farms to be self-sufficient in nitrogen and protein for animals. Linen, for example, is a crop that requires little nitrogen (Labalette et al., 2011). Nitrogen can therefore be supplied by the animal unit(s) on the farm. Furthermore, wheat yields are higher when preceded by linen than by rapeseed (Labalette et al., 2011). Finally, including legumes, which can fix atmospheric nitrogen, in plots or rotations increases soil nitrogen concentrations. This enrichment benefits other crops and limits synthetic nitrogen requirements. Farmers must therefore consider their crops and grasslands as a system based on multiple interactions.

- **Crop-livestock integration** relies, for example, on the proportion of crops produced on the farm and used to feed the animals or the proportion of crop areas allocated to animal feeding. But it also concerns grazing of crop residues and cover crops, as well as the use of straw (for feed or litter). The proportion of crop area allocated to animal feeding provides a global view of crop-livestock integration in terms of area (Martel et al., 2017). However, it is important to identify which crop resources the animals consumed and how. The use of crops is often conditional on their profitability at the time of sale. So, the farmer has to choose between selling a crop and buying concentrates, or using the harvest directly for the animals? This sub-dimension also concerns the use of livestock effluents on crops and the use of by-products. Crop-ley rotations and grazing of forage crops and stubble can improve soil quality (Schut et al., 2021). Stubble grazing can reduce agrochemical inputs, control weeds and crop pests, and increase agricultural productivity (Schut et al., 2021).

- **Grassland-livestock integration** includes, among other things, the length of time the animals are grazed, as well as the proportion of grass in the ration. Livestock directly benefit from pasture production by grazing or through hay or silage consumption. Manure returns to the pastures either directly, in the form of droppings and urine, or indirectly, after being excreted, stored in the barn, and spread on the fields. The extent and duration of the grazing season determine the relative importance of direct and

indirect pasture-animal interactions. This sub-dimension also concerns the use of livestock effluents on grassland.

- Livestock - Livestock integration concerns periods when animals interact: simultaneous and/or successive mixed grazing, simultaneous and/or successive use of the same livestock buildings, etc. The presence of sheep or goats on the farm makes it possible to use poorer, less accessible areas. Mixed grazing of large and small ruminants is widely studied. In this case, the benefits of mixed grazing can vary with climate, the physiological state of the animals, grazing pressure, and the proportions of the ruminant species considered (d'Alexis et al., 2014; Minviel, 2026).

- Interactions among production and processing enterprises
On-farm processing of raw farm products may yield by-products (e.g., whey from cheese production, bran, flour, and dregs from grain processing) that can be used to feed animals. This can contribute to nutrient recycling and farm autonomy for livestock feeding.

SM1.2.2. Sales management
The chosen marketing channels (short or long), the number of customers, and the seasonality of sales are all factors that influence the farm's success. A key advantage of short distribution channels is that they allow similar distribution channels to be used for the different farm's products, enabling a wider range of products to be sold directly to consumers and thus reducing marketing costs. Having a wider range of products to sell could also enhance customer interest in local products (Vollet and Saïd, 2018). Long distribution channels are highly specialized, which makes it difficult to pool sales of farm products. The decision to sell through long distribution channels depends on cooperatives and industrial companies operating in the territory. However, when several agricultural products are sold to the same customer via a long distribution circuit, it may turn out that the farmer's strategy is to work with trustworthy partners.

A wide range of customers (cooperatives, producers' stores, direct-sales consumers) ensures that the farmers have secure outlets. This is all the more important when they have to ensure the sale of animal products from two different units (milk and eggs, or pork and beef, etc.). Indeed, while selling the different farms' products to the same customers can establish a bilateral relationship of trust and reduce transaction costs, it may also increase farmers' vulnerability by increasing dependency.

In short distribution channels, farmers generally seek to offer their customers a diversified range of products; therefore, they organize their farming activities to achieve more regular cash inflows throughout the year (Dumont et al., 2020) and to cope with market price fluctuations. However, this strategy may be constrained by differences in production cycles among farm enterprises. However, this strategy requires careful coordination of different production cycles across farms. In addition, the sale in short distribution channels is an activity in itself, requiring special skills to avoid undermining the global farm performance. Finally, sales management can facilitate farm integration when processed products sold on-farm are made from ingredients (raw material) coming from two different farm production activities.

SM1.2.3. Quasi-public input management
A quasi-public input is an input that, once acquired for one production, can provide services at a lower cost to other productions. Managing these inputs can generate economic and environmental benefits. An interesting example is meat and grain production, in which animals serve as quasi-public inputs. Animals, once purchased for meat production, provide productive services (farm manure) for grain production at virtually no cost. Integration enables the partial replacement of synthetic fertilizers with livestock manure. In some cases, farmers who combine both types of production may find it beneficial to increase their herd size in order to replace a larger quantity of synthetic fertilizers with livestock manure.

This may also concern the shared use of production factors. This is the case, for example, (i) with tractors, which can be used to plow several plots of land and distribute feed to animals, (ii) buildings that can be used simultaneously and/or successively by different animal species over certain periods, (iii) the versatility of workers and work organization, which enable the management of activity peaks and concurrent tasks, as well as the ability of workers to be involved in several farm activities (crops, pastures, animal husbandry, and marketing). Regarding the latter point, appropriate management of both crops and livestock requires greater knowledge and skills, as well as labor planning (EIP-AGRI, 2017). Work organization can limit peak workloads, improve workload distribution, and offer greater management flexibility to cope with unexpected events (Nozières et al., 2011). For instance, to avoid seasonal work peaks in crop-herbivore systems, calving and lambing periods should not coincide with sowing and harvesting. In this respect, farmers can spread calving and lambing throughout the year on dairy farms, and group calving just before or during spring lambing to make the best use of grass on beef and sheep farms (Mugnier et al., 2020). Crop and livestock farms are multi-tasking by nature. Hence, their proper management largely depends on the available workforce and each worker's skills. As such, several multi-skilled workers may be necessary to ensure the continuous management of interactions among the different components of the production system. Indeed, while some production activities may require similar skills (e.g., beef-sheep systems), others may require very different skills (e.g., meat-sheep and dairy cattle) (Mugnier et al., 2020).

SM1.3.- Implementation challenges of MCLSs

Despite the potential advantages of the mixed crop-livestock systems, their implementation can be very challenging. They rely on numerous interactions among their components, which makes these systems complex and difficult to manage (EIP-AGRI, 2017). They require high levels of management and technical skills and a double expertise (crops and livestock activities), which can preclude their adoption (EIP-AGRI, 2017). Even the recruitment of workers can be hindered by a shortage of people with expertise in both livestock and crop production (Garrett et al. 2017). In addition, given their multitasking nature, mixed crop-livestock systems could increase labor requirements. Also, a lack of labor at specific times for optimal management (e.g., seeding, detecting animals that are in heat or have health problems) can be detrimental to system integration (Schut et al., 2021). Furthermore, many of the basic grounds of these systems may be positive in one context and negative in another. This is the case, for example, with fodder crops, which can help control erosion, while erosion can also be caused by soil compaction and overgrazing (Thornton and Herrero, 2015). Similarly, they improve nutrient cycling through direct soil–crop–manure interactions, but they can also increase nutrient losses through intensive recycling (Thornton and Herrero, 2015). This calls for context-specific advice for farmers.

Income support for specialized agricultural production and subsidized insurance programs that protect farmers from ecological, climatic, and market risks discourage the adoption of mixed crop-livestock systems (O'Donoghue et al. 2009, de Gorter et al. 2015, Lark et al. 2015). Likewise, easy access to synthetic fertilizers and market failures to account for environmental costs keep production costs artificially low (Garret et al., 2020). This may give the impression that specialized systems are more profitable. Hence, policy incentives for crop-livestock integration should be enhanced (Garrett et al. 2017). For instance, while subsidies from the EU common agricultural policy encourage environmentally friendly practices, crop diversification, and the maintenance of permanent grasslands, these subsidies do not account for the level of integration between crops and animals (Garret et al., 2020).

Finally, farmers' preferences (e.g., risk tolerance and conservation attitude) and perceptions of the advantages and disadvantages of mixed crop-livestock systems, as well as resource endowments and biophysical factors such as pedo-climatic conditions, can limit their implementation decisions. Hence, farmers should have access to specific, sound technical and economic references and knowledge of mixed crop-livestock systems to facilitate their implementation. Additionally, crop-livestock integration may require finance mechanisms (e.g., credit, payments for ecosystem services, insurance) (Garret et

al., 2020) and fundamental research (e.g., genetic improvement for maximum digestibility of roughage food safety).

An MCLS operating at the regional level (i.e., between specialized farms) could help circumvent some of these challenges, but may require third-party organizations (e.g., contractors and market mechanisms) to facilitate trade and the transport of materials (e.g., manures and straw). In this case, integrating crop and livestock production within the farm may be preferable to their integration across farms. In fact, the latter may be subject to market failures due to strategic behavior and transparency issues regarding the quality of traded products, or when the inputs in question are difficult to transfer. For example, the nature of effluents (e.g., farmyard manure) often makes them difficult to transport, sell/exchange, and use (Dupraz, 1996). Furthermore, effluents do not have the same value for all farms. Similarly, an exchange of grazing services between a sheep farmer and an orchard owner may be disrupted by information problems if the farmer has doubts about the quality of the pasture (Dupraz, 1996).

Table S1. Integration practices of mixed crop-livestock systems

Dimensions	Integration practices	Description
Farming practice management	**Crop-grassland integration**	This concerns crop-pasture rotation and can be evaluated from the share pasture in rotation with crop.
	Crop-crop integration	This is about crop diversification practices, such as the use of varietal mixes, associated crops, intermediate crops, crop rotation, and agroforestry. The inclusion of legumes, which can fix nitrogen from the air, in plots or rotations increases soil nitrogen concentration, can benefits other crops and limits synthetic nitrogen requirements.
	Crop-livestock integration	This may concerns: - The share of cash crops used for animal feed; - Concentrate autonomy (%) ; - The proportion of crop residues and cover crops grazed by animals; - The share of plant cover harvested for animal feed; - The percentage of crops where straw (feed or litter) is harvested for animals. - The identification of the types of crops used for animal feeding, how they are used, and their crop acreage. - The use (or the qty) of livestock effluents for crop fertilization; - The grazing of forage crops and stubble; - The use (or the qty) of crop residues used as green manure.
	Grassland-livestock integration	This may include: - The duration of animal grazing ; - The share of pasture grazing in animal feed; - The share of pasture used for hay or silage production; - The use (or the qty) of livestock effluents for grassland fertilization; - Pasture height.
	Livestock - Livestock integration	This may concern: - Building shared simultaneously by several animal species; - Building shared successively by several animal species; - The percentage of grasslands grazed simultaneously by at least two animal species; - The percentage of grasslands grazed successively by at least two animal species; - The share small animals in mixed livestock farming.
	Crop-Livestock-Grassland integration	This may include: - The use of dual-purpose crops ; - The share of farmland (cash crops, forage crops, grassland) used for animal feeding; - The amount of nitrogen produced and spread; - Forage autonomy (%) ; - Feed autonomy (%) ; - Animal traction for plowing meadow and crop land; - Biomass transfer or exchange (feed-manure).
	Production and processing integration	This may concern: - The quantity of by-products (e.g., whey from cheese production, bran, flour, and dregs from grain processing) used to feed animals; - The share of by-products in feed ration(%); - Biogas residue use.
Sales management	**Product processing**	This includes: - Sales of on-farm processed products; - The number of processed products from two different farm production activities (crop and livestock). sales management can facilitate crop-livestock integration when processed products sold on-farm are made from ingredients (raw material) coming from two different farm production activities (crop and livestock).
	Marketing	This is about: - The choice of short or long marketing channels; - The type of customers (cooperatives, producers' stores, direct-sales consumers, supermarkets and hypermarkets); - The number (or %) of customers by marketing channels; - The seasonality of sales; - The share self-consuming (or sold) product (%).
Quasi-public input management		A quasi-public input is an input that, once acquired for one production, can provide services at a lower cost to other productions. This may concern: - The (optimal) herd size for sufficient manure production; - The shared use of production factors; - The versatility of (or multi-skilled) workers and work organization.

Table S2. Definition and descriptive statistics of the outcome and moderator variables

Variables	Description	Mean	STD
Dependent variable			
Double performance	=1 for study reported that MCLS are more economically and environmentally performant than SPS, 0 otherwise.	0.60	0.49
Moderator variables			
Technical institutions	=1 for study including technical institutions, 0 otherwise.	0.22	0.42
Americas	=1 for study carried out in the Americas (North America, South America, and the Caribbean), 0 otherwise.	0.37	0.48
Asia	=1 for study carried out in Asia, 0 otherwise.	0.23	0.42
Africa	=1 for study carried out in Africa, 0 otherwise.	0.10	0.30
Oceania	=1 for study carried out in Oceania, 0 otherwise.	0.02	0.15
Europe	=1 for study carried out in Europe, 0 otherwise.		
Study length	Duration of the study in years.	5.11	5.21
Crops and crop-pasture rotation	=1 for study providing information on crop-grassland and crop-crop integrations, 0 otherwise.	0.37	0.48
Agroforestry	=1 for study reported the inclusion of woody vegetation in MCLSs, 0 otherwise.	0.14	0.35
Biomass transfer	=1 for study providing information on biomass transfer (feed, manure), 0 otherwise.	0.26	0.49
Cover crops	=1 for study reported the inclusion of crops for agronomic or environmental purposes in addition to the main crop, 0 otherwise.	0.25	0.43
Rice-Animal system	=1 for Rice-Animal (Fish, duck, crabs,…) system, 0 otherwise.	0.05	0.21
Poultry-Crop system	=1 for Poultry-Crop system, 0 otherwise.	0.06	0.23
Herbivores-Crop system	=1 for Herbivores (large and small animals)-Crop system, 0 otherwise.	0.04	0.19
Pig-Herbivores-Crop system	=1 for Pig-Herbivores-Crop system, 0 otherwise.	0.04	0.21
Usable agricultural area	Usable agricultural area in MCLS in ha	121.73	354.35
Published	=1 for peer-reviewed publications, 0 otherwise.	0.92	0.28
Experiments and simulations	=1 for experiments and simulation studies, 0 otherwise.	0.70	0.46
Economic def. of MCLS	=1 for study based on economic definition of MCLS, 0 otherwise.	0.07	0.26
Functional def. of MCLS	=1 for study based on functional definition (flow of matter) of MCLS, 0 otherwise.	0.80	0.40
Structural def. of MCLS		0.13	0.33
Territory level study	=1 for study carried out at the territory level, 0 otherwise.	0.04	0.20
Farm-level study	=1 for study carried out at the farm level, 0 otherwise.	0.44	0.50
No crop sales	=1 for study where all the crops produced are used for animal feeding, 0 otherwise.	0.02	0.13
Bio-slurry	=1 for study where bio-slurry is used as organic fertilizers, 0 otherwise.	0.02	0.14
Number of integration practices	Number of integration practices	2.20	1.25

Table S3. Summary of the main characteristics of the studies

		Percentage of studies	Mean	STD
Authors' affiliations & co-design	Research and higher education (RHE)	91.14	/	/
	Technical institutions (TECHI)	22.14	/	/
	Governmental agencies (GOV)	19.14	/	/
	Non-governmental organizations (NGO)	4.86	/	/
	Only RHE	49.29	/	/
	RHE-TECHI	18.14	/	/
	Farmers	0.4	/	/
	Co-design	4	/	/
Study types	Simulations and Experiments	70	/	/
	Survey	30	/	/
Study levels	Plot level	52	/	/
	Farm level	44	/	/
	Territory level	4	/	/
Study length	1-2 years	31.17	/	/
	3-5 years	23.29	/	/
	6-10 years	11.00	/	/
	More than 10 years	9.87	/	/
Number of observations	1-5 observations	4.71	/	/
	6-30 observations	4.29	/	/
	31-100 observations	4.00	/	/
	More than 100 observations	2.86	/	/
Soil type				
Climate conditions	**Altitude:** 4-2268 m.a.s.l (meter above sea level)			
	Rainfall: 41-3779 mm			
	Temperature: 1-31 °C			

Table S4. Integration practices

		Percentage of studies	Mean	STD
Qualitative integration practices	Crop-pasture rotation	30.00	/	/
	Crop-crop rotation	36.29	/	/
	Grazing cover crops	20.57	/	/
	Cover crop and inter-cropping	24.71	/	/
	Agro-forestry	14.29	/	/
	Maize-grass-hay sillage	0.86	/	/
	Biomass transfer (feed-manure)	62.71	/	/
	Dual-purpose crops	0.57	/	/
	Crop residue forage	29.00	/	/
	Crop residue grazing	30.86	/	/
	Crop residue as green manure	25.14	/	/
	Grass-legume association	22.00	/	/
	Biogas residue use	1.86	/	/
	Animal traction	1.14	/	/
Quantitative integration practices	Share grassland (% usable agricultural area)	15.00	47.38	26.05
	Share pasture in rotation with crop(% of crop area)	1.29	38.33	8.76
	Share maize (% fodder area)	5.43	18.28	10.94
	Share legume (% fodder area)	1.71	38.32	20.70
	Share UAA for animal feeding	11.71	67.10	27.26
	Share cash crop for animal feeding	4.71	8.74	9.73
	Qty of manure per ha (t)	7.00	27.64	108.28
	DM application per ha	1.86	86.65	189.45
	Grazing duration (days)	3.86	107	73
	Pasture height (cm)	3.71	21.28	11.06
	Share fodder area(%)	14.28	53.27	26.59
	Share cash crop(%)	6.43	47.43	26.05
	Share by-product in feed ration(%)	0.86	59.37	29.37
	Share grass hay in feed ration(%)	1.71	26.65	11.18
	Share grass sillage(%)	2.00	18.35	15.03
	Share maize silage in feed ration (%)	1.00	22.30	8.33
	Concentrate autonomy (%)	1.71	20.34	23.16
	Forage autonomy (%)	6.00	70.69	23.30
	Feed autonomy (%)	7.86	72.37	28.19
	Share self-consuming product (%)	1	20.71	14.94
	Manure exchange (ton)	0.43	47.89	22.71

Table S5. Economic performance of the specialized and mixed farms for the full sample

		Specialized systems Average (SD)	Mixed systems Average (SD)	Effects of mixed systems (%)
Economic performance	Productivity (USD/ha)	3411.10 (2802.79)	3843.15 (3135.49)	+12.67
	Productivity (GJ/ha)	285.85 (880.26)	250.09 (526.00)	-12.51
	Meat productivity (kg LW/ha)	476.03 (588.53)	736.93 (1269.78)	+54.81
	Milk productivity (L/ha)	8156.06 (6204.72)	6796.80 (7178.03)	-16.65
	Crop productivity (t/ha)	/a	/a	+8.67
	Total costs (USD/ha)	2156.10 (1891.06)	2517.90 (2040.94)	+16.78
	Net income (USD/ha)	1476.07 (1462.51)	2002.62 (2073.16)	+35.67
	Income variability (stdv)	1929.93 (4266.53)	1646.38 (3183.08)	-14.69

/a: for the crops, we cannot report productivity because it concerns different categories of production. However, for each crop, we compute the percent difference between MCLSs and specialized systems, allowing us to compare the productivity gains or losses (in %) for all crops.

Figure S1. Trends in publications appearing on the Web of Science on crop-livestock systems

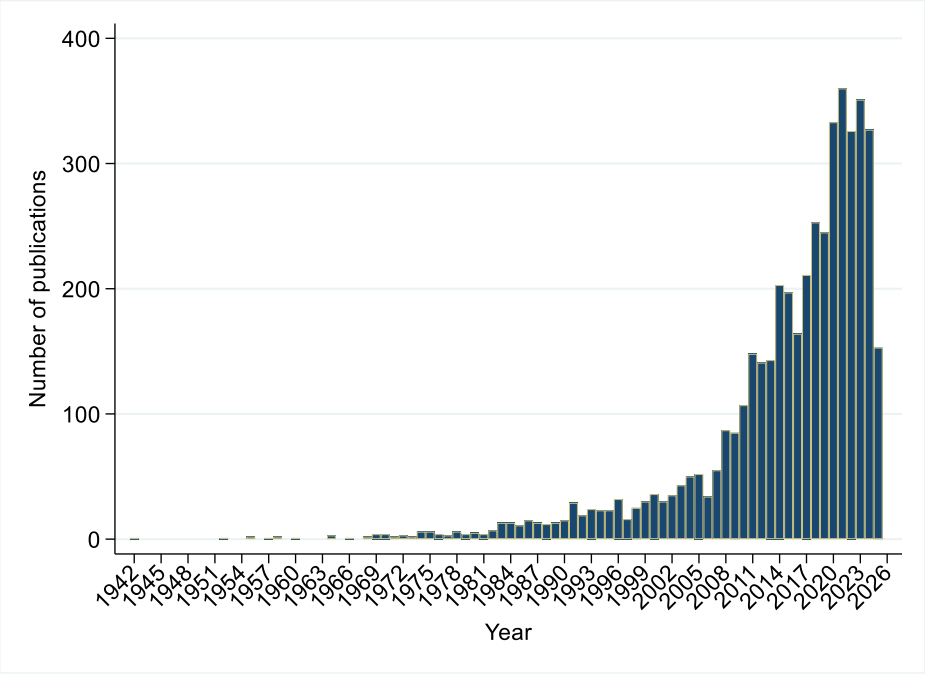

Figure S2. Institutions involved in more than 100 publications on crop-livestock systems over 1942-2025

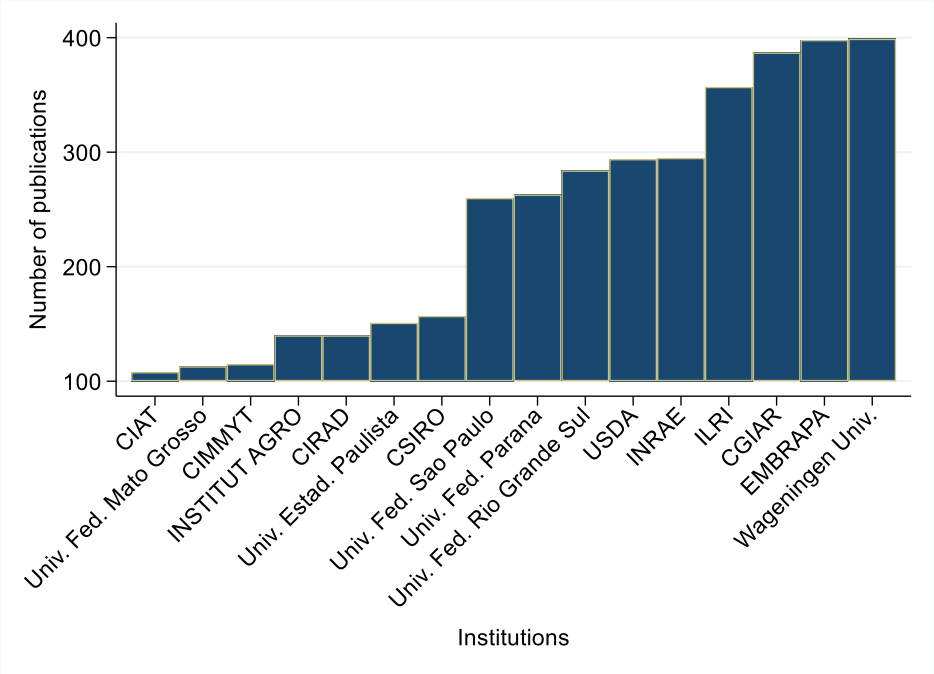

Figure S3. PRISMA plot showing the steps to reach a final set of 270 publications for the meta-analysis

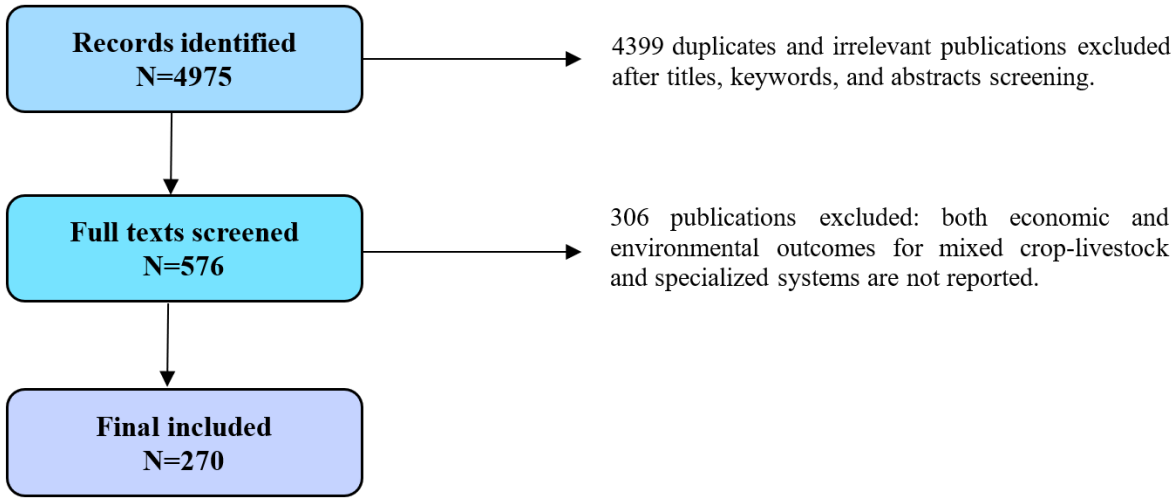

Table S6. Overview of the studies included in the meta-analysis

First Authors	Affiliation	Title	Pub_yr	Journal	Country	Altitude	Prec.	Temp.	Climate	Soil
Ngambeki	Research & HE	Integrating Livestock into Farming Systems in Northern Cameroon	1992	Agricultural Systems	Cameroon					
Koeijer	Research & HE	Environmental-Economic Analysis of Mixed Crop-Livestock Farming	1995	Agricultural Systems	Netherlands	Netherlands				
Rojas-Downing	Research & HE	Resource use and economic impacts in the transition from small confinement to pasture-based dairies	2017	Agricultural Systems	USA					
Andrieu	Research & HE; R&D	From farm scale synergies to village scale trade-offs: Cereal crop residues use in an agro-pastoral system of the Sudanian zone of Burkina Faso	2015	Agricultural Systems	Burkina Faso	Burkina Faso				
Macedo	Research & HE	Intensification of rice-pasture rotations with annual crops reduces the stability of sustainability across productivity, economic, and environmental indicators	2022	Agricultural Systems	Uruguay					
Veysset	Research & HE	Energy consumption, greenhouse gas emissions and economic performance assessments in French Charolais suckler cattle farms: Model-based analysis and forecasts	2010	Agricultural Systems	France					
Wagner	Research & HE	Assessing ammonia emission abatement measures in agriculture: Farmers' costs and society's benefits – A case study for Lower Saxony, Germany	2017	Agricultural Systems	Germany					
Mosnier	Research & HE; Tech Inst	Orfee: A bio-economic model to simulate integrated and intensive management of mixed crop-livestock farms and their greenhouse gas emissions	2017	Agricultural Systems	France					
Szymczak	Research & HE	System diversification and grazing management as resilience-enhancing agricultural practices: The case of crop-livestock integration	2020	Agricultural Systems	Brazil		130	16	humid subtropical	clayey Oxisol
Kahiluoto	Research & HE	No Evidence of Trade-Off between Farm Efficiency and Resilience: Dependence of Resource-Use Efficiency on Land-Use Diversity	2016	Plos one	Finland					
Toorop	Research & HE; R&D	Using a positive deviance approach to inform farming systems redesign: A case study from Bihar, India	2020	Agricultural Systems	India					
Paul	Research & HE; R&D	Crop-livestock integration provides opportunities to mitigate environmental trade-offs in	2022	Agricultural Systems	Cambodia;Laos;Vietnam	300;1200;650	2218	26.2;19.6; 24.8		Acrisols;Basaltic soil

		transitioning smallholder agricultural systems of the Greater Mekong Subregion								
Alvarez-Rodriguez	Research & HE	Circularity and livestock diversity: Pathways to sustainability in intensive pig farming regions	2024	Agricultural Systems	Spain	180	358	16.1	Semiarid continental Mediterranean	Semiarid continental Mediterranean
Li	Research & HE	Evaluation of annual production and economic benefits of tropical rice-crayfish coculture system in China	2024	Agricultural Systems	China		1459.55	27.7		
Delandmeter	Research & HE	Integrated crop and livestock systems increase both climate change adaptation and mitigation capacities	2024	Science of the Total Environment	Brazil		1850	19	warm humid subtropical	clayey oxisol, Rhodic Hapludox
Martins	Research & HE	Nine-year impact of grazing management on soil acidity and aluminum speciation and fractionation in a long-term no-till integrated crop-livestock system in the subtropics	2020	Geoderma	Brazil	465	1850	19	humid subtropical	clayey oxisol, Rhodic Hapludox
Martins	Research & HE	Nine-year impact of grazing management on soil acidity and aluminum speciation and fractionation in a long-term no-till integrated crop-livestock system in the subtropics	2020	Geoderma	Brazil	465	1850	19	humid subtropical	clayey oxisol, Rhodic Hapludox
Costa	Research & HE	Impact of an integrated no-till crop–livestock system on phosphorus distribution, availability and stock	2014	Agriculture, Ecosystems and Environment	Brazil		1850	19	warm humid subtropical	clayey Oxisol
Mori	Research & HE	Grazing intensity for enhanced resource use efficiency in integrated crop-livestock systems: Balancing soil carbon storage and food security	2025	Journal of Environmental Management	Brazil		2037	20.7	warm humid subtropical	clayey Oxisol
Tabacco	Research & HE	Field scale biodiversity in relation to the intensity grade of agricultural practices on dairy farms	2023	European Journal of Agronomy	Italy					sandy loam
Bell	Gov Agency; SA	Impacts of soil damage by grazing livestock on crop productivity	2011	Soil & Tillage Research	Australia		223			clay loam
George	Research & HE	Impact of grazing on soil properties and cotton yield in an integrated crop–livestock system	2013	Soil & Tillage Research	USA					Ultisol, Dothan sandy loam
Barsotti	Gov Agency; Research & HE	Crop yields and soil organic matter responses to sheep grazing in US northern Great Plains	2013	Soil & Tillage Research	USA		465	6.2		Blackmore silt loam
Cecagno	Research & HE	Least limiting water range and soybean yield in a long-term, no-till, integrated crop-livestock system under different grazing intensities	2016	Soil & Tillage Research	Brazil	465	1850	19	warm humid subtropical	warm humid subtropical
Almeida	Research & HE	Forms and balance of soil potassium from a long-term integrated crop-livestock system in a subtropical Oxisol	2021	Soil & Tillage Research	Brazil		1673	19	warm humid subtropical	clayey oxisol, Rhodic Hapludox
Piva	Research & HE; SA;Tech Inst	Soil gaseous N2O and CH4 emissions and carbon pool due to integrated crop-livestock in a subtropical Ferralsol	2014	Agriculture, Ecosystems and Environment	Brazil	996	1400	18	humid subtropical	Clayey Umbric Ferralsol
Assmann	Research & HE	Soil carbon and nitrogen stocks and fractions in a long-term integrated crop–livestock system under no-tillage in southern Brazil	2014	Agriculture, Ecosystems and Environment	Brazil				warm humid subtropical	clayey Oxisol: Rhodic Hapludox
Wachter	Research & HE	Productivity, economic performance, and soil quality of conventional, mixed, and organic dryland farming systems in eastern Washington State	2019	Agriculture, Ecosystems and Environment	USA		535	9.55		Palouse silt loam, Thatuna silt loam
Simoes	Research & HE	Structural soil quality and system fertilization efficiency in integrated crop-livestock system	2023	Agriculture, Ecosystems and Environment	Brazil					
Silva	Tech Inst; Research & HE;SA	Integration crop-livestock system increases the sustainability of soybean cultivation through improved soil health and plant physiology	2024	Agriculture, Ecosystems and Environment	Brazil		1500	24.5		
Hai	Research & HE; R&D;Tech Inst;Gov Agency	Integrated farming system producing zero emissions and sustainable livelihood for small-scale cattle farms: Case study in the Mékong Delta, Vietnam	2020	Environmental Pollution	Vietnam					
Ma	Research & HE; Tech Inst	Cooperation between specialized livestock and crop farms can reduce environmental footprints and increase net profits in livestock production	2022	Journal of Environmental Management	China					
Lenssen	Research & HE;Gov Agency	Integrating sheep grazing into wheat–fallow systems: Crop yield and soil properties	2013	Field Crops Research	USA	1468	465			Blackmore silt loam

Hunt	Gov Agency; Tech Inst;SA	Sheep grazing on crop residues do not reduce crop yields in no-till, controlled traffic farming systems in an equi-seasonal rainfall environment	2016	Field Crops Research	Australia		520			red chromosol soil
Theisen	SA enterprise;Research & HE	The birth of a new cropping system: towards sustainability in the subtropical lowland agriculture	2017	Field Crops Research	Brazil		1367	17.8		Solodic haplic eutrophic Planosol
Crusciol	Tech Inst; Research & HE;Gov Agency	Upland rice intercropped with forage grasses in an integrated crop-livestock system: Optimizing nitrogen management and food production	2021	Field Crops Research	Brazil	740	1359	20.5	humid tropical	clayey, kaolinitic, thermic Typic Haplothox
Schader	Research & HE; R&D	Quantification of the effectiveness of greenhouse gas mitigation measures in Swiss organic milk production using a life cycle assessment approach	2014	Journal of Cleaner Production	Swiss	650				
Wan	Tech Inst;Gov Agency;Research & HE	Ecological intensification of rice production through rice-fish co-culture	2019	Journal of Cleaner Production	China		1003.7	15.3		
Li	Tech Inst; R&D;Research & HE	Comparing specialised crop and integrated crop-livestock systems in China with a multi-criteria approach using the emergy method	2021	Journal of Cleaner Production	China		750	12.5		
da Silva Lopes	Tech Inst; Research & HE;SA	Assessing the economic and environmental performance of cleaner production practices in eucalyptus planted forests using life cycle assessment	2022	Journal of Cleaner Production	Brazil					
Ma	Research & HE; Tech Inst	Decreasing environmental footprints of dairy production systems through optimization of feed rations and origins	2024	Journal of Cleaner Production	China		245	7.2		
Allan	Research & HE; Tech Inst;Gov Agency	Light grazing of crop residues by sheep in a Mediterranean-type environment has little impact on following no-tillage crops	2016	European Journal of Agronomy	Australia		450			sand, clays
Ryschawy	Research & HE	Mixed crop-livestock systems: an economic and environmental-friendly way of farming?	2012	Animal	France		700			
Penati	Research & HE	Effect of abandoning highland grazing on nutrient balances and economic performance of Italian Alpine dairy farms	2011	Livestock Science	Italy					
Alary	Research & HE; Tech Inst	The dynamic of crop-livestock systems in the Mediterranean and future prospective at local level: A comparative analysis for South and North Mediterranean systems	2019	Livestock Science	Italy, Morocco, France	Italy, Morocco, France				
Vall	Research & HE; Tech Inst	Intégration agriculture-élevage et intensification écologique dans les systèmes agrosylvopastoraux de l'Ouest du Burkina Faso, province du Tuy	2011		Burkina Faso	Burkina Faso				
Liebman	Research & HE	Enhancing agroecosystem performance and resilience through increased diversification of landscapes and cropping systems	2015	Elementa: Science of the Anthropocene	USA					
Sainju	Gov Agency; Research & HE	Sheep Grazing in a Wheat–Fallow System Affects Dryland Soil Properties and Grain Yield	2011	Soil Fertility & Plant Nutrition	USA	1468	465	6.6		Blackmore silt loam
Funes-Monzote	Research & HE	Agro-Ecological Indicators (AEIs) for Dairy and Mixed Farming Systems Classification: Identifying Alternatives for the Cuban Livestock Sector	2009	Journal of Sustainable Agriculture	Cuba	60	1288.4	25.88		Ferrasols, Cambisols, Luvisols,Vertisols
Tabacco	Research & HE;NGO	Production efficiency, costs and environmental impacts of conventional and dynamic forage systems for dairy farms in Italy	2018	European Journal of Agronomy	Italy	239.5;409,5	850	12.1; 12.3	temperate sub-continental	Gleyic Luvisol;Haplic Luvisol
Monteiro	Research & HE	Crop-livestock-forestry systems as a strategy for mitigating greenhouse gas emissions and enhancing the sustainability of forage-based livestock systems in the Amazon biome	2024	Science of the Total Environment	Brazil					
dos Reis	SA enterprise; Research & HE	Fuzzy logic indicators for the assessment of farming sustainability strategies in a tropical agricultural frontier	2023	Agronomy for Sustainable Development	Brazil					
dos Reis	SA enterprise; Research & HE	Fuzzy logic indicators for the assessment of farming sustainability strategies in a tropical agricultural frontier	2023	Agronomy for Sustainable Development	Brazil					

Rosado	Research & HE	Sustainability of crop and livestock dominant dryland systems of Alentejo region: differences in economic returns and environmental consequences	2015	Revista de Ciências Agrárias	Portugal				medit	clay soils
Rusinamhodzi	R&D; Research & HE	Maize crop residue uses and trade-offs on smallholder crop-livestock farms in Zimbabwe: Economic implications of intensification	2015	Agriculture, Ecosystems and Environment	Zimbabwe	1300	750		tropical humid	clay soils
Blanco-Canqui	Research & HE; Tech Inst;R&D	Does cover crop grazing damage soils and reduce crop yields?	2020	Agrosystems, Geosciences & Environment	USA					
Funes-Monzote	Research & HE; Tech Inst;R&D	Initial evaluation of integrated systems for food and Energy production in Cuba	2011	Pastos y Forrajes	Cuba					
Liebman	Research & HE	Agronomic and Economic Performance Characteristics of Conventional and Low-External-Input Cropping Systems in the Central Corn Belt	2008	Agronomy Journal	USA	333	90.38	15.5		Clarion loam, Nicollet loam, Webster silty clay loam
Maughan	Research & HE; Tech Inst	Soil Quality and Corn Yield under Crop–Livestock Integration in Illinois	2009	Agronomy Journal	USA		87.5	9.4		
Sainju	Gov Agency; Research & HE	Dryland Soil Carbon and Nitrogen Influenced by Sheep Grazing in the Wheat–Fallow System	2010	Agronomy Journal	USA	1486	465	6.6		
Schlegel	Research & HE; R&D;Tech Inst	Corn Response to Long-Term Applications of Cattle Manure, Swine Effl uent, and Inorganic Nitrogen Fertilizer	2015	Agronomy Journal	USA		310.7			
Pilecco	Research & HE	Ryegrass early sowing into soybean to mitigate nitrous oxide emissions in a subtropical integrated crop-livestock system	2019	Agriculture, Ecosystems and Environment	Brazil		1237.5	19.7		
Nurudeen	Tech Inst;NGO	Intensifying maize production in integrated crop-livestock farming systems in northern Ghana	2015		Ghana					
Arrieche-Luna	Research & HE; Tech Inst	Influence of inorganic and organic fertilization on microbial biomass carbon and maize yield in two soils of contrasting pH	2010	Agrociencia	Venezuela					Oxic Haplustalfs (sand silt clay)
Agostini	Research & HE; Tech Inst	Crop residue grazing and tillage systems effects on soil physical properties and corn (Zea mays L.) performance	2012	Journal of Soil Science and Plant Nutrition	Argentina					clayey, mixed, thermic Typic Argiudoll
Cabrini	Tech Inst	Modeling economic-environmental decision making for agricultural land use in Argentinean Pampas	2016	Agricultural Systems	Argentina		900		temperate-humid climate	temperate-humid climate
Funes-Monzote	Tech Inst; Research & HE	Conversion of specialised dairy farming systems into sustainable mixed farming systems in Cuba	2009	Environ Dev Sustain	Cuba		1400	25.1		Haplic Ferralsol
Puech	Research & HE	Diversification of an integrated crop-livestock system: Agroecological and food production assessment at farm scale	2023	Agriculture, Ecosystems and Environment	France	285	790	10.4	semicontinental climate	clay and clay-loam soils
Stavi	Research & HE;Gov Agency	No adverse effect of moderate stubble grazing on soil quality and organic carbon pool in dryland wheat agro-ecosystems	2015	Agron. Sustain. Dev	Israel		200	19	semiarid	Loessial Serozems (Haplargids) with sandy loam texture
Tracy	Research & HE	Soil Compaction, Corn Yield Response, and Soil Nutrient Pool Dynamics within an Integrated Crop-Livestock System in Illinois	2008	Crop Science	USA		1001	13.4		fine, smectitic, mesic Vertic Argiaquolls
Taifouris	Research & HE	Toward a Circular Economy Approach for Integrated Intensive Livestock and Cropping Systems	2021	ACS Sustainable Chemistry & Engineering	Spain					
Virgona	Research & HE;Gov Agency	Effects of grazing on wheat growth, yield, development, water use, and nitrogen use	2006	Australian Journal of Agricultural Research	Australia	780	609			Red Kandosol
Duru	Research & HE	Livestock system sustainability and resilience in intensive production zones: which form of ecological modernization?	2014	Reg Environ Change	France					
Afi	Research & HE	Integrated vs. Specialized Farming Systems for Sustainable Food Production: Comparative Analysis of Systems' Technical Efficiency in Nebraska	2023	Sustainability	USA					
Esteves	Research & HE; Tech Inst;SA	Greenhouse gas emissions related to biodiesel from traditional soybean farming compared to integrated crop-livestock systems	2018	Journal of Cleaner Production	Brazil					

Kamali	Research & HE	Evaluation of beef sustainability in conventional, organic, and mixed crop-beef supply chains	2014		Brazil					
Agethen	Research & HE; SA;NGO	Future perspectives of Brazilian beef production: what is the role of Silvopastoral systems?	2024	Agroforest Syst	Brazil					
Crusciol	Tech Inst;Research & HE;Gov Agency	Overcoming Competition From Intercropped Forages on Upland Rice With Optimized Nitrogen Input to Food Production in Tropical Region	2020	Frontiers in Sustainable Food Systems	Brazil	740	1359	20.5	humid subtropical	clayey, kaolinitic, thermic Typic Haplothox
Shanmugam	Research & HE;Gov Agency;Tech Inst;Gov Agency	Crop–livestock-integrated farming system: a strategy to achieve synergy between agricultural production, nutritional security, and environmental sustainability	2024	Frontiers in Sustainable Food Systems	India	426.7	3778.9	30.4	tropical wet and dry climate	tropical wet and dry climate
Houlbrooke	Research & HE	Grazing strategies to protect soil physical properties and maximise pasture yield on a Southland dairy farm	2009	New Zealand Journal of Agricultural Research	New zeland		85.33	9.83		
Mesa	Research & HE;Intergov org;Tech Inst	Indicators of Agroecological Sustainability of Three Tillage Systems for Maize (Zea mayz L.) Production	2014	Agroecology and Sustainable Food Systems	Mexico	1550	660	21.5		
Sneessens	Research & HE	Sheep'n'Crop—an integrated whole-farm model to assess environmental and economic performances	2014	Thesis	France					
Bilenky	Research & HE	Integrating pastured meat chickens into organic vegetable production increased nitrogen and microbial biomass with variability in presence of E. coli and Salmonella spp	2023	Renewable Agriculture and Food Systems	USA		895.3	9.5		fine-loamy, mixed, superactive, mesic Typic Hapludoll
Figueiredo	Research & HE	Greenhouse gas balance and carbon footprint of beef cattle in three contrasting pasture-management systems in Brazil	2017	Journal of Cleaner Production	Brazil					
Marton	Research & HE	Comparing the environmental performance of mixed and specialised dairy farms: the role of the system level analysed	2016	Journal of Cleaner Production	Switzerland					
Bénagabou	Tech Inst;Research & HE	L'intégration agriculture-élevage améliore-t-elle l'efficience, le recyclage et l'autonomie énergétique brute des exploitations familiales mixtes au Burkina Faso ?	2017	Revue d'élevage et de médecine vétérinaire des pays tropicaux	Burkina Faso	Burkina Faso				
Perdomo	Intergov org	Agronomic and environmental effects of shifting integrated cropping-livestock systems to continuous cropping rotations in Uruguayla productivité	2020	WP	Uruguay		1300	18	humid subtropical climate	Typic Argiudoll
Mendonça	Research & HE; Tech Inst	Economic gains from croplivestock integration in relation to conventional systems	2020	Revista Brasileira de Zootecnia	Brazil	548				
Liyanage	Tech Inst; Research & HE	Integration of legume-based pasture and cattle into coconut farming systems in Sri Lanka	1993	Journal of Asian Farming Systems Association	Sri Lanka		1600			
Delate	Research & HE	Agroecosystem Performance during Transition to Certified Organic Grain Production	2004	Agronomy Journal	USA		73.35	10.58		Macks-burg silty clay loam
Sherrod	Gov Agency; Research & HE	Cropping Intensity Enhances Soil Organic Carbon and Nitrogen in a No-Till Agroecosystem	2003	Soil Science Society of America Journal	USA		717.5			Sand Silt Clay
Schuman	Gov Agency	Impact of grazing management on the carbon and nitrogen balance of a mixed-grass rangeland	1999	Ecological Applications	USA	1930	384		semiarid climate	Ascalon and Altvan sandy loams
Tanaka	Gov Agency	An integrated approach to crop/livestock systems: Forage and grain production for swath grazing	2005	Renewable Agriculture and Food Systems	USA		41.3			
Matthews	Research & HE	Environmental sustainability and greenhouse gas emissions of cash crop vs. crop-livestock integrated rotation systems	2023	MSC thesis	South Africa	191	395	18.2	Mediterranean climate	Stagnic/Albic/ Leptic Lixisol
Minviel	Research & HE	Are there economies of inputs in mixed croplivestock farming systems? A cross-frontier approach applied to French dairy-grain farms	2021	Applied Economics	France					
Mosnier	Research & HE	Does mixing livestock farming enterprises improve farm and product sustainability?	2021	International Journal of Agricultural Sustainability	France					
Sangare	NGO; R&D;Research & HE	Influence of dry season supplementation for cattle on soil fertility and millet (Pennisetum glaucum L.) yield in a mixed	2002	Nutrient Cycling in Agroecosystems	Niger		450		semiarid tropical	semiarid tropical

		crop/livestock production system of the Sahel								
Udo	Research & HE;Gov Agency	Intensification to reduce the carbon footprint of smallholder milk production: fact or fiction?	2016	Outlook on Agriculture	Kenya					
Millar	Tech Inst	Pasture cropping: a new approach to integrate crop and livestock farming systems	2009	Animal Production Science	Australia		618	22.8		red dermosol soils
Liebman	Research & HE	Using biodiversity to link agricultural productivity with environmental quality: Results from three field experiments in Iowa	2013	Renewable Agriculture and Food Systems	USA					
Liebman	Research & HE	Using biodiversity to link agricultural productivity with environmental quality: Results from three field experiments in Iowa	2013	Renewable Agriculture and Food Systems	USA					
Xu	Tech Inst;Gov Agency;Research & HE	Response of Vegetation and Soil Carbon and Nitrogen Storage to Grazing Intensity in Semi-Arid Grasslands in the Agro-Pastoral Zone of Northern China	2014	Plos One	China	1375	1200	1.5		
Macedo	Research & HE	Rice-pasture agroecosystem intensification affects energy use efficiency	2021	Journal of Cleaner Production	Uruguay	22	1360	16.9		Argialboll
Hou	Gov Agency; Tech Inst	Integrated crop-livestock production systems in China	2008	The Rangeland Journal	China					
Allen	Research & HE;Gov Agency	Integrating cotton and beef production to reduce water withdrawal from the Ogallala aquifer in the Southern High Plains	2005	Agronomy Journal	USA	993	470			Pullman clay
dos Reis	SA enterprise; Tech Inst;NGO;Research & HE	Economic and environmental impacts of integrated systems adoption in Brazilian agriculture-forest frontier	2023	Agroforest Syst	Brazil					
Regan	Research & HE; SA	Does the recoupling of dairy and crop production via cooperation between farms generate environmental benefits? A case-study approach in Europe	2017	European Journal of Agronomy	360	360	360	14.2	Mediterranean; Altantic; Alpine	loam to silty loam; sand
Tobin	Research & HE	Demonstrating Short-Term Impacts of Grazing and Cover Crops on Soil Health and Economic Benefits in an Integrated Crop-Livestock System in South Dakota	2020	Open Journal of Soil Science	USA		627.4	8.85		
Gil	Research & HE;Gov Agency;SA	Tradeoffs in the quest for climate smart agricultural intensification in Mato Grosso, Brazil	2018	Environmental Research Letters	Brazil					
Trouher	Research & HE	Trajectories of crop–livestock integration in the context of specialization in Northwest Vietnam	2023	The Journal of Agricultural Science	Vietnam		2000			
Veysset	Research & HE	Variability in greenhouse gas emissions, fossil energy consumption and farm economics in suckler beef production in 59 French farms	2014	Agriculture, Ecosystems and Environment	France					
Walker	Research & HE	Potential for and implications of cover cropping and grazing cover crops in wheat agroecosystems in Montana	2017	MSC thesis	USA	1461.5	430	7.63		Silt loam
Genest-Richard	Research & HE; Tech Inst	Multivariate analysis of economic performance and environmental impacts of multispecies pastured livestock farms using direct marketing	2025	Agricultural Systems	Canada					
Wei	Tech Inst;Research & HE	Sustainable options for improving the economic benefit, energy and ecological efficiency of maize-based forage systems in the North	2025	Energy	China		474	12.8	temperate, semi-humid monsoon climate	silt loam Haplic Cambisol
Alderkamp	Research & HE	Integrating crop and dairy production systems: Exploring different strategies to achieve environmental targets	2025	Science of the Total Environment	Netherlands	Netherlands				sandy soil
Chen	Research & HE	Improving crop-livestock integration in China using numerical experiments at catchment and regional scales	2023	Agriculture, Ecosystems and Environment	China		1612	17.3		
Papanicolaou	Gov Agency	A system dynamics modeling framework to evaluate impacts on economic, environmental, and social quality components of a U.S. Midwestern agroecosystem transitioning from row crop agriculture to mixed farming systems	2025	Ecological Modelling	USA					
Monti	Research & HE	Cereal/grain legume intercropping in rotation with durum wheat in crop/ livestock production systems for Mediterranean farming system	2019	Field Crops Research	Italy	100	709	16.1	Mediterranean	sandy-clay-loam soil

dos Reis	SARL enterprise; Tech Inst;Research & HE;Gov Agency	Integrated crop-livestock systems: A sustainable land-use alternative for food production in the Brazilian Cerrado and Amazon	2021	Journal of Cleaner Production	Brazil					
Yue	Research & HE; Tech Inst	Managing agricultural crop and livestock land use for synergistic energy-economy-environment development: A hybrid multi-objective optimization approach under a waste-to-energy nexus	2025	Journal of Cleaner Production	China		1600	16		
Benoit	Research & HE	Energy consumption in mixed crop-sheep farming systems: what factors of variation and how to decrease?	2010	Animal	France					
Lentz	Gov Agency	Biochar and Manure Effects on Net Nitrogen Mineralization and Greenhouse Gas Emissions from Calcareous Soil under Corn	2014	Soil Biology & Biochemistry	USA	1190	200	10		Portneuf silt loam
Vall	Research & HE	Chemins d'intensification et durabilité des exploitations de polyculture-élevage en Afrique subsaharienne : contribution de l'association agriculture-élevage	2017	Cahiers Agricultures	Cameroon,Burkina Faso	Cameroon,Burkina Faso	1000			
Peterson	Research & HE	Winter grazing does not affect soybean yield despite lower soil water content in a subtropical crop-livestock system	2019	Agronomy for Sustainable Development	Brazil		1850	19	subtropical	clayey Oxisol
Puech	Research & HE	Diversification d'un système de polyculture-élevage bovin laitier autonome : les complémentarités cultures-élevages pour l'alimentation humaine	2022	conf	France		423.5			
Perrot	Tech Inst;Gov Agency	Analyse comparée des coûts de production et des externalités environnementales en polyculture-élevage laitier bovin par rapport aux systèmes spécialisés	2011	Rapport	France					
Perrot	Tech Inst;Gov Agency	Économies d'échelle et économies de gamme en production laitière. Analyse technico-économique et environnementale des exploitations de polyculture élevage françaises	2012	Renc. Rech. Ruminant	France					
Foray	Tech Inst	Gestion de l'azote dans les systèmes d'élevages herbivores: Evaluation et amélioration de l'efficience de l'azote, réduction des transferts vers les milieux aquatiques	2017	Rapport	France					
Flores-Sanchez	Research & HE; Tech Inst	Diagnosis for ecological intensification of maize-based smallholder farming systems in the Costa Chica, Mexico	2011	Nutr Cycl Agroecosyst	Mexico	600	1300	22.5		Sand, Silt Clay
Flores-Sanchez	Tech Inst;Research & HE	Options to improve family income, labor input and soil organic matter balances by soil management and maize–livestock interactions. Exploration of farm-specific options for a region in Southwest Mexico	2014	Renewable Agriculture and Food Systems	Mexico	600	1300	22.5		Sand, Silt Clay
Bijarniya	R&D; Tech Inst;NGO	Holistic analysis of cropping diversity and intensity implications for productive, environmental, and nutritional performance of smallholder farms in Bihar, India	2024	Frontiers in Sustainable Food Systems	India		1140	24.5	hot and humid in summer and cold in winter	hot and humid in summer and cold in winter
Zhuo	Research & HE; Farmer;Farm owner	Integrated crop–livestock system and farm resilience enhancement: evidence from ecological rice–duck farming system in China	2025	International Food and Agribusiness Management Review	China		1065	17.5	subtropical monsoon climate	subtropical monsoon climate
Bonnin	Research & HE; SA	Evaluation of the environmental impacts of suckler calf-to-beef mixed crop-livestock farms in northern Italy: A farm-based study	2022	Italian Journal of Agronomy	Italy					
Franzluebbers	Gov Agency	Crop and cattle responses to tillage systems for integrated crop–livestock production in the Southern Piedmont, USA	2006	Renewable Agriculture and Food Systems	USA					
Wu	Gov Agency;Research & HE	Farming ducks in a maize field: a new and potential crop-livestock system from China	2021	Agronomy for Sustainable Development	China	1860	1022.4	14.9		silty clay loam
Domínguez-Hernández	Tech Inst;Research & HE	Impact of the Integration Level in Crop–Livestock Systems on Biomass Production, Nutrient Recycling, and Energy Efficiency	2025	Biomass	Mexico	2268	950.6	13.8	temperate humid	mid-textured Andisols, slightly acidic
Rovira	Research & HE;Gov Agency	The 'Palo a Pique' Long-Term Research Platform: First 25 Years of	2020	Agronomy	Uruguay		1379	17		Typic Argiudols

		a Crop–Livestock Experiment in Uruguay								
Iyiola-Tunji	Tech Inst;Extension Serv	Evaluation of Crop-Livestock Integration Systems among Farm Families at Adopted Villages of the National Agricultural Extension and Research Liaison Services	2015	Journal of Agricultural Extension	Nigeria					
Meo-Filho	Research & HE; SA	Can Intensified Pasture Systems Reduce Enteric Methane Emissions from Beef Cattle in the Atlantic Forest Biome?	2022	Agronomy	Brazil	856				
Bénagabou	Research & HE	Performance énergétique fossile des exploitations de polyculture-élevage de l'Ouest du Burkina Faso : Rôle des pratiques d'intégration agriculture-élevage	2018	PhD thesis	Burkina Faso	Burkina Faso	1000			
Rodríguez-Ortega	Research & HE	Does intensification result in higher efficiency and sustainability? An emergy analysis of Mediterranean sheep-crop farming systems	2017	Journal of Cleaner Production	Spain	762.5	376.05	13.85	Mediterranean	Mediterranean
Skordos	Gov Agency;Research & HE	Sustainability Indicators of Different Production Systems of a Greek Local Sheep Breed	2024	Sustainability	Greece		583.33		cold winters and hot summers	cold winters and hot summers
Tavares	Research & HE	System fertilization in integrated crop-livestock management favors microbial processes, soil quality and production profitability	2024	Agriculture, Ecosystems and Environment	Brazil		1436	26.1	tropical climate	clay-sandy loam
Zhong	Research & HE	Assessment of the integrated rice-duck system in China	2008	Thesis	China					
Zhong	Research & HE	Assessment of the integrated rice-duck system in China	2008	Thesis	China					
Kumar	Gov Agency	Enhancing farm productivity, profitability, sustainability and livelihood of small farm holders through integrated farming system	2025	Indian Journal of Agricultural Sciences	India	67				
Paramesh	Gov Agency;Research & HE	Enhancing ecosystem services and energy use efficiency under organic and conventional nutrient management system to a sustainable arecanut based cropping system	2019	Energy	India		2850	26	hot and humid	clay and sandy
Karthik	Tech Inst;Research & HE	Designing a productive, profitable integrated farming system model with low water footprints for small and marginal farmers of Telangana	2024	Scientific Reports	India	527	859.6	26.25		
Rautaray	Gov Agency	Water Budgeting and Enhancing Water Productivity in Lowland Rice-Fish Farming System	2022	Book chapter	India		81.5			Clayey vertisol
Kumar	Gov Agency;Research & HE	Resource recycling and their management under integrated farming system for lowlands of Bihar	2012	Indian Journal of Agricultural Sciences	India					
HU	Tech Inst;Research & HE	Can the co-cultivation of rice and fish help sustain rice production?	2016	Scientific Reports	China					
Pereryra-Goday	Research & HE;Gov Agency	Economic, environmental and food security contribution of mixed farming crop-livestock rotational-based grazing beef systems	2025	Animal - Science Proceedings	Uruguay					
Gupta	Gov Agency	Sustaining productivity and livelihood of livestock farmers of the Bundelkhand region through integrated farming system	2025	Indian Journal of Agronomy	India	193	825	25	semiarid climate	semiarid climate
Pereyra-Goday	Research & HE;Gov Agency	Management and Productivity of Key Integrated Crop–Livestock Systems in Uruguay: The Palo a Pique Long-Term Experiment's Third Phase	2022	Agronomy	Uruguay		1249	23		Oxyaquic Argiudolls soils
Pereyra-Goday	Research & HE;Gov Agency	Carbon footprint of mixed farming crop-livestock rotational-based grazing beef systems using long term experimental data	2024	Agronomy for Sustainable Development	Uruguay		1249	23		Oxyaquic Argiudolls soils
Larbi	Research & HE; R&D	Crop residues for mulch and feed in crop-livestock systems: impact on maize grain yield and soil properties in the west African humid forest and savanna zones	2002	Expl Agric.	Nigeria		2320			Ultisol; Alfisol
Oomen	Research & HE;Gov Agency	Mixed farming systems as a way towards a more efficient use of nitrogen in European Union agriculture	1998	Environmental Pollution	Netherlands	Netherlands				
LE TROUHER	Research & HE	Contributions de l'intégration culture-élevage et de la diversification des activités agricoles et d'élevage aux performances et à la durabilité des fermes	2024	PhD thesis	Vietnam					
Farias	Research & HE	Integrated crop-livestock system with system fertilization approach improves food production and	2020	Agronomy for Sustainable Development	Brazil	46	1362	19.5		

		resource-use efficiency in agricultural lands								
Widadie	Research & HE	Comparison of integrated crop-livestock and non-integrated farming systems for financial feasibility, technical efficiency and adoption	2015	Journal of the International Society for Southeast Asian Agricultural Sciences	Indonesia					
Monjardino	Gov Agency; SA	Improved legume pastures increase economic value, resilience and sustainability of crop-livestock systems	2022	Agricultural Systems	Australia		350			
Lurette	Research & HE	A model to explore which diversity is needed to design sustainable agricultural systems at the territorial level	2020	Agronomy for Sustainable Development	France					
Ikpe	Research & HE;Gov Agency	Nutrient cycling practices and changes in soil properties in the crop-livestock farming systems of western Niger Republic of West Africa	2002	Nutrient Cycling in Agroecosystems	Niger		594.5			Clay silt sand
Chen	Research & HE	Cooperation between specialized cropping and livestock farms at local level reduces carbon footprint of agricultural system: A case study of recoupling maize-cow system in South China	2023	Agriculture, Ecosystems and Environment	China		1386.3	23.3		
Lecole	Research & HE	Economic and Environmental Performance of Small French Farms	2022	Revue d'Économie Régionale & Urbaine	France					
Lecole	Research & HE	Economic and Environmental Performance of Small French Farms	2022	Revue d'Économie Régionale & Urbaine	France					
Lima	Research & HE	Crop-Livestock Integration Improves Physical Soil, Agronomic and Environmental Aspects in Soybean Cultivation	2023	Plants	Brazil	731	1600	25		Typic Haplustox
Godinot	Research & HE	Relative nitrogen efficiency, a new indicator to assess crop livestock farming systems	2015	Agronomy for Sustainable Development	France, Italy				oceanic climate, subtropical wet climates emi-continental climate	cambisols, gleyic luvisols,haplic luvisols,rendzic leptosols
Mekuria	Tech Inst;Research & HE	Determinants of crop–livestock diversification in the mixed farming systems:evidence from central highlands of Ethiopia	2018	Agriculture & Food Security	Ethiopia					
Bos	Research & HE	Mixing specialised farming systems in Flevoland (The Netherlands): agronomic, environmental and socio-economic effects	1999	Netherlands Journal of Agricultural Science	Netherlands	Netherlands				calcareous marine loam soil
Godinot	Research & HE	Evidence of a rebound effect in agriculture: Crop-livestock reconnection beyond the farm gate does not always lead to more sustainable nitrogen management	2024	Agricultural Systems	Spain		345		Mediterranean semi-arid climate	Mediterranean semi-arid climate
Benoit	Research & HE	Greenhouse gases emissions and energy consumption on meat sheep production systems	2010	Renc. Rech. Ruminants	France					
Catarino	Research & HE; Tech Inst;Gov Agency;Research & HE	Fostering local crop-livestock integration via legume exchanges using an innovative integrated assessment and modelling approach based on the MAELIA platform	2021	Agricultural Systems	France			12.1		
Franke	R&D;NGO	Does crop-livestock integration lead to improved crop production in the savanna of West Africa?	2010	Expl Agric.	Nigeria		1050			
Moreau	Research & HE	Reconciling technical, economic and environmental efficiency of farming systems in vulnerable areas	2012	Agriculture, Ecosystems and Environment	France		950	11.7		
Artuzo	Research & HE	Agricultural systems design: Strategies for nutritionally oriented sustainable intensification	2025	Journal of Environmental Management	Brazil					
Prado	Research & HE; SA	Impact of different Brachiaria ruziziensis management practices in a crop-livestock integration system on soil health, soybean physiology, and yields	2025	Agriculture, Ecosystems and Environment	Brazil	756	1700	24.1		Quartzarenic Neosol,Entisol
Lima	Research & HE	Crop-livestock integration systems mitigate soil compaction and increase soybean yield	2025	Acta Scientiarum Agronomy	Brazil	731	1600	25		clayey texture or Typic Haplustox

Carey	Research & HE	Integrating poultry improves soil health and vegetable yield in organic, cover-cropped system	2025	Agriculture, Ecosystems and Environment	USA		909	9.7		
Pereyra-Goday	Research & HE;Gov Agency	Nitrogen use efficiency in mixed crop-livestock systems: insights for sustainable intensification	2025	Front. Sustain. Food Syst	Uruguay			17	subtropical climate	Oxyaquic Argiudolls
Bonacim	Tech Inst;Research & HE	Intercropping techniques improve pasture quality and beef cattle performance compared to livestock systems	2025	African Journal of Range & Forage Science	Brazil		150	25	humid tropical	clayey dystrophic Red Latosol
Denardin	Research & HE	Enhancing nitrogen use efficiency in paddy fields: The role of livestock integration and rice-soybean rotation	2025	Field Crops Research	Brazil	28	1522	18.3	Humid subtropical climate	Sandy clay loam texture
Davis	Research & HE; SA;Gov Agency	Soil health and ecological resilience of no-till, organic, and mixed-crop livestock systems in eastern Washington State	2025	Agriculture, Ecosystems and Environment	USA	802				Palouse silt loam
Tan	Research & HE	Emergy synthesis of decoupling and recoupling crop-livestock systems Under unified system boundary and modified indices	2023	Science of the Total Environment	China		1957.7	21.7	tropical monsoon climate	tropical monsoon climate
Bhattacharyya	Gov Agency	Effect of fish species on methane and nitrous oxide emission in relation to soil C, N pools and enzymatic activities in rainfed shallow lowland rice-fish farming system	2013	Agriculture, Ecosystems and Environment	India	24	1500			Aeric Endoaquept with sandy clay loam texture
Xu	Research & HE	Integrated rice-duck farming mitigates the global warming potential in rice season	2017	Science of the Total Environment	China		944.45	23.91	subtropical monsoon climate	subtropical monsoon climate
Datta	Gov Agency;Tech Inst	Methane and nitrous oxide emissions from an integrated rainfed rice–fish farming system of Eastern India	2009	Agriculture, Ecosystems and Environment	India	24	1500	27.7		Aeric Endoaquept with sandy clay loam texture
HU	Research & HE	The productivity of traditional rice–fish co-culture can be increased without increasing nitrogen loss to the environment	2013	Agriculture, Ecosystems and Environment	China		1432	17.5	subtropical monsoon	subtropical monsoon
Yang	Gov Agency;Research & HE	Characteristics of Growth and Yield Formation of Rice in Rice-Fish Farming System	2006	Agricultural Sciences in China	China		1000	15	North subtropical moisture climate	North subtropical moisture climate
Yuan	Research & HE	Methane and Nitrous Oxide Emissions from Rice-Duck and Rice-Fish Complex Ecosystems and the Evaluation of Their Economic Significance	2009	Agricultural Sciences in China	China					
Yuan	Research & HE	Methane and Nitrous Oxide Emissions from Rice-Duck and Rice-Fish Complex Ecosystems and the Evaluation of Their Economic Significance	2009	Agricultural Sciences in China	China					
Cheng-fang	Research & HE	Nitrogen losses from integrated rice–duck and rice–fish ecosystems in southern China	2008	Plant Soil	China	23	1220	16.7	humid mid-subtropical monsoon climate	humid mid-subtropical monsoon climate
Cheng-fang	Research & HE	Nitrogen losses from integrated rice–duck and rice–fish ecosystems in southern China	2008	Plant Soil	China	23	1220	16.7	humid mid-subtropical monsoon climate	humid mid-subtropical monsoon climate
Yang	Research & HE	Rice-duck co-culture for reducing negative impacts of biogas slurry application in rice production systems	2018	Journal of Environmental Management	China		1030	15.3	subtropical, monsoonal climate	subtropical, monsoonal climate
Oehme	Research & HE	Studies on nitrogen cycling under different nitrogen inputs in integrated rice-fish culture in Bangladesh	2007	Nutr Cycl Agroecosyst	Bangladesh		480	21.5		non-calcareous alluvial soil, clay loam
Zhan	Research & HE	Dynamics of methane emission, active soil organic carbon and their relationships in wetland integrated rice-duck systems in Southern China	2011	Nutr Cycl Agroecosyst	China	23	1220	16.7		
Teng	Research & HE;Gov Agency	Ecological effects of rice-duck integrated farming on soil fertility and weed and pest control	2016	J Soils Sediments	China	4	1356	16.8		
Xie	Research & HE	Chemical fertilizer reduction and soil fertility maintenance in rice–fish coculture system	2010	Front. Agric. China	China		1432	17.5		
Tsuruta	Gov Agency	Effect of fish in rice-fish culture on the rice yield	2011	Fish Sci	Japan	455	45	19.625		
Xie	Research & HE	Ecological mechanisms underlying the sustainability of the agricultural heritage rice–fish coculture system	2011	PNAS	China					

Das	Research & HE;Gov Agency	Economics of livestock-based farming systems in saline and normal areas of West Bengal: A comparative analysis	2023	Indian J Dairy Sci	India					
Battheu-Noirfalise	Research & HE	Influence of crop-livestock integration on direct and indirect contributions of beef systems to food security	2024	Agricultural Systems	Belgium					
Bellanger	Research & HE;Farmer;SA :NGO	Exploring nitrogen-flow networks and energy performance of contrasting organic farms	2025	Nutr Cycl Agroecosyst	France		700			
Matthews	Research & HE;Gov Agency	Legumes and livestock in no-till crop rotations: Effects on nitrous oxide emissions, carbon sequestration, yield, and wheat protein content	2025	Agricultural Systems	South Africa	191	395	18.2		
Aubron	Research & HE	Nitrogen metabolism of an Indian village based on the comparative agriculture approach: How characterizing social diversity was essential for understanding crop-livestock integration	2021	Agricultural Systems	India					
Dominschek	Research & HE	Crop rotations with temporary grassland shifts weed patterns and allows herbicide-free management without crop yield loss	2021	Journal of Cleaner Production	Brazil	890	1400	17.5		
Susilawati	Research & HE	Integrated crop-livestock management system in rainfed lowland	2021	IOP Conf. Series: Earth and Environmental Science	Indonesia					
Costa	SARL enterprise;Research & HE	A socio-eco-efficiency analysis of integrated and non-integrated crop-livestock-forestry systems in the Brazilian Cerrado based on LCA	2018	Journal of Cleaner Production	Brazil	810	1125	18		dark red latossol
Villela	SARL enterprise	Evolution of integrated crop-livestock and crop-livestock forestry systems in Brazil	2021	Conf paper	Brazil					
Liu	Research & HE; R&D;Tech Inst	Crop – Livestock integration via maize straw recycling increased carbon sequestration and crop production in China	2023	Agricultural Systems	China		601	12.1	warm continental monsoon climate	Fluvisols with sandy clay loamy texture
Veysset	Research & HE	Mixed crop–livestock farming systems: a sustainable way to produce beef? Commercial farms results, questions and perspectives	2014	Animal	France					
Sneessens	Research & HE;Gov Agency	Direct and indirect impacts of crop–livestock organization on mixed crop–livestock systems sustainability: a model-based study	2016	Animal	France					
Swarnam	Gov Agency;Research & HE	Climate smart crop-livestock integrated farming as a sustainable agricultural strategy for humid tropical islands	2024	International Journal of Agricultural Sustainability	India		3000	22		
Poffenbarger	Research & HE	An economic analysis of integrated crop-livestock systems in Iowa, U.S.A.	2017	Agricultural Systems	USA					
Salton	SARL enterprise;Gov Agency	Integrated crop-livestock system in tropical Brazil: Toward a sustainable production system	2014	Agriculture, Ecosystems and Environment	Brazil					Oxisol
Deiss	Research & HE;Gov Agency	Soil phosphorus compounds in integrated crop-livestock systems of subtropical Brazil	2016	Geoderma	Brazil	1100	1900	17.5		Oxisol
Moraine	Research & HE	A participatory method for the design and integrated assessment of crop-livestock systems in farmers' groups	2017	Ecological Indicators	France					
Sneessens	Research & HE	Effect of the lambing season on the ability of a mixed cropping and suckler sheep system to exploit economies of range: application in a French lowland area	2014	Thesis chapter	France					
Mirembe	Research & HE; Intergov org	Comparative effect of maize cultivation-cattle grazing rotation on selected ferrallitic soil properties and maize yield in the lake Victoria crescent	2020	Book Chapter	Uganda			22		
Ramesh	Research & HE	Optimizing soil, water and nutrient use efficiency in integrated cropping–livestock production system in Southern India	2020	Book Chapter	India					
Mutsamba-Magwaza	Research & HE; Intergov org	Learning from positive deviants' practices to improve the performance of mixed crop-livestock systems in Zimbabwe	2025	Agricultural systes	Zimbabwe	1075	550	21		
Ma	Research & HE	Mitigating environmental footprints via cooperation between the	2025	Agricultural systes	China					

		enterprise and specialized livestock farms in pig production							
Hercher-Pasteur	Research & HE; Tech Inst	Integrated crop-ruminant livestock systems as a strategy to increase energy, carbon and nutrient circularity: Exploring scenarios in dairy production systems across the southern hemisphere	2025	Agricultural systes	Uruguay				
Zhang	Research & HE	Long-term balanced organic and synthetic nitrogen fertilization can realize sustainable crop production	2026	Agricultural systes	China		540	13	
Djigbe	Research & HE	Implications of agroecological transition on performance and soil carbon inputs in farms from highly productive cashew zones of Benin	2026	Agricultural systes	Benin				
Chen	Research & HE	Dual-Path valorization of organic waste via black soldier fly: Synergistic enhancement of feed efficiency, crop quality, and climate mitigation in closed-loop aquaculture	2026	Waste Management	China				
Li	Research & HE	Long-term application of cattle manure alters functional N cycling genes and improves maize yield and nitrogen use efficiency	2025	Geoderma	China		550	1.5	
Silva	Research & HE	Spatial variability and microbiological and structural quality in sandy soil under managed functional diversity in integrated crop livestock systems	2026	Soil & Tillage Research	Brazil	312	1500	26.1	
Castro	Research & HE	Diverse production systems affect soil phosphorus forms and crop productivity in tropical soil	2026	Agriculture, Ecosystems and Environment	Brazil	312			
Ning	Gov Agency; Research & HE	Grazing mitigates soil GHG emissions while optimizes forage production of annual cereal grasses in an arid saline-alkali land	2025	Agricultural and Forest Meteorology	China		78	8.2	
Zhang	Research & HE	Can centralized manure management reduce nutrient losses from livestock-intensive lake basins?	2025	Journal of Cleaner Production	China		994	14.6	
Sha	Research & HE	Increased farm size combined with improved crop-livestock coupling enhance agricultural outputs while reducing environmental impacts	2025	Journal of Cleaner Production	China				
Arvadiya	Research & HE; Gov Agency	Purpose-wise diversification of component crops in rice-based cropping systems for enhancing productivity, soil health, income, family and livestock nutrition	2025	European Journal of Agronomy	India		1606		
Trumpp	Research & HE; Gov Agency	Integrating forage legumes reduces dependence on N fertilizer and increases the stability of grazing systems	2025	European Journal of Agronomy	USA				
Ghani	Gov Agency	Optimizing cutting and mix-cropping improves forage yield and quality of cultivated grassland in a semi-arid environment	2025	European Journal of Agronomy	China		110.7	7.79	
Simões	Gov Agency	System fertilization improves soil quality and increases primary production in an integrated crop-livestock system	2025	Journal of Integrative Agriculture	Brazil		1455	18.8	Subtropical
Bastos	Research & HE; SARL enterprise	Grazing intensities versus stocking methods: Implications for greenhouse gas emissions in integrated crop-livestock systems	2026	Journal of Agriculture and Food Research	Brazil				
Ning	Research & HE; Tech Inst	Assessing organic substitution thresholds in smallholder farms: Results from a 34-year experiment on crop—livestock integration systems	2026	European Journal of Agronomy	China				
Xu	Research & HE; Tech Inst	Interspecific competition, ecological benefits, and productivity in maize/alfalfa strip intercropping systems on the Loess Plateau of China	2025	Journal of Agriculture and Food Research	China				
Gupta	Gov Agency; Research & HE	Livelihood and energy-carbon dynamics of livestock-based integrated farming system: Assessment and implications for sustainable farming	2026	Farming System	India		908	25	
Danna	Research & HE	Animal Supplementation and Legume Pastures Enhance Nitrogen Balance and Efficiency in Integrated Crop-Livestock Systems	2025	Agriculture	India				
Senturklu	Research & HE	Effect of a Long-Term Integrated Multi-Crop Rotation and Cattle Grazing on No-Till Hard Red Spring	2025	Agriculture	USA				

		Wheat (Triticum aestivum L.) Production, Soil Health, and Economics								
Novakovic	Research & HE;Tech Inst	Does Agro-Eco Efficiency Matter? Introducing Macro Circular Economy Indicator into Profitability Modeling of Serbian Farms	2025	Agriculture	Serbia					
Acharya	Research & HE	Enhancing forage production and quality under resource-limited conditions by alfalfa–bermudagrass interseeding	2025	Agronomy Journal	USA					
Graham	Research & HE	Short-term effects of livestock on northern, semi-arid US Great Plains spring wheat grain yield	2025	Agronomy Journal	USA					
de Souza	Research & HE	Forage, carbon accumulation, and soil physical characteristics in a crop–livestock production system	2025	Crop Forage & Turfgrass Mgmt.	Brazil		1780	16.1		
Nan	Research & HE	Sustainability of Agropastoral Household Eco-Economic Systems: Integrated Assessment and Adaptive Management in Altay	2025	Ecosyst. Health Sustain	China					
Eismann	Tech Inst;Research & HE	Assessing Management Tools to Mitigate Carbon Losses Using Field-Scale Net Ecosystem Carbon Balance in a Ley-Arable Crop Sequence	2025	Atmosphere	Germany					
Girma	Tech Inst	Livestock manure for biogas and bioslurry production in practice	2025	Repport	Kenya					
Thakur		Sustainable integrated farming system model for enhancing profitability, resource efficiency, and soil health for smallholders in the Indian Mediterranean ecosystem of the North-Western Himalayan region	2025	Front. Sustain. Food Syst.	India					
Delandmeter	Research & HE	Livestock Integration Into Cropping Systems Enhances Their Climate Change Resistance and Mitigation While Reducing Their Environmental Impacts	2026	Global Change Biology	Belgium					
Hang	Intergov org;Tech Inst	Productivity impacts and Environmental trade-offs of Livestock-based systems in the Northern uplands of Lao PDR	2025	Repport	Lao	1200	1500		tropical	
Soder	Gov Agency; Research & HE	Integrating livestock and cropping systems: Interseeding cereal rye into corn for grazing	2025	Journal of Environmental Quality published	USA					
Rintzel	Research & HE	Impact of soil biochemical properties on yield and sustainability of integrated croplivestock production systems without mineral fertilization	2025	Rev Bras Cienc Solo.	Brazil	46	1500	19		
Delandmeter	Research & HE	Soil-crop feedbacks within contrasted cropping systems influence crop resistance to extreme climate events	2026	European Journal of Agronomy	Belgium					
Wang	Research & HE;Tech Inst;SARL enterprise	Production advantage of crop-ley pasture-livestock mixed farming over pure-cropping system under climate change	2025	Agronomy for Sustainable Development	Australia					
Hamlin	Tech Inst	Assesment of Social and Economic Impacts of Biogas Digesters in Rural Kenya	2012	Report	Kenya					
Fernandes	Research & HE	Crop-livestock integrated system and grass-legume intercropping on soil chemical composition and plant production in Brazilian savannah	2025	New Zealand Journal of Agricultural Research	Brazil	580	1613	24.4		
Delandmeter	Research & HE	Boosting ecosystem services and farm economics with crop diversity and livestock integration using a validated modeling approach	2025	PNAS Nexus	USA					
Nicola	Research & HE	Cattle grazing and anticipated potassium fertilization: impacts on soybean yield in integrated crop-livestock system under no-till	2025	Ciência Rural	Brazil		160	24		
de Assis	Research & HE	Nitrogen return in an integrated crop-livestock system with irrigation and forage legume	2025	Brazilian Animal Science	Brazil		1900			
Tovihoudji	Research & HE	Soil fertility, maize productivity, and nutrient use efficiency following different cattle corralling duration and mineral fertilizer application on a Lixisol in Benin	2025	Nutr Cycl Agroecosyst	Benin	365	1148	27.7	tropical sub-humid	Loamy sand
Atakoun	Research & HE	Soil carbon dynamics, nutrient enhancement, and maize productivity under traditional cattle corralling practices in northern Benin	2025	Nutr Cycl Agroecosyst	Benin					
Wang	Research & HE;Tech Inst	Optimizing the application of pig manure in crop rotation systems: A	2025	BMC Plant Biology	China		544	13.1		

		comprehensive assessment of crop yield, quality, and soil safety						
Möller	Research & HE	How to maintain soil fertility in stockless organic farming: Research concepts and insights from the first crop rotation of a long-term field experiment	2026	Org. Agr.	Germany			
Inacio	Research & HE	Soil organic matter and enzyme activity in tropical sandy soils under integrated and conventional land uses	2025	Soil Science Society of America Journal	Brazil			25.2
dos Reis	Research & HE;Tech Inst;Gov Agency	Integrated crop-livestock systems with crop diversification increase soil C levels and stocks in subtropical paddy fields in Brazil	2025	WP	Brazil	28	1500	18.3
M'Pangi	Research & HE	Impact de l'intégration cultures-élevages sur la multiperformance des agroé-cosystèmes Bio et Bio-like en Guadeloupe	2024	MSC thesis	France			
Evans	Research & HE	Evaluating circular practices in agriculture: A farm-level nitrogen and greenhouse gas marginal abatement cost curve approach	2026	Agriculture, Ecosystems and Environment	UK			
Assogba	Research & HE;Intergov org	Can low-input agriculture in semi-arid Burkina Faso feed its soil, livestock and people?	2023	European Journal of Agronomy	Burkina Faso	676		17
Evans	Research & HE	Residual Effects of Cover Crop Species, Tillage, and Manure Application on Corn Yield and Soil Nitrogen Dynamics in Organic Management Systems	2026	Agronomy	USA	420		
Xia	Research & HE	Research on Simulation and Structural Optimization of Integrated Crop–Livestock Systems in Jilin Province	2026	Systems	China		818.9	6.3
Conteratto	Research & HE	Low-carbon livestock strategies in the Brazilian Pampa biome: Insights from a life cycle comparison of native and integrated systems	2026	Science of the Total Environment	Brazil			
Assogba	Research & HE;Intergov org	Bridging gaps in agro-ecosystem integration: a multi-level modelling study in semi-arid Burkina Faso	2026	Ecological Modelling	Burkina Faso	676		17
Modernel	Research & HE	Ecological intensification in Río de la Platagrasslands	2015	Conf. Paper	Urugay			
Rimhanen	Research & HE	Net climate impacts of sustainable intensification measures in boreal Finnish crop-livestock system	2026	European Journal of Agronomy	Finland			
Jost	Tech Inst	Co-conception, évaluation et diffusion de systèmes de cultures répondant aux enjeux du changement climatique dans les élevages caprins de Nouvelle-Aquitaine et Pays de la Loire	2024	Conf. Paper	France			

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