

Annex 1. Agri-stack catalogue

#	ADS	Type	Country	End-user	Production	Crop/livestock	Organisation	TRL	Edge/Cloud	URL	Engagement	License	Stack layer	Component
1	Orchard bird scare machines	HW-based ADS	USA	Fruit growers	Farm management	Fruits	Farmhack user	6	Edge	https://farmhack.org/tools/orchard-bird-scare-machines	N/A	CC-BY-4.0	1.Hardware Infrastructure & Platforms	Agro machines
2	livestock weigh scales	HW-based ADS	USA	Farmers	Livestock weighing	Livestock	Farmhack User	5	Edge	https://farmhack.org/tools/livestock-weigh-scales	N/A	CC-BY-4.0	1.Hardware Infrastructure & Platforms	Agro machines
3	Waterer for rotational grazing	HW-based ADS	USA	Farmers	Grazing	Livestock	Farmhack User	5	Edge	https://farmhack.org/tools/water-rotational-grazing-0	N/A	CC-BY-4.0	1.Hardware Infrastructure & Platforms	Agro machines
4	Parametric cold-frame agrivoltaic systems	HW-based ADS	Canada	Farmers/Advisors	gardening in cold climates	Crops	Joshua Pierce	6	Edge	https://osf.io/k6xwv/	N/A	GNU General Public License (GPL) 3.0	1.Hardware Infrastructure & Platforms	Agro machines
5	Mobile Hop Picker	HW-based ADS	USA	Farmers	Harvesting	Crops	Farmhack User	7	Edge	https://farmhack.org/tools/mobile-mechanized-hops-harvester	N/A	CC-BY-4.0	1.Hardware Infrastructure & Platforms	Agro machines
6	Weedinator	HW-based ADS	UK	Farmers/Developers	Weed Control	Crops	Goat Industries	7	Edge	https://hackaday.io/project/53896-weedinator-2019	N/A	Software: GPLv3; Hardware: Creative Commons BY-SA	1.Hardware Infrastructure & Platforms	Agro machines
7	OpenScout	HW-based ADS	UK	Farmers/Developers	Farm management	Crops	GitHub user	7	Edge	https://github.com/cbedio/OpenScout	High	GPL-3.0 license	1.Hardware Infrastructure & Platforms	Robotics platforms
8	BeagleV Ahead	HW-based ADS	USA	Farmers/Developers	IoT integration	ALL	beaglev-ahead	6 - 7	Edge	https://git.beagleboard.org/beaglev-ahead/beaglev-ahead	N/A	CC-BY-4.0	1.Hardware Infrastructure & Platforms	Semiconductors

9	Smart Irrigation System with FC-28	Complete ADS	Universal	Farmers/Developers	Irrigation	Crops	GitHub user	5 - 6	Edge	https://github.com/deysarkarswarup/Smart-Irrigation-System	Low	Public Code	2. Sensing & capture	In-situ sensors
10	Agrosense	Complete ADS	Universal	Farmers/Advisors/Developers	Farm management	Crops	GitHub user	7	Mixed	https://github.com/HaroldMurcia/AgroSenseV1.0	Low	Public Code, No license specified	2. Sensing & capture	In-situ sensors
11	Compost Sensor	HW-based ADS	USA	Farmers	Irrigation/Compost	ALL	Farmhack user	5	Mixed	https://farmhack.org/tools/compost-sensor	N/A	CC-BY-4.0	2. Sensing & capture	In-situ sensors
12	Remote Compost Monitor	HW-based ADS	USA	Farmers	Irrigation/Compost	ALL	Farmhack user	5	Mixed	https://farmhack.org/tools/remote-compost-monitor	N/A	CC-BY-4.0	2. Sensing & capture	In-situ sensors
13	Wireless Field/Garden Sensor Node	HW-based ADS	USA	Farmers	Irrigation	ALL	Farmhack user	3 - 4	Edge	https://farmhack.org/tools/wireless-gardenfield-sensor-node	N/A	CC-BY-4.0	2. Sensing & capture	In-situ sensors
14	Chicken Coop Sensor	HW-based ADS	USA	Farmers	Chicken coops	Poultry	Farmhack user	3 - 4	Mixed	https://farmhack.org/tools/chicken-coop-sensor	N/A	CC-BY-4.0	2. Sensing & capture	In-situ sensors
15	Auto-fill High Output Temperature Controlled Humidifier	HW-based ADS	USA	Farmers	Indoor farming management	vegetables	Farmhack User	4 - 5	Edge	https://farmhack.org/tools/auto-fill-high-output-temperature-controlled-humidifier	N/A	CC-BY-4.0	2. Sensing & capture	In-situ sensors
16	Electronic Flame Weeder System	HW-based ADS	USA	Farmers	Mowing	ALL	Farmhack User	4	Edge	https://farmhack.org/tools/electronic-flame-weeder-system	N/A	CC-BY-4.0	2. Sensing & capture	In-situ sensors
17	Anavi Gardening UHAT	HW-based ADS	Bulgaria	Farmers	monitoring and growing plants	Plants	AnaviTechnology	6	Edge	https://github.com/AnaviTechnology/anavi-docs/tree/main/anavi-gardening-uhat	High	CC-BY-4.0	2. Sensing & capture	In-situ sensors
18	Baby groot	HW-based	Mexico	Farmers	Irrigation	Crops	GitHub user	6	Edge	https://github.com/Sxyther/Baby	Low	GPL v3.	2. Sensing & capture	In-situ sensors

		ADS								Groot v1-1/				
19	Vinduino soil moisture sensor station	HW-based ADS	USA	Farmers/Developers	Irrigation	Crops	GitHub user	7	Edge	https://github.com/Reiniervd/Vinduino	High	GPL-3.0 license	2. Sensing & capture	In-situ sensors
20	Green Detect	HW-based ADS	Italy	Farmers/Developers	Environmental monitoring	ALL	GitHub user	5 - 6	Edge	https://github.com/Greenbms/GreenDetect	Low	CC-BY-4.0	2. Sensing & capture	In-situ sensors
21	Phecda	HW-based ADS	Chile	Farmers/Developers	Fertilization	Crops	iowlabs	6	Edge	https://github.com/iowlabs/phecda	Low	Licenses	2. Sensing & capture	In-situ sensors
22	Twig	HW-based ADS	USA	Farmers/Developers	Irrigation/Soil Moisture	Crops	juniper-garden	6	Edge	https://github.com/juniper-garden/twig_temperature_humidity_sensor	Low	GPL-3.0 license	2. Sensing & capture	In-situ sensors
23	Rootmaster	HW-based ADS	Sweden	Farmers/Developers	Fertilization/Irrigation	Crops	openhydroponics	6 - 7	Edge	https://gitlab.com/openhydroponics/hw/rootmaster	N/A	CERN-OHL-W-2.0	2. Sensing & capture	In-situ sensors
24	Open Weather Station	HW-based ADS	Universal	Farmers/Developers	Climate data service	ALL	GitHub user	6 - 7	Edge	https://github.com/panchazo/open-weather-station	High	Apache 2 license	2. Sensing & capture	In-situ sensors
25	Livestocktracker	Complete ADS	Universal	Farmers/Developers	Livestock Monitoring	Livestock	GitHub user	5 - 6	Cloud	https://github.com/DigiBanks99/livestock-tracker	Low	Public Code	2. Sensing & capture	Livestock monitoring
26	BovHeat	Complete ADS	Universal	Farmers/Researchers	Heat Stress Monitoring in Cattle	Livestock	BovHEAT	5 - 6	Edge	https://github.com/bovheat/bovheat	Low	MIT license	2. Sensing & capture	Livestock monitoring
27	OpenWeedLocator	Complete ADS	Universal	Farmers/Advisors/Developers	Weed control	Crops	GitHub user	7	Cloud	https://github.com/geezacoleman/OpenWeedLocator	Very high	MIT license	2. Sensing & capture	Machine vision
28	BG0249_Depth AI_RGB_Camera	HW-based ADS	USA	Farmers/Developers	IoT integration	ALL	luxonis	6 - 7	Edge	https://github.com/luxonis/depth-ai-hardware/tree/master/BG0249	N/A	MIT	2. Sensing & capture	Machine vision

										DepthAI RGB Camera				
29	Field Book	Complete ADS	Universal / US-origin	Plant breeders / researchers / field technicians	Field phenotyping / plot observations	Crops	PhenoApps	8	Edge / mobile	https://github.com/PhenoApps/Field-Book	High	GPL-2.0	2. Sensing & capture	Machine vision
30	EnviroDIY ModularSensors	HW-based ADS	Universal / US-origin	Researchers / environmental monitoring teams / makers	Sensor deployment / environmental monitoring	Crops / soil / water	Stroud Water Research Center / EnviroDIY	7	Edge / mixed	https://github.com/EnviroDIY/ModularSensors	High	CERN-OHL-1.2	2. Sensing & capture	Machine vision
31	Iguana	HW-based ADS	Chile	Farmers/ Developers	Irrigation/ Soil Moisture	ALL	iowlabs	7	Edge	https://github.com/iowlabs/Iguana	Low	Licenses	2. Sensing & capture	In-situ sensors
32	Farm Data Relay System	Complete ADS	Universal	Farmers/ Advisors/ Developers	Broadband Connectivity	ALL	GitHub user	7	Cloud	https://github.com/timmbogner/Farm-Data-Relay-System	Very high	MIT license	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT
33	MAVSDK	ADS components - IoT & data	Universal	UAV application developers / integrators	Drone control / telemetry / mission automation	Crops	MAVLink / Dronecode community	8	Edge / mixed	https://github.com/mavlink/MAVSDK	Very high	BSD-3-Clause	3. Connectivity & Edge	Network management
34	ChirpStack	ADS components - IoT & data	Universal	IoT developers / integrators / farm operators	Sensor connectivity / telemetry	Crops / livestock	ChirpStack community	9	Cloud / edge / mixed	https://github.com/chirpstack/chirpstack	Very high	MIT	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT
35	The Things Stack	ADS components - IoT & data	Universal	IoT developers / integrators / farm operators	Sensor connectivity / telemetry	Crops / livestock	The Things Industries / community	9	Cloud / edge / mixed	https://github.com/TheThingsNetwork/lorawan-stack	Very high	Apache-2.0	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT

36	IOT agointelligence lorawan node	HW-based ADS	Portugal	Farmers/ Developers	Farm management	ALL	GitHub user	6	Edge	https://github.com/antoniovalente/loT-AgroIntelligence-Node	Low	CERN Open Hardware	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT
37	Colubris LoRa Meteorological Station Board	HW-based ADS	Brazil	Farmers/ Developers	Weather data service	ALL	embarcacoes	5 - 6	Edge	https://gitlab.com/embarcacoes/estacao-metereologica-lorawan/	N/A	CERN Open Hardware	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT
38	HidroIoT	HW-based ADS	Guatemala	Farmers/ Developers	Irrigation	Crops	GitHub user	4 - 5	Edge	https://github.com/AlisonReuena/Hidro_IOT?tab=readme-ov-file	Low	Hardware: CERN-OHL-P-2 Software: GPL-3	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT
39	Fiware - Cosmos	ADS components - IoT & data	Universal	Developers	IOT integration	ALL	FIWARE Foundation	6	Cloud	https://github.com/telefonicaid/fiware-cosmos?tab=AGPL-3.0-1-ov-file#readme	High	AGPL-3.0 license	3. Connectivity & Edge	Network management
40	Fiware - ORION	ADS components - IoT & data	Universal	Developers	IOT integration	ALL	FIWARE Foundation	6	Cloud	https://github.com/telefonicaid/fiware-orion	High	AGPL-3.0 license	3. Connectivity & Edge	Network management
41	Nordic sdk	HW-based ADS	Universal	Farmers/ Developers	IoT integration	ALL	nrfconnect	8 - 9	Mixed	https://github.com/nrfconnect/sdk-nrf	Very high	LicenseRef-Nordic-5-Clause	3. Connectivity & Edge	Network management
42	FROST-Server	ADS components - IoT & data	Universal / EU-origin	IoT developers	Sensor observation storage and exchange	Crops / livestock	Fraunhofer IOSB	8 - 9	Cloud / mixed	https://github.com/FraunhoferIOSB/FROST-Server	High	LGPL-3.0-or-later	3. Connectivity & Edge	Edge computing
43	ArduPilot	HW-based ADS	Universal	UAV / rover developers	Aerial or ground monitoring / spraying / mapping	Crops	ArduPilot community	9	Edge	https://github.com/ArduPilot/ardupilot	Very high	GPL-3.0	3. Connectivity & Edge	Edge computing

44	PX4 Autopilot	HW-based ADS	Universal	UAV developers	Aerial monitoring / spraying / mapping	Crops	Dronecode Foundation / PX4 community	9	Edge	https://github.com/PX4/PX4-Autopilot	Very high	BSD-3-Clause	3. Connectivity & Edge	Edge computing
45	EODAG	ADS components - IoT & data	Universal / EU-origin	Researchers	Earth observation	Crops / land use	CS Group / EODAG community	8	Cloud / mixed	https://github.com/CS-SI/eodag	High	Apache-2.0	3. Connectivity & Edge	Network management
46	AglsoStack++	ADS components - farm MGT	Universal	Developers/ Farmers	Interoperability	Crops	Open-Agriculture	5	Edge	https://github.com/Open-Agriculture/AglsoStack-plus-plus	High	MIT license	3. Connectivity & Edge	Edge computing
47	AglsoStack-Arduino	ADS components - farm MGT	Universal	Developers/ Farmers	Interoperability	Crops	Open-Agriculture	5	Edge	https://github.com/Open-Agriculture/AglsoStack-Arduino	Low	MIT license	3. Connectivity & Edge	Edge computing
48	FarmVibes.Edge	ADS components - farm MGT	Universal	Farmers/ Advisors/ Developers	Edge data-processing connected to drones	Crops	Microsoft	7	Edge	https://www.microsoft.com/en-us/research/project/project-farmvibes/article/s/farmvibes-edge/	N/A	No license specified	3. Connectivity & Edge	Edge computing
49	FarmVibes.Connect	ADS components - farm MGT	Countries where unused TV spectrum is legal	Farmers/ Advisors/ Developers	Broadband Connectivity	Crops	Microsoft	7	Mixed	https://www.microsoft.com/en-us/research/project/project-farmvibes/article/s/farmvibes-connect/	N/A	Not yet available on github/ No license specified	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT
50	ODK Central	3 - ADS components - IoT & data	Universal	Field technicians / researchers / NGOs / farmers	Field data collection / surveys / inspections	Crops / livestock	ODK community	8 - 9	Cloud / on-premise	https://github.com/getodk/central	Very high	Apache-2.0	4. Data & intelligence	Big data and storage
51	FIWARE Smart	3 - ADS	Universal	Developers	Data	Crops /	Smart	8	Cloud /	https://github.com	High	Open	4. Data &	Big data

	Data Models - Agrifood	components - IoT & data	EU-origin	rs / public administrations / platform integrators	integration / interoperability	livestock	Data Models Programme / FIWARE community		mixed	m/smart-data-models/dataModel.Agrifood		per-model licences; commonly BSD-style	intelligence	and storage
52	Agstack Pest models	Complete ADS	Universal	Farmers/ Advisors/ Developers	Pest management	Crops	Linux Foundation	5	Cloud	https://github.com/agstack/pest-models	Low	GPL-3.0 license	4. Data & intelligence	AI / Machine Learning
53	Insect Detect	Complete ADS	Universal	Farmers/ Advisors	Pest management	Crops	GitHub user	6 - 7	Mixed	https://github.com/maxsitt/insect-detect	High	GPL-3.0 license	4. Data & intelligence	AI / Machine Learning
54	Wadhvani AI Pest Management	Complete ADS	India-focused	Farmers	Pest management	Cotton	Wadhvani Institute for Artificial Intelligence	7 - 8	Mixed	https://github.com/WadhvaniAI/pest-management-opendata	Low	Apache-2.0 license	4. Data & intelligence	AI / Machine Learning
55	Insect Detection on Sticky Traps	Complete ADS	Universal	Developers	Pest Management	Crops	GitHub user	5 - 6	Edge	https://github.com/checolag/insect-detection-scripts	Low	Public Code, No license specified	4. Data & intelligence	AI / Machine Learning
56	Advanced Pest Detection System	Complete ADS	Universal	Farmers/ Advisors	Pest Management	Crops	GitHub user	6 - 7	Mixed	https://github.com/Ali-Rizvi-1/advanced_pest_detection	Low	GPL-3.0 license	4. Data & intelligence	AI / Machine Learning
57	Pest Classification and Detection System	Complete ADS	Universal	Developers	Pest Management	Crops	https://github.com/nikh-iam	6 - 7	Edge	https://github.com/NikhilAMathew/Pest-Classification-and-Detection-System-using-Deep-Learning	Low	Public Code, No license specified	4. Data & intelligence	AI / Machine Learning
58	Pest Detection using Deep Learning	Complete ADS	Universal	Developers	Pest Management	Crops	GitHub user	5 - 6	Edge	https://github.com/shivam1423/Pest-detection	High	Public Code, No license specified	4. Data & intelligence	AI / Machine Learning

59	Agricultural Pests Management	Complete ADS	Universal	Farmers/Developers	Pest Management	Crops	GitHub user	5 - 6	Mixed	https://github.com/rahulkundelwal/Agri-cultural-Pests-management	Low	Public Code, No license specified	4. Data & intelligence	AI / Machine Learning
60	HerdNet	Complete ADS	Universal	Farmers, Researchers	Livestock Monitoring & Tracking	Livestock	GitHub user	5 - 6	Edge	https://github.com/Alexandre-Delplanque/HerdNet	Low	MIT license	4. Data & intelligence	AI / Machine Learning
61	LiveStock	Complete ADS	Universal	Farmers/Developers	Livestock Management	Livestock	GitHub user	5 - 6	Cloud	https://github.com/pedroenriquedev/LiveStock	Low	Public Code, No license specified	4. Data & intelligence	AI / Machine Learning
62	Pig Weight Estimation (Pixel Occupancy Analysis)	Complete ADS	Universal	Farmers/Researchers	Livestock Monitoring	Livestock (Pigs)	GitHub user	5 - 6	Edge	https://github.com/nikmomo/Pig-Weight-Estimation-Pixel-Occupancy-Analysis	Low	GPL-3.0 license	4. Data & intelligence	AI / Machine Learning
63	Ryax- engine	ADS components - IoT & data	Universal	Developers	Data Processing and Analytics	ALL	Ryax technologies	5	Cloud	https://github.com/RyaxTech/ryax-engine?tab=readme-ov-file	High	MPL-2.0 license	4. Data & intelligence	AI / Machine Learning
64	FarmBot	HW-based ADS	USA	Farmers	Small Farms/Gardens management	ALL	FarmBot	9	Mixed	https://github.com/FarmBot-Docs/farmbot-genesis	High	Licenses	4. Data & intelligence	AI / Machine Learning
65	Grower Bot	HW-based ADS	USA	Farmers	Irrigation	ALL	GitHub user	5	Mixed	https://github.com/liseman/growerbot	High	CC-BY-4.0	4. Data & intelligence	AI / Machine Learning
66	Rastervision	ADS components - IoT & data	Universal	Developers	Map service	Crops	azavea	7	Cloud	https://github.com/azavea/raster-vision	Very high	Apache 2 license	4. Data & intelligence	AI / Machine Learning
67	QGIS	ADS components -	Universal	Developers	Map service	ALL	QGIS Development	9	Cloud	https://qgis.org/en/site/	Very high	GNU GENERAL PUBLIC	4. Data & intelligence	Big data and storage

		IoT & data					Team					LICENSE		
68	HSlayers NG	ADS components - IoT & data	Universal	Developers	Map service	Crops	hslayers	4	Cloud	https://github.com/hslayers/hslayers-ng	Low	MIT license	4. Data & intelligence	Big data and storage
69	(Open)Micka	ADS components - IoT & data	Universal	Developers	Map service	Crops	hsrcz	4	Cloud	https://github.com/hsrcz/Micka	Low	BSD-3-Clause license	4. Data & intelligence	Big data and storage
70	Geoserver	ADS components - IoT & data	Universal	Developers	Map service	ALL	geoserver	9	Cloud	https://github.com/geoserver/geoserver	Very high	GNU General Public License Version 2.0 license	4. Data & intelligence	Big data and storage
71	Postgres	ADS components - IoT & data	Universal	Developers	Data Processing and Analytics	ALL	PostgreSQL	7	Hybrid	https://github.com/postgres/postgres	Very high	License	4. Data & intelligence	Big data and storage
72	Soilmate	ADS components - farm MGT	Universal	Farmers/ Advisors/ Developers	Fertilization/ Irrigation	Crops	Open-Source-Agriculture	7	Cloud	https://github.com/Open-Source-Agriculture/soil_Iogr	Low	GPL-3.0 license	4. Data & intelligence	Big data and storage
73	AquaCrop-OSPy	3 - ADS components - IoT & data	Universal	Agronomists / researchers / developers	Irrigation / yield modelling / decision support	Crops	AquaCrop-OSPy community	7 - 8	Cloud / edge workstation	https://github.com/aquacrop/aquacrop	High	Apache-2.0	4. Data & intelligence	Big data and storage
74	Temperature Data Logger	HW-based ADS	USA	Farmers	Farm management	ALL	Farmhack user	6	Edge	https://farmhack.org/tools/temperature-data-logger	N/A	CC-BY-4.0	4. Data & intelligence	Data platforms
75	AgStack Asset Registry 1.0/2.0	Complete	Universal	Farmers/ Advisors/	Farm management	Crops	Linux Foundation	5	Cloud	https://github.com/agstack/asset	High	Public Code,	4. Data & intelligence	Data platforms

		ADS		Developers	ment		n			-registry		No license specified		
76	Agstack Weather Server	Complete ADS	Universal	Farmers/Advisors/Developers	Farm management	Crops	Linux Foundation	5	Cloud	https://github.com/agstack/weather-server	High	Apache-2.0 license	4. Data & intelligence	Data platforms
77	OpeanAgri weather-service	Complete ADS	Universal	Farmers/Advisors/Developers	Farm management	Crops/Livestock	OpenAgri		Mixed	https://github.com/openagri-eu/weather-service	N/A	EUPL-1.2 license	4. Data & intelligence	Data platforms
78	Farmtopia data exchange module	ADS components - farm MGT	Universal	Developers	Agricultural data sharing	ALL	Farmtopia project	6	Cloud	https://gitlab.com/Farmtopia/data-exchange	Low	Public Code, No license specified	4. Data & intelligence	Data platforms
79	OpenFarm	ADS components - farm MGT	Universal	Farmers/Advisors/Developers	Farming & Gardening knowledge	Crops/Plants	openfarm cc	7	Cloud	https://github.com/openfarmcc/OpenFarm	Very high	MIT license	4. Data & intelligence	Data platforms
80	ADAPT toolkit	ADS components - farm MGT	Universal	Developers/Farmers	Interoperability	Crops	Ag Gateway	7	Edge	https://github.com/ADAPT	High	EPL-1.0 license	4. Data & intelligence	Data platforms
81	Agroclimatology	ADS components - farm MGT	Universal	Developers	Climate data service	Crops	GitHub user	5	Cloud	https://github.com/brycejohnston/agroclimatology	Low	MIT license	4. Data & intelligence	Data platforms
82	Cotton Phenology Dataset	ADS components - farm MGT	Greece	Developers/Researchers	Farm Management (Crop Phenology Monitoring)	Cotton	Agri-Hub	6	Cloud	https://github.com/Agri-Hub/cotton-phenology-dataset	Low	Public Code	4. Data & intelligence	Data platforms
83	OpenAgri CSM	ADS compo	Universal	Developers	Farm manage	ALL	OpenAgri		Mixed	https://github.com/openagri-	N/A	EUPL-1.2 license	4. Data & intelligence	Data platforms

		nents - farm MGT			ment					eu/OCSM				
84	Fiware - Wilma	ADS compo nents - IoT & data	Universa l	Develope rs	IOT integratio n	ALL	FIWARE Foundatio n	6	Cloud	https://github.com/FIWARE-GEs/wilma	High	MIT license	4. Data & intelligence	Data platforms
85	Fiware - Backend Device Management - IDAS	ADS compo nents - IoT & data	Universa l	Develope rs	IOT integratio n	ALL	FIWARE Foundatio n	6	Cloud	https://github.com/FIWARE/catalogue/blob/master/iot-agents/README.md	High	AGPL-3.0 license	4. Data & intelligence	Data platforms
86	Fiware - Keyrock	ADS compo nents - IoT & data	Universa l	Develope rs	IOT integratio n	ALL	FIWARE Foundatio n	6	Cloud	https://github.com/ging/fiware-idm	High	MIT license	4. Data & intelligence	Data platforms
87	InfluxDB	ADS compo nents - IoT & data	Universa l	Develope rs	Data Processing and Analytics	ALL	InfluxData	7	Mixed	https://github.com/influxdata/influxdb	Very high	Apache- 2.0, MIT	4. Data & intelligence	Data platforms
88	Note-Red	ADS compo nents - IoT & data	Universa l	Develope rs	IOT integratio n	ALL	node-red	7	Mixed	https://github.com/node-red/node-red	Very high	MIT license	4. Data & intelligence	Data platforms
89	Grafana	ADS compo nents - IoT & data	Universa l	Develope rs	Data Processing and Analytics	ALL	Grafana labs	7	Cloud	https://github.com/grafana/grafana	Very high	AGPL-3.0 license	4. Data & intelligence	Data platforms
90	MongoDB	ADS compo nents - IoT & data	Universa l	Develope rs	Data Processing and Analytics	ALL	Streamlit	7	Cloud	https://github.com/mongodb/mongo	Very high	https://github.com/mongodb/mongo?tab=License-1-over-file#read	4. Data & intelligence	Data platforms

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91	Zenoh	ADS components - IoT & data	Universal	Developers	IOT integration	ALL	eclipse-zenoh	7	Cloud	https://github.com/eclipse-zenoh/zenoh	Very high	https://github.com/eclipse-zenoh/zenoh?tab=License-1-ov-file#readme	4. Data & intelligence	Data platforms
92	Mosquitto	ADS components - IoT & data	Universal	Developers	IOT integration	ALL	Eclipse Mosquitto	7	Hybrid	https://github.com/eclipse-mosquitto/mosquitto	Very high	Eclipse Public License 2.0 and the Eclipse Distribution License 1.0	4. Data & intelligence	Data platforms
93	FreeRTOS	ADS components - IoT & data	Universal	Developers	IOT integration	ALL	FreeRTOS	7	Edge	https://github.com/FreeRTOS/FreeRTOS	Very high	MIT license	4. Data & intelligence	Data platforms
94	Minio	ADS components - IoT & data	Universal	Developers	Data Processing and Analytics	ALL	MinIO	7	Hybrid	https://github.com/minio/minio	Very high	AGPL-3.0 license	4. Data & intelligence	Data platforms
95	Streamlit	ADS components - IoT & data	Universal	Developers	Data Processing and Analytics	ALL	Streamlit	7	Hybrid	https://github.com/streamlit/streamlit	Very high	Apache-2.0 license	4. Data & intelligence	Data platforms
96	ThingsBoard - Open-source IoT Platform	ADS components - IoT & data	Universal	Developers	IOT integration	ALL	ThingsBoard	9	Cloud	https://github.com/thingsboard/thingsboard	Very high	Apache v2.0	4. Data & intelligence	Data platforms
97	Prometheus	ADS	Universal	Developers	Data	ALL	Promethe	9	Cloud	https://github.com	Very	Apache-	4. Data &	Data

		components - IoT & data	I	rs	Processing and Analytics		us			m/prometheus/prometheus	high	2.0 license	intelligence	platforms
98	Senslog	ADS components - IoT & data	Universa	Develope	IOT integration	ALL	GitHub user	6	Cloud	https://github.com/mkepka/senslog	Low	BSD 3-Clause License	4. Data & intelligence	Data platforms
99	GSODR	ADS components - IoT & data	Universa	Develope	Climate data service	Crops	ropensci	5	Cloud	https://github.com/ropensci/GSODR	High	MIT license	4. Data & intelligence	Data platforms
100	Open Meteo	ADS components - IoT & data	Universa	Develope	Climate data service	ALL	open-meteo	9	Cloud	https://github.com/open-meteo/open-meteo	Very high	AGPL-3.0 license	4. Data & intelligence	Data platforms
101	WeeWX- Open-source software for your weather station	ADS components - IoT & data	Universa	Develope	Climate data service	ALL	weewx	9	Cloud	https://github.com/weewx/weewx	Very high	GPL-3.0 license	4. Data & intelligence	Data platforms
102	Open Ag component: OpenATK Tillage App	ADS components - farm MGT	Universa	Farmers/ Advisors/ Develope	Farm management	Crops	OpenATK	5	Cloud	https://github.com/OpenATK/Tillage	N/A	Public Code	4. Data & intelligence	Digital twins
103	Open Ag component: OpenATK Rock App	ADS components - farm MGT	Universa	Farmers/ Advisors/ Develope	Farm management	Crops	OpenATK	5	Cloud	https://github.com/OpenATK/TheRockApp	N/A	Public Code	4. Data & intelligence	Digital twins
104	Open Ag component: OpenATK Soil mapping	ADS components - farm MGT	Universa	Farmers/ Advisors/ Develope	Farm management	Crops	OpenATK	5	Cloud	https://github.com/OpenATK/soils-mapping	Low	Public Code	4. Data & intelligence	Digital twins
105	Open Ag component:	ADS compo	Universa	Farmers/ Advisors/	Farm manage	Crops	OpenATK	5	Cloud	https://github.com/OpenATK/Fiel	Low	Public Code	4. Data & intelligence	Digital twins

	OpenATK Field Work App	nents - farm MGT		Developers	ment					dWorkApp				
106	Open Ag component: OpenATK Field Manure App	ADS components - farm MGT	Universal	Farmers/ Advisors/ Developers	Farm management	Livestock	OpenATK	5	Cloud	https://github.com/OpenATK/ManureApp	Low	Public Code	4. Data & intelligence	Digital twins
107	Open Ag component: OpenATK Harvest progress viewer	ADS components - farm MGT	Universal	Farmers/ Advisors/ Developers	Farm management	Crops	OpenATK	5	Cloud	https://github.com/OpenATK/HarvestProgressViewer	Low	Public Code	4. Data & intelligence	Digital twins
108	Agstack Field Carbon model	Complete ADS	Universal	Farmers/ Advisors/ Developers	Fertilization	Crops	Linux Foundation	5	Cloud	https://github.com/agstack/field-carbon-model	High	Apache-2.0 license	4. Data & intelligence	Digital twins
109	BioMA (Biophysical Model Applications)	Complete ADS	EU-focused	Developers	Pest Management	Crops	CREA - Council for Agricultural Research	7 - 8	Mixed	https://quantitative-plant.org/model/BioMA	N/A	Public Code	4. Data & intelligence	Digital twins
110	EdgeX Foundry	ADS components - IoT & data	Universal	Developers	IOT integration	ALL	Linux Foundation	5	Cloud	https://github.com/edgexfoundry/	Very high	Apache-2.0 license	4. Data & intelligence	Digital twins
111	eKuiper	ADS components - IoT & data	Universal	Developers	IOT integration	ALL	Linux Foundation	5	Cloud	https://github.com/lfe-edge/ekuiper	Very high	Apache-2.0 license	4. Data & intelligence	Digital twins
112	NanoMQ	ADS components - IoT & data	Universal	Developers	IOT integration	ALL	Linux Foundation	5	Cloud	https://github.com/nanomq/nanomq	Very high	MIT license	4. Data & intelligence	Digital twins
113	Open Data Cube	ADS components -	Universal / strong public-	Researchers / public	Earth observation analysis	Crops / land use	Open Data Cube	8 - 9	Cloud / mixed	https://github.com/opendatacube-	High	Apache-2.0	4. Data & intelligence	Big data and storage

		IoT & data	sector adoption	administrations / developers	/ monitoring		community			core				
114	eo-learn	ADS components - IoT & data	Universal / EU-origin	Data scientists / researchers / developers	Earth observation analysis / prediction	Crops / land use	Sentinel Hub community	7 - 8	Cloud / mixed	https://github.com/sentinel-hub/eo-learn	High	MIT	4. Data & intelligence	AI / Machine Learning
115	MONICA	ADS components - IoT & data	EU / Universal	Agronomists / researchers / developers	Crop growth / soil / climate modelling	Crops	Leibniz Centre for Agricultural Landscape Research (ZALF)	8	Cloud / mixed	https://github.com/zalf-rpm/monica	Medium	MPL-2.0	4. Data & intelligence	Digital twins
116	FarmVibes.AI	ADS components - farm MGT	Universal	Farmers/ Advisors/ Developers	Farm management	Crops	Microsoft	7	Cloud	https://github.com/microsoft/farmvibes-ai	N/A	MIT license	4. Data & intelligence	AI / Machine Learning
117	AgML	ADS components - farm MGT	Universal	Developers	ALL	ALL	Project-AgML	7	Cloud	https://github.com/Project-AgML/AgML	High	Apache-2.0 license	4. Data & intelligence	AI / Machine Learning
118	Crop yield Prediction	ADS components - farm MGT	Universal	Farmers/ Advisors/ Developers	Farm management	Crops	GitHub user	5	Cloud	https://github.com/JiaxuanYou/crop_yield_prediction	Very high	Public Code	4. Data & intelligence	AI / Machine Learning
119	FarmVibes.Bot	ADS components - farm MGT	Universal/in use in subhara n Africa	Farmers/ Advisors/ Developers	Farm management/Communication	Crops	Microsoft	7	Cloud	https://www.microsoft.com/en-us/research/project/project-farmvibes/article/farmvibes-bot/	N/A	No license specified	4. Data & intelligence	AI / Machine Learning
120	Eclipse Dataspace Components	ADS components -	Universal / EU data-	Data-space operators	Controlled data sharing /	Crops / livestock / supply	Eclipse Foundation / EDC	7 - 8	Cloud / mixed	https://github.com/eclipse-edc/Connector	Very high	Apache-2.0	4. Data & intelligence	Data platforms

	(EDC) Connector	IoT & data	space relevance	/ developers	data spaces	chains	community							
121	WebODM	Complete ADS	Universal	Farmers / agronomists / UAV operators / researchers	Monitoring / mapping / crop scouting	Crops	WebODM community	8 - 9	Cloud / on-premise	https://github.com/WebODM/WebODM	Very high	AGPL-3.0	5. Decision & automation	Decision dashboards
122	OpenDroneMap (ODM)	ADS components - IoT & data	Universal	Developers / UAV operators / researchers	Monitoring / mapping / crop scouting	Crops	OpenDroneMap community	8	Cloud / edge workstation	https://github.com/OpenDroneMap/ODM	Very high	AGPL-3.0	5. Decision & automation	Decision dashboards
123	TerraTorch	ADS components - IoT & data	Universal	Data scientists / researchers / developers	Monitoring / classification / prediction	Crops / land use	TorchGeo / IBM Research community	6 - 7	Cloud	https://github.com/torchgeo/torchgeo	High	Apache-2.0	5. Decision & automation	Decision dashboards
124	TorchGeo	ADS components - IoT & data	Universal	Data scientists / researchers	Monitoring / classification / prediction	Crops / land use	TorchGeo community	7 - 8	Cloud / mixed	https://github.com/torchgeo/torchgeo	Very high	MIT	5. Decision & automation	Decision dashboards
125	Purdue AgIoT	Complete ADS	Universal	Farmers/ Developers/	Irrigation	Crops	Purdue University	5 - 6	Mixed	https://github.com/2021-Thomas/Thomas_Mayday	Low	Public Code, No license specified	5. Decision & automation	Automated actuation
126	Automated Irrigation System	Complete ADS	Universal	Farmers/ Developers	Irrigation	Crops	GitHub user	5 - 6	Edge	https://github.com/PatrickHallek/automated-irrigation-system	Very high	MIT license	5. Decision & automation	Automated actuation
127	SIP (Sustainable Irrigation Platform)	Complete ADS	Universal	Farmers/ Developers	Irrigation	Crops	GitHub user	6 - 7	Edge	https://github.com/Dan-in-CA/SIP	Very high	GNU GPL License	5. Decision & automation	Automated actuation
128	OpenSprinkler	Complete	Universal	Farmers/ Developers	Irrigation	Crops	OpenSprinkler	7 - 8	Edge	https://github.com/OpenSprinkler	Very high	GPL-3.0	5. Decision & automation	Automated

		ADS		rs						/OpenSprinkler-App				actuation
129	Smart Irrigation Controller	Complete ADS	Universal	Farmers/Developers	Irrigation	Crops	GitHub user	5 - 6	Edge	https://github.com/GerruG/Smart-Irrigation-Controller	Low	Public Code, No license specified	5. Decision & automation	Automated actuation
130	IoT-Based Smart Irrigation System	Complete ADS	Universal	Farmers/Developers	Irrigation	Crops	GitHub user	5 - 6	Cloud	https://github.com/jatingarwl/IOT-Based-Smart-Irrigation-System	Low	Public Code, No license specified	5. Decision & automation	Automated actuation
131	RoboRiego IoT Irrigation System	Complete ADS	Universal	Farmers/Developers	Irrigation	Crops	GitHub user	5 - 6	Mixed	https://github.com/alexagonluc16/RoboRiego_IoT_Irrigation_System	Low	Apache-2.0 license	5. Decision & automation	Automated actuation
132	GardenPI	Complete ADS	Universal	Farmers	Irrigation	Home gardens	GitHub user	5 - 6	Edge	https://github.com/ankitr42/gardenpi	High	MIT license	5. Decision & automation	Automated actuation
133	Pirigo	Complete ADS	Universal	Farmers/Developers	Irrigation	Crops	GitHub user	6 - 7	Edge	https://github.com/vacovsky/pirigo	High	MIT license	5. Decision & automation	Automated actuation
134	Moisture Monitor	Complete ADS	Universal	Farmers/Developers	Irrigation	Crops	GitHub user	5 - 6	Edge	https://github.com/AbhijnanPrakash/Moisture-monitor	Low	Public Code, No license specified	5. Decision & automation	Automated actuation
135	Irrigation-Pi	Complete ADS	Universal	Farmers/Developers	Irrigation	Crops	GitHub user	6 - 7	Edge	https://github.com/max-pfeiffer/irrigation-pi	Low	MIT license	5. Decision & automation	Automated actuation
136	Irrigation Controller	Complete ADS	Universal	Farmers/Developers	Irrigation	Crops	GitHub user	6 - 7	Edge	https://github.com/mwick83/irrigation_ctrl	Low	BSD-3-Clause	5. Decision & automation	Automated actuation
137	Open-Rain	Complete ADS	Universal	Farmers	Irrigation	Crops	GitHub user	5 - 6	Edge	https://github.com/eloidalonso/open-rain	Low	GPL-3.0 license	5. Decision & automation	Automated actuation
138	IrrigationSystem	Complete	Universal	Farmers/Developers	Irrigation	Crops	GitHub user	5 - 6	Edge	https://github.com/blsd1512/Irrig	Low	Public Code,	5. Decision & automation	Automated

		ADS		rs						ationSystem		No license specified		actuation
139	ESP32 Automatic Irrigation API	Complete ADS	Universal	Farmers/Developers	Irrigation	Crops	GitHub user	6 - 7	Edge	https://github.com/lsacco-B/esp32-automatic-irrigation-api	Low	Public Code, No license specified	5. Decision & automation	Automated actuation
140	IoTGreenGuardian Agriculture Automation System	Complete ADS	Universal	Farmers/Developers	Irrigation	Crops	GitHub user	5 - 6	Cloud	https://github.com/roycuadra/IoT-GreenGuardian-Agriculture-Automation-System	Low	Public Code, No license specified	5. Decision & automation	Automated actuation
141	Smart Irrigation System using ML and IoT	Complete ADS	Universal	Farmers/Developers	Irrigation	Crops	GitHub user	5 - 6	Cloud	https://github.com/Avdhesh616/Smart-Irrigation-system-using-ML-and-IoT	Low	Public Code, No license specified	5. Decision & automation	Automated actuation
142	Contiki	ADS components - IoT & data	Universal	Developers	IOT integration	ALL	Contiki-os	7	Edge	https://github.com/contiki-os/contiki	Very high	3-clause BSD license	5. Decision & automation	Automated actuation
143	Seeder Roller Generator for Jang seeders	HW-based ADS	USA	Farmers	Sowing	ALL	Makeshop	5	Edge	https://github.com/Makeshop/SeederRollerGenerator	Low	Creative Commons Attribution 3.0 Unported (CC-by-S.A.)	5. Decision & automation	Automated actuation
144	Rover - Remote Electric Fence Switch by Text Message	HW-based ADS	USA	Farmers	Farm management	ALL	Farmhack user	6	Edge	https://farmhack.org/tools/rover-remote-electric-fence-switch-text-message	N/A	CC-BY-4.0	5. Decision & automation	Automated actuation
145	Customized Automated Resource Regulation and Optimization	HW-based ADS	Canada	Farmers	Irrigation	Crops	GitHub user	4 - 5	Edge	https://github.com/Artemis5010/C.A.R.R.O.T./tree/main	Low	CC-BY-4.0	5. Decision & automation	Automated actuation

	Technology													
146	Irrigation Controller	HW-based ADS	Universal	Farmers/Developers	Irrigation	Crops	GitHub user	6 - 7	Edge	https://github.com/mwick83/irrigation_ctrl_hw	N/A	BSD 3-clause	5. Decision & automation	Automated actuation
147	FluxePi	Complete ADS	Universal	Farmers/Advisors/Developers	Irrigation	Indoor farming	Fruxefarms	7	Cloud	https://github.com/fruxefarms/FruxePi	High	GPL 3.0 with amendments	5. Decision & automation	Automated actuation
148	ML-Based Fog-Cloud Agricultural Irrigation System	Complete ADS	Universal	Farmers/Developers	Irrigation	Crops	GitHub user	5 - 6	Mixed	https://github.com/duanepm/ML-Based-Fog-Cloud-Agricultural-Irrigation-System	Low	Public Code, No license specified	5. Decision & automation	Automated actuation
149	Harvestify	Complete ADS	Universal	Farmers/Advisors/Developers	Fertilization	Crops	GitHub user	7 - 8	Cloud	https://github.com/Gladiator07/Harvestify?tab=GPL-3.0-1-qv-file	Very high	GPL-3.0	5. Decision & automation	Decision dashboards
150	Crop Management System	Complete ADS	Universal	Farmers/Advisors	Fertilization	Crops	GitHub user	6 - 7	Edge	https://github.com/ab007shetty/crop-management-system	Low	MIT	5. Decision & automation	Decision dashboards
151	CropFusionAI	Complete ADS	Universal	Farmers/Advisors/Developers	Fertilization	Crops	GitHub user	6 - 7	Cloud	https://github.com/deepeshdm/CropFusionAI	Low	Public Code, No license specified	5. Decision & automation	Decision dashboards
152	AgriGo	Complete ADS	Universal	Farmers/Advisors/Developers	Fertilization/ Pest management	Crops	GitHub user	6 - 7	Cloud	https://github.com/kaymen99/AgriGo	Low	MIT license	5. Decision & automation	Decision dashboards
153	Eco-fertilization	Complete ADS	Universal	Farmers/Advisors/Developers	Fertilization	Crops	GitHub user	5 - 6	Edge	https://github.com/Gekko12/Eco-fertilization	Low	Public Code, No license specified	5. Decision & automation	Decision dashboards
154	Smart Agricultural Pest Management	Complete ADS	Universal	Farmers/Developers	Pest Management	Crops	GitHub user	6 - 7	Mixed	https://github.com/18hyacinthe/Smart-Agricultural-	Low	MIT license	5. Decision & automation	Decision dashboards

	System									Pests-Management-System?tab=readme-ov-file				
155	OpeanAgri pest and disease management	Complete ADS	Universal	Farmers/ Advisors/ Developers	Pest Management	Crops	OpenAgri		Mixed	https://github.com/openagri-eu/pest-and-disease-management	N/A	EUPL-1.2 license	5. Decision & automation	Decision dashboards
156	Smart AgroSensor for Irrigation Applications	Complete ADS	Universal	Farmers/ Advisors/ Developers	Irrigation	Crops	GitHub user	7	Mixed	https://github.com/HaroldMurcia/smartAgroS	Low	Public Code, No license specified	5. Decision & automation	Decision dashboards
157	OpenAgri irrigation management	Complete ADS	Universal	Farmers/ Advisors/ Developers	Irrigation	Crops	OpenAgri		Mixed	https://github.com/openagri-eu/irrigation-management	N/A	EUPL-1.2 license	5. Decision & automation	Decision dashboards
158	Agstack Ag-rec	Complete ADS	Universal	Farmers/ Advisors/ Developers	Farm management	Crops	Linux Foundation	5	Cloud	https://github.com/agstack/ag-rec	High	Apache-2.0 license	5. Decision & automation	Decision dashboards
159	FarmData2	ADS components - farm MGT	US-focused / adaptable	Diversified vegetable farmers / organic-certification staff	Farm records / harvest / organic certification	Vegetables	Dickinson College / FarmData2 community	4 - 5	Cloud / on-premise	https://github.com/FarmData2/FarmData2	Medium	GPL-3.0-or-later	5. Decision & automation	FMIS (Farm Management Software)
160	AgroNest	Complete ADS	Universal	Farmers/ Advisors/ Developers	Fertilization	Crops	GitHub user	5 - 6	Cloud	https://github.com/VeenathI/AgroNest	Low	Public Code	5. Decision & automation	FMIS (Farm Management Software)
161	Livestock Management System	Complete ADS	Universal	Farmers/ Developers	Livestock Management	Livestock	GitHub user	5 - 6	Cloud	https://github.com/vikram0230/Livestock-Management-System	Low	GPL-3.0 license	5. Decision & automation	FMIS (Farm Management Software)
162	KAMADHENU	Complete ADS	Universal	Farmers/ Researchers	Livestock Monitoring &	Livestock	GitHub user	5 - 6	Cloud	https://github.com/MautKaFarishta/KAMADHENU	Low	Public Code, No	5. Decision & automation	FMIS (Farm Manage

					Management							license specified		ment Software)
163	Demo eFarm	Complete ADS	Universal	Farmers/Developers	Poultry Farm Management	Poultry	GitHub user	5 - 6	Cloud	https://github.com/peter-evance/demo-efarm	Low	Public Code, No license specified	5. Decision & automation	FMIS (Farm Management Software)
164	Poultry Farming Management System	Complete ADS	Universal	Farmers/Developers	Poultry Farm Management	Poultry	GitHub user	5 - 6	Cloud	https://github.com/Musanza/Poultry-farming-management-system	Low	Public Code, No license specified	5. Decision & automation	FMIS (Farm Management Software)
165	farmOS	Complete ADS	Universal	Farmers/Advisors/Developers/Researchers	Farm management	Crops	farmOS	7	Cloud	https://github.com/farmOS/farmOS	Very high	GPL-2.0 license	5. Decision & automation	FMIS (Farm Management Software)
166	Crop Planning Software	Complete ADS	Universal	Farmers/Advisors/Developers	Farm management	Crops	GitHub user	4	Cloud	https://github.com/claytoncarte/cropplanning	High	GPL-3.0 license	5. Decision & automation	FMIS (Farm Management Software)
167	Litefarm	Complete ADS	Universal	Farmers/Advisors/Developers	Farm management	Crops	LiteFarmOrg	7	Cloud	https://github.com/LiteFarmOrg/LiteFarm	High	GPL-3.0 license	5. Decision & automation	FMIS (Farm Management Software)
168	Ekylibre	Complete ADS	Universal	Farmers/Advisors/Developers	Farm management	Crops	Ekylibre	7	Cloud	https://github.com/ekylibre/ekylibre	High	AGPL-3.0 license	5. Decision & automation	FMIS (Farm Management Software)
169	Tania	Complete ADS	Universal	Farmers/Advisors/Developers	Farm management	Crops	Tania	7	Cloud	https://github.com/usetania/tania-core	Very high	Apache-2.0 license	5. Decision & automation	FMIS (Farm Management Software)
170	OpeanAgri Farm Calendar	Complete ADS	Universal	Farmers/Advisors/Developers	Farm management	Crops/Livestock	OpenAgri		Mixed	https://github.com/openagri-eu/farmcalendar	N/A	EUPL-1.2 license	5. Decision & automation	FMIS (Farm Management Software)

				rs										ment Software)
171	QuantiFarm Benchmarking of farming practices tool	Complete ADS	Universal	Developers/ Advisors	Digital recording of farming practices and benchmarking on the use of inputs	Crops	QuantiFarm project	6	Mixed	https://gitlab.com/QuantiFarm/benchmarking-tool	Low	Public Code, No license specified	5. Decision & automation	FMIS (Farm Management Software)
172	Hyphascope	HW-based ADS	Japan	Farmers/ Developers/ Researchers	Pest management/ Fertilization	Crops	GitHub user	5 - 6	Edge	https://github.com/h-schaefer/hyphascope	Low	MIT	5. Decision & automation	FMIS (Farm Management Software)
173	l'Otomate	HW-based ADS	Canada	Farmers	Greenhouse management	Greenhouse	LoupHC	7	Edge	https://github.com/LoupHC/controleur-CAPE	Low	LGPL-3.0 license	5. Decision & automation	FMIS (Farm Management Software)
174	Fido, the temperature alarm that sends text messages	HW-based ADS	USA	Farmers	Greenhouse Temperature/data	Greenhouse	openpipe kit	4 - 5	Edge	https://github.com/openpipekit/fido	Low	Public Code, No license specified	5. Decision & automation	FMIS (Farm Management Software)
175	OpenRemote	3 - ADS components - IoT & data	Universal / EU-origin	IoT integrators / developers / operators	Device management / automation / visualisation	Crops / livestock	OpenRemote	8 - 9	Cloud / edge / mixed	https://github.com/openremote/openremote	High	AGPL-3.0	5. Decision & automation	Decision dashboards
176	Acorn Precision Farming Rover	4 - HW-based ADS	US-origin / adaptable	Farmers / robotics researchers / developers	Crop scouting / seeding / weeding / autonomous field operations	Crops	Twisted Fields	6 - 7	Edge / mixed	https://github.com/Twisted-Fields/acorn-precision-farming-rover	High	Apache-2.0	5. Decision & automation	Precision agriculture
177	FaST	Complete	Spain/It	Farmers/	Fertilization	Crops	DG	7 - 8	Cloud	https://gitlab.com	Low	MIT	5. Decision &	Precision

		ete ADS	aly/Esto nia	Advisors/ Develope rs	n		DEFIS/DG DIGIT/Eur opean Commissi on's DG Agricultur e and Rural Develop ment			m/fastplatform		license	automation	agricultur e
178	FarmMaps (Akkerweb). Open Source based/ Public code	Compl ete ADS	Netherla nds	Farmers/ Advisors/ Develope rs	Farm manage ment	Crops	AKKERWE B FOUNDATI ON	7	Cloud	https://git.akkerweb.nl/explore/repos	N/A	Various Licenses Open- Source based/O pen code	5. Decision & automation	Precision agricultur e
179	Farm Advisory Tool for Nutrients (SATIVUM) DSS/Agri- environmental Monitoring for wheat in Mediterranean region	Compl ete ADS	Spain	Farmers/ Advisors	Fertilizatio n	Wheat	QuantiFar m project	7	Mixed	https://www.sativum.es/web/sativum/tutorials	N/A	Public platform/ No source code available	5. Decision & automation	Precision agricultur e
180	AgIoT	Compl ete ADS	Portugal	Farmers/ Develope rs/ Research ers	Irrigation/ Fertilizatio n/ Pest manage ment	Mediterranean woody crops (apples, olives, Grapes)	Smart Farming project & Water4Ever project	6	Mixed	https://agiot.inesctec.pt/index.php/agiot-solution/	Low	Listed as Open Source, source code not found	5. Decision & automation	Precision agricultur e
181	Mycodo	HW- based ADS	Universa l	Growers / makers / researche rs / develope rs	Environme ntal monitorin g and regulation	Greenho uses / hydropo nics / crops	Kyle Gabriel / Mycodo communit y	7 - 8	Edge / mixed	https://github.com/kizniche/Mycodo	Very high	GPL-3.0- or-later	5. Decision & automation	FMIS (Farm Manage ment Software)
182	Agromatic	Compl ete ADS	Universa l	Develope rs/ Research	Fertilizatio n	Crops	GitHub user	5 - 6	Edge	https://github.com/nicolapace/agromatic	Low	Public Code, No	5. Decision & automation	Smart Robotics

				ers							license specified			
183	FarmBot OS Web app	Complete ADS	Universal	Farmers/Developers	Small Farms/Gardens management	Crops	FarmBot	7	Cloud	https://github.com/FarmBot/Farmbot-Web-App	Very high	MIT license	5. Decision & automation	Smart Robotics
184	DJI Payload SDK	ADS components - IoT & data	Universal	Developers	IOT integration	ALL	dji-sdk	9	Edge	https://github.com/dji-sdk/Payload-SDK	Very high	MIT License	5. Decision & automation	Smart Robotics
185	Dro-Matic	ADS components - farm MGT	Universal	Farmers/Advisors/Developers	Fertilization/Irrigation/Pest management	Crops	GitHub user	5	Edge	https://github.com/drolsen/DRO-Matic	Very high	Public Code, No license specified	5. Decision & automation	Automated actuation
186	Farmtopia digital field book	ADS components - farm MGT	Universal	Developers	Digital recording of farming practices	ALL	Farmtopia a project	6	Cloud	https://gitlab.com/Farmtopia/digital-field-book	Low	Public Code, No license specified	5. Decision & automation	FMIS (Farm Management Software)
187	OpenAgri Gatekeeper	ADS components - farm MGT	Universal	Developers	Farm management	ALL	OpenAgri		Mixed	https://github.com/openagri-eu/GateKeeper	N/A	EUPL-1.2 license	5. Decision & automation	FMIS (Farm Management Software)
188	GDAY model	ADS components - farm MGT	Universal	Developers/Researchers	Fertilization	Crops	GitHub user	3	Cloud	https://github.com/mdekauwe/GDAY	Low	Public Code, No license specified	5. Decision & automation	Precision agriculture
189	Fields2Cover	ADS components - farm MGT	Universal	Developers/Farmers	Automation in Agriculture	Crops	Fields2Cover	7	Edge	https://github.com/Fields2Cover/Fields2Cover	Very high	BSD 3-Clause License	5. Decision & automation	Precision agriculture
190	AgOpenGPS	ADS components -	Universal	Developers	Farm management/	ALL	AgOpenGPS-Official	7	Cloud	https://github.com/AgOpenGPS-Official/AgOpen	Very high	GNU GENERAL PUBLIC	5. Decision & automation	Precision agriculture

		farm MGT			Map service					GPS		LICENSE		
191	Evapotranspiration	ADS components - farm MGT	Universal	Developers	Climate data service	Crops	GitHub user	5	Cloud	https://github.com/brycejohnston/evapotranspiration	Low	BSD 3-Clause License	5. Decision & automation	Precision agriculture
192	OADA Reference API Server	ADS components - IoT & data	Universal / US-origin	Agricultural platform developers / data holders	Agricultural data exchange / permissions	Crops / livestock	Open Ag Data Alliance	5 - 6	Cloud / on-premise	https://github.com/OADA/server	Medium	See repository licence	6. Ecosystem & consumer	Traceability platforms
193	OpenEPCIS DPP-Ready	Complete ADS	EU / Universal	Traceability providers / developers / regulators / supply-chain operators	Traceability / compliance / product passports	Agrifood products / supply chains	OpenEPCIS community	5 - 6	Cloud / on-premise	https://github.com/openepcis/openepcis-dpp-ready	High	Apache-2.0	6. Ecosystem & consumer	Traceability platforms
194	Hyperledger Fabric	ADS components - IoT & data	Universal	Developers / consortium operators / auditors	Data integrity / audit / traceability	Crops / livestock / supply chains	Hyperledger Foundation	9	Cloud / mixed	https://github.com/hyperledger/fabric	Very high	Apache-2.0	6. Ecosystem & consumer	Traceability platforms
195	Sen4Cap	Complete ADS	Czech Republic/Italy/Lithuania/Netherlands/Romania/Spanish region Castilla y Leon	Farmers/Advisors/Developers	Farm management/ Agricultural practices monitoring	Crops	DG-Agri/DG-Grow/DG-JRC	7	Cloud	https://github.com/Sen4CAP/Sen4CAP	High	https://github.com/Sen4CAP/Sen4CAP/tree/master/licenses	6. Ecosystem & consumer	Regulatory compliance
196	OpenAgri reporting	Complete	Universal	Farmers/Advisors/	Farm management	Crops/Livestock	OpenAgri		Mixed	https://github.com/openagri-	N/A	EUPL-1.2 license	6. Ecosystem & consumer	Regulatory

	service	ADS		Developers	ment					eu/reporting-service				compliance
197	Fertilizer-Management-System	Complete ADS	Universal	Farmers/Advisors	Fertilization	Crops	GitHub user	4 - 5	Edge	https://github.com/W-P-N/Fertilizer-Management-System	Low	Public Code, No license specified	6. Ecosystem & consumer	Retail & Logistics
198	Fertilizer Distribution Management System	Complete ADS	Universal	Advisors (Municipalities, Agricultural Officers)	Fertilization	Crops	GitHub user	5	Edge	https://github.com/chamathamasinghe96/Fertilizer-Distribution-Management-System	Low	Public Code, No license specified	6. Ecosystem & consumer	Retail & Logistics
199	Open Food Network	Complete ADS	Universal	Farmers/Advisors/Developers	Distribution	ALL	Open Food Foundation	7	Cloud	https://github.com/openfoodfoundation/openfoodnetwork	Very high	AGPL-3.0 license	6. Ecosystem & consumer	Retail & Logistics

Annex 2. Standards catalogue

Name	SDO/Project	Link	EU	Stack layer	Component
ETSI TS 103 410-1 V1.2.1 SmartM2M; Extension to SAREF; Part 1: Energy Domain	ETSI	https://www.etsi.org/deliver/etsi_ts/103400_103499/10341001/01_02.01_60/ts_10341001v010201p.pdf	Yes	1. Hardware Infrastructure & Platforms	Semiconductors: MCUs, SoCs, FPGAs, AI accelerators
Test Mobile Platform to Maintain a Separation Distance MOB-MSD-2	COVER project	https://covfilestorage.blob.core.windows.net/documents/protocols/MOB-MSD-2%20Test%20Mobile%20Platform%20to%20Maintain%20a%20Separation%20Distance.pdf	Yes	1. Hardware Infrastructure & Platforms	Robotics platforms: Drone airframes, autonomous vehicles
Test Limit Restraining Energy for Upper Limb Exoskeleton Type RACA Robots (EXO-LRE-2)	COVER project	https://covfilestorage.blob.core.windows.net/documents/protocols/EXO-LRE-2%20Test%20Limit%20Restraining%20Energy%20for%20Upper%20Extremity%20Exoskeleton.pdf	Yes	1. Hardware Infrastructure & Platforms	Robotics platforms: Drone airframes, autonomous vehicles
ETSI TR 103 545 V1.1.1 (2018-08) SmartM2M; Pilot test definition and guidelines for testing cooperation between oneM2M and Ag equipment standards	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=52896	Yes	1. Hardware Infrastructure & Platforms	Agro-vehicles
IEEE P21451-1-6™ Standard for a Smart Transducer Interface for Sensors, Actuators, and Devices – Message Queue Telemetry Transport (MQTT) for Networked Device Communication	IEEE	https://ieeexplore.ieee.org/document/11373432	No	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
ITU-T Y Suppl. 76 Use cases of Internet of things-based smart agriculture	ITU	https://www.intertekinform.com/en-gb/standards/itu-t-y-suppl-76-09-2023-1344020_saig_itu_itu_3342182/	No	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT
ITU-T Y.Supp.SmartAqua-usecases LTU-T Y.4000-series - Use cases of IoT-based smart aquaculture	ITU	https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18753	No	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT
ISO 5231:2022 Extended farm management information systems data interface (EFDI) — Concept and guidelines	ISO	https://www.intertekinform.com/en-gb/standards/itu-t-y-suppl-76-09-2023-1344020_saig_itu_itu_3342182/	No	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT
ITU-T Y.SCGMS Requirements and capabilities of IoT-based smart crop growth monitoring system	ITU	https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19602	No	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT
ITU-T Y.ACC-IoTMV Accessibility	ITU	https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19602	No	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT

requirements for metaverse services supporting IoT		t/workprog/wp_item.aspx?isn=19599			
ETSI TR 103 545 SmartM2M; Pilot test definition and guidelines for testing cooperation between oneM2M and Ag equipment standards	ETSI	https://www.etsi.org/deliver/etsi_tr/103500_103599/103545/01.01.01_60/tr_103545v010101p.pdf	Yes	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT
ISO – ISO 11783 (ISOBUS) for farm machinery communication	ISO	https://www.iso.org/standard/57556.html	No	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
OGC API - Connected Systems Standard	OGC	https://www.ogc.org/standards/ogc-api-connected-systems/	No	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
ETSI TR 103 535 V1.1.1 (2019-10) SmartM2M; Guidelines for using semantic interoperability in the industry	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=52936	Yes	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT
ETSI TR 103 781 V1.1.1 (2023-09) SmartM2M; Study for SAREF ontology patterns and usage guidelines	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=61440	Yes	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT
ETSI TS 129 198-4-2 V6.4.1 (2006-07) Universal Mobile Telecommunications System (UMTS); Open Service Access (OSA) Application Programming Interface (API); Part 4: Call control; Subpart 2: Generic call control Service Capability Feature (SCF) (3GPP TS 29.198-04-2 version 6.4.1 Release 6)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=24985	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
ETSI ES 203 915-4-2 V1.2.1 (2007-01) Open Service Access (OSA); Application Programming Interface (API); Part 4: Call Control; Sub-part 2: Generic Call Control SCF (Parlay 5)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=22410	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
ETSI TS 129 198-4-4 V6.5.1 (2006-07) Universal Mobile Telecommunications System (UMTS); Open Service Access (OSA) Application Programming Interface (API); Part 4: Call control; Subpart 4: Multimedia call control Service Capability Feature (SCF) (3GPP TS 29.198-04-4 version 6.5.1 Release 6)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=24987	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity

ETSI ES 202 388-9 V1.1.1 (2005-03) Open Service Access (OSA); Application Programming Interface (API); Test Suite Structure and Test Purposes (TSS&TP); Part 9: Generic messaging SCF (Parlay 4)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=19594	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
ETSI TR 103 547 V1.1.1 (2019-10) SmartM2M; SAREF extension investigation; Requirements for the Water domain	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=53014	Yes	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT
ETSI TS 129 198-4-2 V9.0.0 (2010-01) Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Open Service Access (OSA) Application Programming Interface (API); Part 4: Call control; Subpart 2: Generic call control Service Capability Feature (SCF) (3GPP TS 29.198-04-2 version 9.0.0 Release 9)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=32627	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
ETSI TS 129 198-4-2 V8.0.0 (2009-01) Universal Mobile Telecommunications System (UMTS); LTE; Open Service Access (OSA) Application Programming Interface (API); Part 4: Call control; Subpart 2: Generic call control Service Capability Feature (SCF) (3GPP TS 29.198-04-2 version 8.0.0 Release 8)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=29910	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
ETSI TS 129 198-4-2 V7.0.0 (2007-03) Universal Mobile Telecommunications System (UMTS); Open Service Access (OSA) Application Programming Interface (API); Part 4: Call control; Subpart 2: Generic call control Service Capability Feature (SCF) (3GPP TS 29.198-04-2 version 7.0.0 Release 7)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=26111	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
ETSI TS 129 198-4-2 V5.9.1 (2004-12) Universal Mobile Telecommunications System (UMTS); Open Service Access (OSA) Application Programming Interface (API); Part 4: Call control; Subpart 2: Generic call control Service Capability Feature (SCF) (3GPP TS 29.198-04-2 version 5.9.1 Release 5)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=22256	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
ETSI ES 204 915-4-2 V1.1.1 (2008-05) Open	ETSI	https://webapp.etsi.org/workprogram/Report	Yes	3. Connectivity & Edge	Network management:

Service Access (OSA); Application Programming Interface (API); Part 4: Call Control; Sub-part 2: Generic Call Control SCF (Parlay 6)		WorkItem.asp?WKI_ID=23407			spectrum sharing, slicing, mesh networking, multi-connectivity
ETSI ES 202 915-4-2 V1.4.1 (2006-12) Open Service Access (OSA); Application Programming Interface (API); Part 4: Call Control; Sub-part 2: Generic Call Control SCF (Parlay 4)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=22389	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
ETSI TS 129 198 V3.4.0 (2001-08) Universal Mobile Telecommunications System (UMTS); Open Service Architecture (OSA) Application Programming Interface (API) - Part 1 (3GPP TS 29.198 version 3.4.0 Release 1999)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=14458	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
ETSI TS 129 198-4-4 V9.0.0 (2010-01) Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Open Service Access (OSA) Application Programming Interface (API); Part 4: Call control; Subpart 4: Multimedia call control Service Capability Feature (SCF) (3GPP TS 29.198-04-4 version 9.0.0 Release 9)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=32629	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
ETSI TS 129 198-4-4 V8.0.0 (2009-01) Universal Mobile Telecommunications System (UMTS); LTE; Open Service Access (OSA) Application Programming Interface (API); Part 4: Call control; Subpart 4: Multimedia call control Service Capability Feature (SCF) (3GPP TS 29.198-04-4 version 8.0.0 Release 8)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=29719	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
ETSI TS 129 198-4-4 V7.0.0 (2007-03) Universal Mobile Telecommunications System (UMTS); Open Service Access (OSA) Application Programming Interface (API); Part 4: Call control; Subpart 4: Multimedia call control Service Capability Feature (SCF) (3GPP TS 29.198-04-4 version 7.0.0 Release 7)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=26112	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
ETSI TS 129 198-4-4 V5.9.1 (2004-12) Universal Mobile Telecommunications	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=22258	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing,

System (UMTS); Open Service Access (OSA) Application Programming Interface (API); Part 4: Call control; Subpart 4: Multimedia call control Service Capability Feature (SCF) (3GPP TS 29.198-04-4 version 5.9.1 Release 5)					mesh networking, multi-connectivity
ETSI ES 204 915-4-4 V1.1.1 (2008-05) Open Service Access (OSA); Application Programming Interface (API); Part 4: Call Control; Sub-part 4: Multi-Media Call Control SCF (Parlay 6)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=23409	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
ETSI ES 203 915-4-4 V1.2.1 (2007-01) Open Service Access (OSA); Application Programming Interface (API); Part 4: Call Control; Sub-part 4: Multi-Media Call Control SCF (Parlay 5)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=22412	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
ETSI ES 202 915-4-4 V1.4.1 (2006-12) Open Service Access (OSA); Application Programming Interface (API); Part 4: Call Control; Sub-part 4: Multi-Media Call Control SCF (Parlay 4)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=22391	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
ETSI SR 002 180 V1.1.1 (2003-12) Emergency communications; Requirements for communication of citizens with authorities/organizations in case of distress (emergency call handling)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=18335	Yes	3. Connectivity & Edge	Cellular: 4G, 5G private networks, satellite-cellular convergence (NTN)
ETSI TS 129 198-4 V4.11.0 (2004-12) Universal Mobile Telecommunications System (UMTS); Open Service Access (OSA) Application Programming Interface (API); Part 4: Call control - Service Capability Feature (SCF) (3GPP TS 29.198-04 version 4.11.0 Release 4)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=21884	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
ETSI TR 102 180 V1.5.1 (2015-07) Emergency Communications (EMTEL); Basis of requirements for communication of individuals with authorities/organizations in case of distress (Emergency call handling)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=41969	Yes	3. Connectivity & Edge	Cellular: 4G, 5G private networks, satellite-cellular convergence (NTN)
ETSI ES 201 915-4 V1.6.1 (2006-12) Open Service Access (OSA); Application Programming Interface (API); Part 4: Call Control SCF (Parlay 3)	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=22292	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity

ETSI TR 103 761 V1.1.1 (2022-05) Core Network and Interoperability Testing (INT); Methodologies for E2E Testing & Validation of Vertical Applications over 5G & Beyond networks	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=59575	Yes	3. Connectivity & Edge	Cellular: 4G, 5G private networks, satellite-cellular convergence (NTN)
ETSI ETS 300 133-3 ed.2 (1997-11) ElectroMagnetic Compatibility and Radio Spectrum Matters (ERM); Enhanced Radio MESSage System (ERMES); Part 3: Network aspects	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=2961	Yes	3. Connectivity & Edge	Network management: spectrum sharing, slicing, mesh networking, multi-connectivity
ETSI TS 103 410-6 V2.1.1 (2024-10) SmartM2M; Extension to SAREF; Part 6: Smart Agriculture and Food Chain Domain	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=63062	Yes	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT
ETSI TS 103 410-6 V1.1.2 (2020-05) SmartM2M; Extension to SAREF; Part 6: Smart Agriculture and Food Chain Domain	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=59268	Yes	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT
EN 17927:2023: Security Evaluation Standard for IoT Platforms (SESIP)	CEN/CLC/JTC 13	https://standards.cencenelec.eu/ords/f?p=CEN:110:::FSP_PROJECT,FSP_ORG_ID:74909,2307986&cs=1F38C69B1C93084C4191897B41BC64DF6	Yes	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT
CWA 17431:2019: Principles and guidance for licensing Standard Essential Patents in 5G and the Internet of Things (IoT), including the Industrial Internet	CEN/CLC/WS SEP-IoT	https://standards.cencenelec.eu/ords/f?p=CEN:110:::FSP_PROJECT,FSP_ORG_ID:69716,2366187&cs=115EC70F709034A0B6EE8BB2DF799F987	Yes	3. Connectivity & Edge	LPWAN: LoRaWAN, NB-IoT
IEEE P2992™ Recommended Practice for Data Expression, Exchange, and Processing in Smart Agriculture	IEEE	https://standards.ieee.org/ieee/2992/10614/	No	4. Data & intelligence	Data platforms: Data spaces, FIWARE
ITU-T Y.SPDM-reqts Requirements and a reference model of data for Smart Pest and Disease Management (SPDM) service	ITU	https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19636	No	4. Data & intelligence	Data platforms: Data spaces, FIWARE
IEEE P2992 Recommended Practice for Data Expression, Exchange, and Processing in Smart Agriculture	IEEE	https://standards.ieee.org/ieee/2992/10614/	No	4. Data & intelligence	Data platforms: Data spaces, FIWARE
FIWARE in Agrifood	FIWARE	https://www.fiware.org/community/smart-agrifood/	Yes	4. Data & intelligence	Data platforms: Data spaces, FIWARE
ADAPT Standard	AgGateway	https://aggateway.org/GetConnected/ADAPTStandard.aspx	No	4. Data & intelligence	Big data & storage: Time-series DBs, geospatial data management, data lakes,

					data lakehouses
GeoAPI Implementation Specification	OGC	https://www.ogc.org/standards/geoapi/	No	4. Data & intelligence	Big data & storage: Time-series DBs, geospatial data management, data lakes, data lakehouses
OGC Environmental Data Retrieval APIs	OGC	https://www.ogc.org/standards/ogcapi-edr/	No	4. Data & intelligence	Big data & storage: Time-series DBs, geospatial data management, data lakes, data lakehouses
OGC API – Maps Standard	OGC	https://www.ogc.org/standards/ogcapi-maps/	No	4. Data & intelligence	Big data & storage: Time-series DBs, geospatial data management, data lakes, data lakehouses
OGC API - Moving Features Standard	OGC	https://www.ogc.org/standards/ogc-api-moving-features/	No	4. Data & intelligence	Big data & storage: Time-series DBs, geospatial data management, data lakes, data lakehouses
OGC API - Processes Standard	OGC	https://www.ogc.org/standards/ogcapi-processes/	No	4. Data & intelligence	Data platforms: Data spaces, FIWARE
OGC API - Records Standard	OGC	https://www.ogc.org/standards/ogcapi-records/	No	4. Data & intelligence	Big data & storage: Time-series DBs, geospatial data management, data lakes, data lakehouses
OGC SensorThings API Standard	OGC	https://www.ogc.org/standards/sensorthings/	No	4. Data & intelligence	Big data & storage: Time-series DBs, geospatial data management, data lakes, data lakehouses
OpenEO Community Standard	OGC	https://www.ogc.org/standards/openeo/	No	4. Data & intelligence	Big data & storage: Time-series DBs, geospatial data management, data lakes, data lakehouses
OGC DGGS Standard	OGC	https://www.ogc.org/standards/dggs/	No	4. Data & intelligence	Big data & storage: Time-series DBs, geospatial data management, data lakes, data lakehouses
OGC 3D Portrayal Standard	OGC	https://www.ogc.org/standards/3dp/	No	4. Data & intelligence	Big data & storage: Time-series DBs, geospatial data management, data lakes, data lakehouses
OGC OLS Standard	OGC	https://www.ogc.org/standards/ols/	No	4. Data & intelligence	Big data & storage: Time-

					series DBs, geospatial data management, data lakes, data lakehouses
OGC Table Joining Service (TJS) Standard	OGC	https://www.ogc.org/standards/tjs/	No	4. Data & intelligence	Big data & storage: Time-series DBs, geospatial data management, data lakes, data lakehouses
OGC Web Coverage Service (WCS) Standard	OGC	https://www.ogc.org/standards/wcs/	No	4. Data & intelligence	Big data & storage: Time-series DBs, geospatial data management, data lakes, data lakehouses
ETSI TR 103 511 V1.1.1 (2018-10) SmartM2M; SAREF extension investigation; Requirements for AgriFood domain	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=51408	Yes	4. Data & intelligence	AI / Machine Learning: Computer Vision (Crop/Pest detection), Time Series processing (yield prediction), Agentic AI (assistants), Data Fusion (Satellite+IoT+Drone image...)
ETSI GR CIM 048 V1.1.1 (2024-09) Context Information Management (CIM); Handling of data catalogues and data services with NGSI-LD	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=69097	Yes	4. Data & intelligence	Data platforms: Data spaces, FIWARE
prEN 18284: Artificial Intelligence -- Quality and governance of datasets in AI	CEN/CLC/JTC 21	https://standards.cencenelec.eu/ords/f?p=CEN:110:::FSP_PROJECT,FSP_ORG_ID:80364,2916257&cs=1F3F7FCF8728AEBD258E2790D50E6F92D	Yes	4. Data & intelligence	AI / Machine Learning: Computer Vision (Crop/Pest detection), Time Series processing (yield prediction), Agentic AI (assistants), Data Fusion (Satellite+IoT+Drone image...)
prEN 18283: Artificial Intelligence - Concepts, measures and requirements for managing bias in AI systems	CEN/CLC/JTC 21	https://standards.cencenelec.eu/ords/f?p=CEN:110:::FSP_PROJECT,FSP_ORG_ID:80353,2916257&cs=14C92716EF2EB6328296AA6B7B221F274	Yes	4. Data & intelligence	AI / Machine Learning: Computer Vision (Crop/Pest detection), Time Series processing (yield prediction), Agentic AI (assistants), Data Fusion (Satellite+IoT+Drone image...)
prCEN/CLC/TR XXX: Guidance on application of Risk Management in Critical Digital Infrastructure	CEN/CLC/JTC 21	https://standards.cencenelec.eu/ords/f?p=CEN:110:::FSP_PROJECT,FSP_ORG_ID:82880,2916257&cs=1C7FBF62912BC5FC503D46A5340904	Yes	4. Data & intelligence	AI / Machine Learning: Computer Vision (Crop/Pest detection), Time

		AE9			Series processing (yield prediction), Agentic AI (assistants), Data Fusion (Satellite+IoT+Drone image...)
prCEN/CLC/TR 18347: Overview and architecture of standards in support of the EU AI Ac	CEN/CLC/JTC 21	https://standards.cencenelec.eu/ords/f?p=CEN:110::::FSP_PROJECT,FSP_ORG_ID:82879,2916257&cs=18C1783B9185FEB352EBD1296A8D72787	Yes	4. Data & intelligence	AI / Machine Learning: Computer Vision (Crop/Pest detection), Time Series processing (yield prediction), Agentic AI (assistants), Data Fusion (Satellite+IoT+Drone image...)
prCEN/CLC ISO/IEC/TS 22440-1: Artificial Intelligence – Functional Safety and AI systems – Part 1: Requirements	CEN/CLC/JTC 21	https://standards.cencenelec.eu/ords/f?p=CEN:110::::FSP_PROJECT,FSP_ORG_ID:82782,2916257&cs=18A5FF1EB5B2BEF1E883BEA1C0038D9A5	Yes	4. Data & intelligence	AI / Machine Learning: Computer Vision (Crop/Pest detection), Time Series processing (yield prediction), Agentic AI (assistants), Data Fusion (Satellite+IoT+Drone image...)
prCEN/CLC ISO/IEC/TS 22440-2: Artificial intelligence — Functional safety and AI systems — Part 2: Guidance	CEN/CLC/JTC 21	https://standards.cencenelec.eu/ords/f?p=CEN:110::::FSP_PROJECT,FSP_ORG_ID:82778,2916257&cs=129C7A437D42C75E1D145FE4819ABA46C	Yes	4. Data & intelligence	AI / Machine Learning: Computer Vision (Crop/Pest detection), Time Series processing (yield prediction), Agentic AI (assistants), Data Fusion (Satellite+IoT+Drone image...)
prCEN/CLC ISO/IEC/TS 22440-3: Artificial intelligence — Functional safety and AI systems — Part 3: Examples of application	CEN/CLC/JTC 21	https://standards.cencenelec.eu/ords/f?p=CEN:110::::FSP_PROJECT,FSP_ORG_ID:82776,2916257&cs=14307D2EACB5612DE6A840C0E2A14B5CD	Yes	4. Data & intelligence	AI / Machine Learning: Computer Vision (Crop/Pest detection), Time Series processing (yield prediction), Agentic AI (assistants), Data Fusion (Satellite+IoT+Drone image...)
EN ISO/IEC 23053:2023: Framework for Artificial Intelligence (AI) Systems Using Machine Learning (ML) (ISO/IEC 23053:2022, Corrected version 2025-12)	CEN/CLC/JTC 21	https://standards.cencenelec.eu/ords/f?p=CEN:110::::FSP_PROJECT,FSP_ORG_ID:76617,2916257&cs=107C5686ED337439B36FCDFB43026D6C1	Yes	4. Data & intelligence	AI / Machine Learning: Computer Vision (Crop/Pest detection), Time Series processing (yield prediction), Agentic AI (assistants), Data Fusion

					(Satellite+IoT+Drone image...)
CEN/CLC/TR 18115:2024: Data governance and quality for AI within the European context	CEN/CLC/JTC 21	https://standards.cencenelec.eu/ords/f?p=CEN:110:::::FSP_PROJECT,FSP_ORG_ID:76985,2916257&cs=13661478DFC73446C13B8A219DE061701	Yes	4. Data & intelligence	AI / Machine Learning: Computer Vision (Crop/Pest detection), Time Series processing (yield prediction), Agentic AI (assistants), Data Fusion (Satellite+IoT+Drone image...)
CEN/CLC/TR 17894:2024: Artificial Intelligence - Artificial Intelligence Conformity Assessment	CEN/CLC/JTC 21	https://standards.cencenelec.eu/ords/f?p=CEN:110:::::FSP_PROJECT,FSP_ORG_ID:75934,2916257&cs=1BCF0B86E7FBFA330922FE3FD0D8E523B	Yes	4. Data & intelligence	AI / Machine Learning: Computer Vision (Crop/Pest detection), Time Series processing (yield prediction), Agentic AI (assistants), Data Fusion (Satellite+IoT+Drone image...)
JT025018: Data quality in data spaces	CEN/CLC/JTC 25	https://standards.cencenelec.eu/ords/f?p=CEN:110:::::FSP_PROJECT,FSP_ORG_ID:83613,3485479&cs=14F9AF46AC62D1D818C25D52AC1A4E836	Yes	4. Data & intelligence	Data platforms: Data spaces, FIWARE
CEN/CLC ISO/IEC/TR 24027:2023: Information technology - Artificial intelligence (AI) - Bias in AI systems and AI aided decision making (ISO/IEC TR 24027:2021)	CEN/CLC/JTC 21	https://standards.cencenelec.eu/ords/f?p=CEN:110:::::FSP_PROJECT,FSP_ORG_ID:77588,2916257&cs=11751E582924E90E917ED96D948072B4CD	Yes	4. Data & intelligence	AI / Machine Learning: Computer Vision (Crop/Pest detection), Time Series processing (yield prediction), Agentic AI (assistants), Data Fusion (Satellite+IoT+Drone image...)
Tractors and machinery for agriculture and forestry - Safety-related parts of control systems - Part 1: General principles for design and development (ISO 25119-1:2018)	CEN/TC 144	https://standards.cencenelec.eu/ords/f?p=CEN:110:::::FSP_PROJECT,FSP_ORG_ID:74376,6126&cs=16DD3293D9C6942060F068B965A35F708	Yes	5. Decision & automation	Smart Robotics: autonomous harvesters, weeding robots, robotic milking
Tractors and machinery for agriculture and forestry - Safety-related parts of control systems - Part 2: Concept phase (ISO 25119-2:2019)	CEN/TC 144	https://standards.cencenelec.eu/ords/f?p=CEN:110:::::FSP_PROJECT,FSP_ORG_ID:74379,6126&cs=1603D8C52FD85DE3AFC07DE6BA664769E	Yes	5. Decision & automation	Smart Robotics: autonomous harvesters, weeding robots, robotic milking
Tractors and machinery for agriculture and forestry - Safety-related parts of control systems - Part 3: Series development,	CEN/TC 144	https://standards.cencenelec.eu/ords/f?p=CEN:110:::::FSP_PROJECT,FSP_ORG_ID:74378,6126&cs=13920C46C734D5BFF55379E8527E5F0FD	Yes	5. Decision & automation	Smart Robotics: autonomous harvesters, weeding robots, robotic

hardware and software (ISO 25119-3:2018)					milking
Tractors and machinery for agriculture and forestry - Safety-related parts of control systems - Part 4: Production, operation, modification and supporting processes (ISO 25119-4:2018)	CEN/TC 144	https://standards.cencenelec.eu/ords/f?p=CEN:110:::FSP_PROJECT,FSP_ORG_ID:74377,6126&cs=1F6C4D3CE4866E38809FF462238DA8825	Yes	5. Decision & automation	Smart Robotics: autonomous harvesters, weeding robots, robotic milking
IEEE P2418.3™ Standard for the Framework of Distributed Ledger Technology (DLT) Use in Agriculture	IEEE	https://standards.ieee.org/initiatives/agriculture-standards-projects/	No	6. Market, Consumer & Regulatory	Traceability platforms: blockchain-based supply chain, EU Digital Product Passport
ETSI GR IPE 006 V1.1.1 (2022-11) IPv6 Enhanced innovation (IPE); IPv6 and Cloud using DataBlockMatrix for Food Supply Chain Tracking and Tracing	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=62559	Yes	6. Market, Consumer & Regulatory	Traceability platforms: blockchain-based supply chain, EU Digital Product Passport
ETSI GR PDL 008 V1.1.1 (2021-09) Permissioned Distributed Ledger (PDL); Research and Innovation Landscape	ETSI	https://webapp.etsi.org/workprogram/Report_WorkItem.asp?WKI_ID=61560	Yes	6. Market, Consumer & Regulatory	Traceability platforms: blockchain-based supply chain, EU Digital Product Passport
EN ISO/IEC 19896-1:2025: Information security, cybersecurity and privacy protection - Part 1	CEN/CLC/JTC 13	https://standards.cencenelec.eu/ords/f?p=CEN:110:::FSP_PROJECT,FSP_ORG_ID:79981,2307986&cs=1A6FD71A4FA40CD08ABB0D8CB24037230	Yes	6. Market, Consumer & Regulatory	Regulatory compliance: CAP reporting tools, sustainability certification systems, AI Act, CRA
EN ISO/IEC 19896-2:2026: Information security, cybersecurity and privacy protection - Part 2	CEN/CLC/JTC 13	https://standards.cencenelec.eu/ords/f?p=CEN:110:::FSP_PROJECT,FSP_ORG_ID:80604,2307986&cs=17822A362BD51AC4E65239C80AD654F0A	Yes	6. Market, Consumer & Regulatory	Regulatory compliance: CAP reporting tools, sustainability certification systems, AI Act, CRA
EN ISO/IEC 19896-3:2025: Information security, cybersecurity and privacy protection - Part 3	CEN/CLC/JTC 13	https://standards.cencenelec.eu/ords/f?p=CEN:110:::FSP_PROJECT,FSP_ORG_ID:79982,2307986&cs=12AC94DE7ADF5CEA50C3CF2D7EE1901A8	Yes	6. Market, Consumer & Regulatory	Regulatory compliance: CAP reporting tools, sustainability certification systems, AI Act, CRA
EN 17799:2023: Personal data protection requirements for processing operations	CEN/CLC/JTC 13	https://standards.cencenelec.eu/ords/f?p=CEN:110:::FSP_PROJECT,FSP_ORG_ID:72146,2307986&cs=1B1D330F270952A092F6774058C1C7D2D	Yes	6. Market, Consumer & Regulatory	Regulatory compliance: CAP reporting tools, sustainability certification systems, AI Act, CRA
EN 17640:2022: Fixed-time cybersecurity evaluation methodology for ICT products	CEN/CLC/JTC 13	https://standards.cencenelec.eu/ords/f?p=CEN:110:::FSP_PROJECT,FSP_ORG_ID:70971,2307986&cs=127AD6F8FF9229285FC765697D1980719	Yes	6. Market, Consumer & Regulatory	Regulatory compliance: CAP reporting tools, sustainability certification systems, AI Act, CRA
EN 17529:2022: Data protection and privacy by design and by default	CEN/CLC/JTC 13	https://standards.cencenelec.eu/ords/f?p=CEN:110:::FSP_PROJECT,FSP_ORG_ID:63633,230	Yes	6. Market, Consumer & Regulatory	Regulatory compliance: CAP reporting tools,

		7986&cs=1359C340E712AD07ABD2189B746AADF3D			sustainability certification systems, AI Act, CRA
EN 16234-1:2019: e-Competence Framework (e-CF) - A common European Framework for ICT Professionals in all sectors - Part 1: Framework	CEN/TC 428	https://standards.cencenelec.eu/ords/f?p=CEN:110:::::FSP_PROJECT,FSP_ORG_ID:71000,2581441&cs=1E189F66CCD4AE68B61B0BA748869F672	Yes	6. Market, Consumer & Regulatory	Regulatory compliance: CAP reporting tools, sustainability certification systems, AI Act, CRA
CWA 17525:2020: Elements of fair and functioning data economy: identity, consent and logging	CEN/WS IHAN	https://standards.cencenelec.eu/ords/f?p=CEN:110:::::FSP_PROJECT,FSP_ORG_ID:71000,2581441&cs=1E189F66CCD4AE68B61B0BA748869F672	Yes	6. Market, Consumer & Regulatory	Regulatory compliance: CAP reporting tools, sustainability certification systems, AI Act, CRA

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About [AIOTI](#)

AIOTI is the multi-stakeholder platform for stimulating AI, IoT and Edge Continuum Innovation in Europe, bringing together small and large companies, academia, researchers, policy makers, end-users and representatives of society in an end-to-end approach. We strive to leverage, share and promote best practices in the AI, IoT and Edge Continuum ecosystems, be a one-stop point of information to our members while proactively addressing key issues and roadblocks for economic growth, acceptance and adoption of the AI, IoT and Edge Continuum Innovation in society. AIOTI contributions goes beyond technology and addresses horizontal elements across application domains, such as matchmaking and stimulating cooperation by creating joint research roadmaps, defining policies and driving convergence of standards and interoperability.

About [AIOTI WG Agriculture](#)

The Working Group aims to unlock the full potential of AI, IoT and Edge Continuum technologies, solutions, services, ecosystem, and infrastructure to support future-proof, sustainable agri-food and forestry value chains in Europe. Become the reference ICT community for influencing the digital agenda for EU agriculture. Leadership: Chair: Luis Perez Freire (Gradient), Co-Chair: Christopher Brewster (TNO)

About [OpenAgri](#)

OpenAgri is a Horizon Europe project focusing on democratising digital farming through tailored open source and open hardware solutions. In this context, OpenAgri delivers open-source, reusable and standards-compliant software services that accelerate the creation of Agricultural Digital Solutions. These ready-to-integrate components help developers build faster, reduce costs, and ensure reliable interoperability across tools and environments. Moreover, OpenAgri launched the OpenAgri Catalogue of Open-Source Agricultural Digital Solutions (<https://horizon-openagri.eu/open-source-catalogue/>), which presents more than 190 solutions, and was used as a key input for the Agri-stack catalogue. OpenAgri has received funding from the EU's Horizon Europe research and innovation programme under Grant Agreement no. 101134083.