Annex II – Swot Analysis by Specific Objective[1]

The SWOT analysis under this Annex and under Chapter 2 of the CAP SP takes into account the main needs emanating from relevant sectoral strategies, including the National Agricultural Policy for the Maltese Islands 2018-2028, the National Energy and Climate Plan 2030, Malta's Low Carbon Development Strategy 2021, Malta's Prioritized Action Framework, National Biodiversity Strategy and Action Plan (NBSAP), Malta's National Strategy for Preventing and Mitigating the Impact of Invasive Alien Species (IAS) (2020), National Strategy for Research and Innovation in Energy and Water (2021-2030), the Long Term Waste Management Plan 2021 - 2030, Malta's Strategy and Action Plan for the Prevention and Containment of Antimicrobial Resistance in Malta (2020 – 2028), Malta's Nitrates Action Programme, Malta's draft National Health Systems Strategy 2020-2030, Gender Equality & Mainstreaming Strategy & Action Plan 2022-2027, Malta Tourism Strategy 2021-2030, National Research and Innovation Strategy 2020, Malta's Smart Specialisation Strategy 2021-2027 amongst others.

Specific Objective 1: Support viable farm income and resilience of the agricultural sector across the Union in order to enhance long-term food security and agricultural diversity as well as to ensure the economic sustainability of agricultural production in the Union

Context and evidence

Malta's approximately 10,000 land-based farms are mostly much smaller than the EU average: 69.7 per cent of agricultural holdings have a Utilised Agricultural Area (UAA) of less than 1.0 hectare.[2] Estimates from the 2010 agricultural census indicated a total UAA of 11,445 hectares, but the Agricultural Census of 2020 concluded that this area had declined by nearly 6.2 per cent to 10,730ha and was used by 10,449 holdings (2020 census), of which just over forty per cent report that they produce only for home consumption. Medium-sized agricultural holdings that managed between one to five hectares of land amounted to 2,904 (27.8 per cent), while 265 holdings (2.5 per cent) were considered large, managing over five hectares of UAA.[3] Table 1.1 shows a comparison of 2010 and 2020 data showing a decline in some areas of the agricultural sector, whilst Table 1.4 indicates the agricultural holdings by size and class of utilized agricultural area, showing that the majority of Maltese farms fall under 1 ha of UAA. The micro-farming nature of Maltese farms is a result of land scarcity, topography, an extremely high density of population and inheritance regulations that result in land fragmentation, even on tenanted holdings[4]. Many farms (more than three-quarters) are managed on a part-time basis by family members whose main employment is not in agriculture, and about half of all farmed land is rented from the government with the other half split between rental from private landowners and owner-occupancy (Table 1.3). The latest agricultural census confirmed that there were 4,327 agricultural holdings (41.4 per cent) whose produce was solely for their own consumption, while the remaining 6,122 holdings (58.6 per cent) sold all or a share of their produce.

[1] Data referred in this Annex is referenced as in January 2022

[2] NSO, News Release, Census of Agriculture 2020, 1 February 2022, https://nso.gov.mt/en/News_Releases/Documents/2022/02/News2022_015.pdf

[3] Ibid.

[4] National Agricultural Policy for the Maltese Islands 2018 – 2028, Parliamentary Secretary for Agriculture, Fisheries and Animal Rights, https://agrikoltura.gov.mt/en/agricultural_directorate/Documents/nationalAgriculturalPolicy/napFinal.pdf

The former was responsible for the cultivation of 1,835 hectares (17.1 per cent) of all utilized agricultural area, while the latter cultivated the remaining 8,895 hectares (82.9 per cent). The distribution of agricultural holdings by region and the use of production can be seen in Table 1.2.

Table 1.1 Agriculture Census, 2020: Key Findings, a comparison with 2010 and 2020

	2010	2020	% change
Number of holdings	12,268	10,449	-14.8
Utilised agricultural area (ha)	11,445	10,730	-6.2
Unutilised agricultural area (ha)	242	346	43.0
Number of workers: ≥ 1800 hours	1,300	1,798	38.3
Number of workers: < 1800 hours	16,912	11,713	-30.7
Livestock population in heads:			
Cattle	15,688	14,447	-7.9
Sheep	11,873	16,177	36.3
Goats	4,384	5,764	31.5
Pigs	70,593	40,090	-43.2
Broilers	846,143	696,010	-17.7
Laying hens	300,667	338,516	12.6

Source: Census of Agriculture 2020, NSO 2022

Table 1.2 Distribution of agricultural holdings region /district and the use of production[5]

Use of production	MALTA	Malta	Southern Harbour	Northern Harbour	South Eastern	Western	Northern	Gozo & Comino
Total agricultural holdings	**10,449**	**8,334**	**796**	**768**	**2,082**	**2,514**	**2,174**	**2,115**
of which:								
Own consumption	**4,327**	**3,578**	384	430	884	960	920	**749**
Sold a share of their produce[1]	**6,122**	**4,756**	412	338	1,198	1,554	1,254	**1,366**

[1] A share of the produce sold through different market niches

Source: Census of Agriculture 2020, NSO 2022

[5] The standard output (SO), of an agricultural product is the average monetary value of the agricultural output at farm-gate price. The SOexcludes direct payments, value added tax and taxes on products.

Table 1.3 Distribution of land by region/district and type of tenure

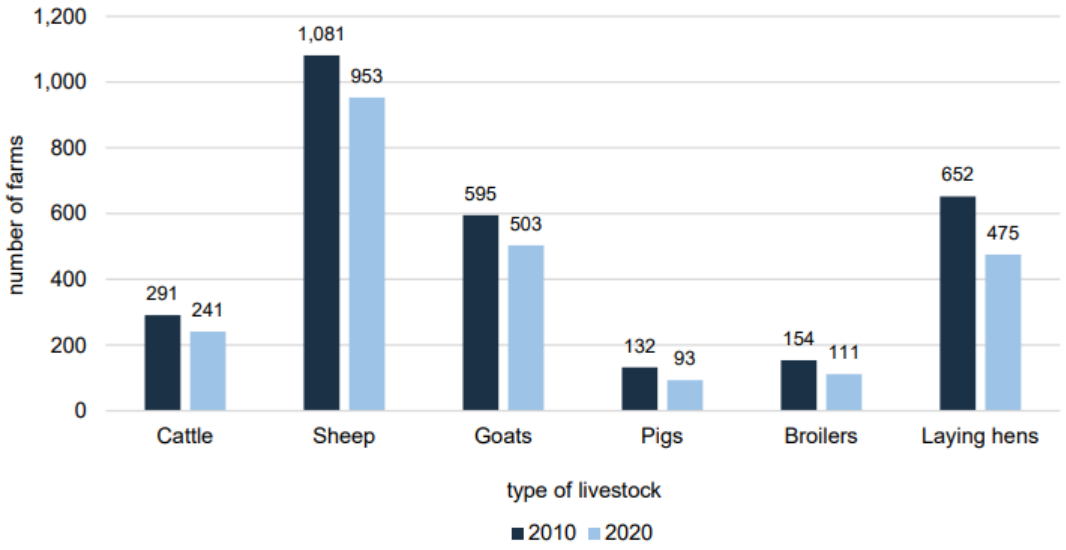
Type of tenure	MALTA	Malta	Southern Harbour	Northern Harbour	South Eastern	Western	Northern	Gozo & Comino
Total land declared (ha)	**11,402**	**8,785**	**440**	**257**	**1,915**	**3,475**	**2,698**	**2,617**
of which:								
Owner occupied	**3,184**	**2,295**	131	82	588	901	594	**888**
Rented from Government	**5,656**	**4,510**	166	95	767	1,808	1,675	**1,146**
Rented from private owners	**2,562**	**1,979**	144	80	560	766	429	**583**

Note: Totals may not add up due to rounding.

Source: Census of Agriculture 2020, NSO 2022

In 2020, Malta had a total of 241 cattle farms with a cattle population of 14,447 heads of which, 5,996 were dairy cows, which represents a decline of 7.9 per cent in the cattle population from 15,688 heads in 2010. A decrease of 17.2 per cent was also recorded over the 10-year period in the number of cattle farms, from 291 farms in 2010 to 241 in 2020. During 2020 the number of reared sheep stood at 16,177 heads. Although there was a decline of 11.8 per cent in the holdings engaged in this activity from 1,081 holdings in 2010 to 953 holdings in 2020, the sheep population increased by 36.3 per cent over this 10-year span. Similarly, the number of reared goats increased by 31.5 per cent, from 4,384 heads in 2010 to 5,764 in 2020 whereas the number of holdings in this activity declined by 15.5 per cent, from 595 holdings in 2010 to 503 in 2020. On a similar trend, the pig population stood at 40,090 in 2020 marking a decline of 43.2 per cent over 2010. Also, the number of pig farms in Malta declined by 29.5 per cent over the same 10-year period, from 132 farms in 2010 to 93 farms in 2020. This distribution is further illustrated in Chart 1.1.

Chart 1.1 Distribution of Farms by type of livestock



Source: Census of Agriculture 2020, NSO 2022

Table 1.4 Distribution of agricultural holdings by size and class of utilized agricultural area (UAA)

	MALTA	Malta	Southern Harbour	Northern Harbour	South Eastern	Western	Northern	Gozo & Comino
Total agricultural holdings	**10,449**	**8,334**	**796**	**768**	**2,082**	**2,514**	**2,174**	**2,116**
size class of UAA (ha):								
0	**462**	**375**	55	51	104	96	69	**87**
> 0 - < 0.5	**4,487**	**3,659**	392	378	1,005	1,028	856	**828**
≥ 0.5 - < 1	**2,331**	**1,814**	170	167	436	582	459	**517**
≥ 1 - < 2	**1,795**	**1,427**	111	105	342	472	397	**369**
≥ 2 - < 5	**1,109**	**877**	60	59	167	291	300	**232**
≥ 5 - < 10	**265**	**182**	8	8	28	45	93	**83**

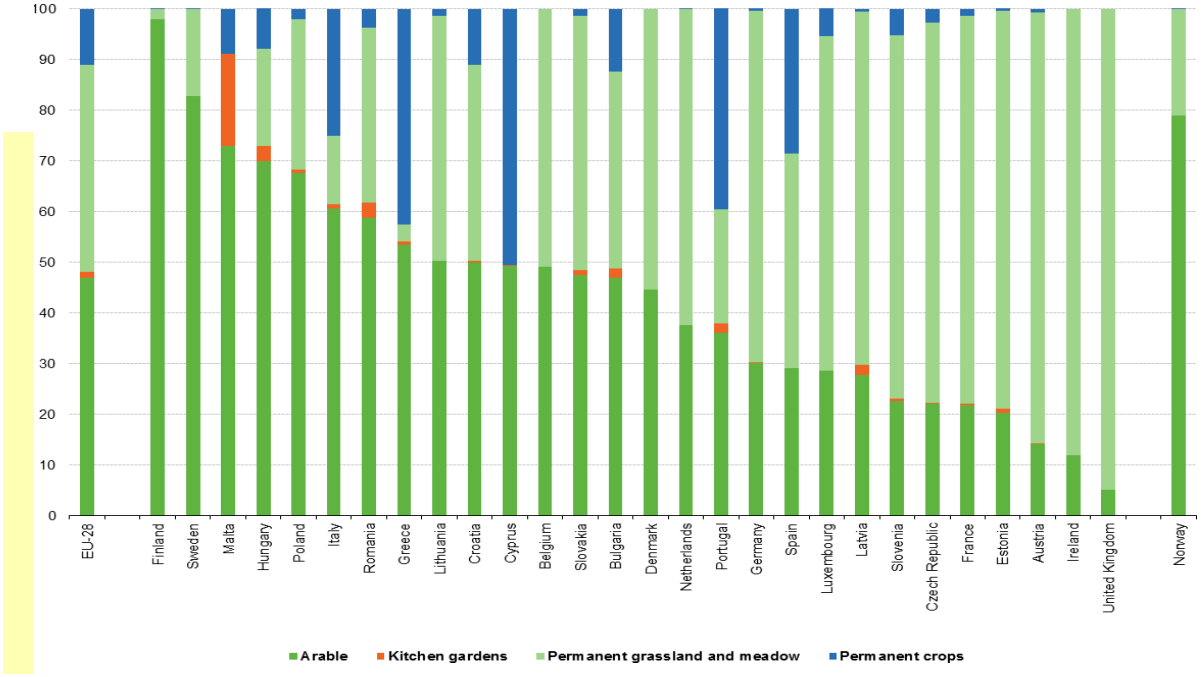
Table 1.5 Main indicators for EU farm holdings, by physical size of farm, 2013

	Number of farm holdings (thousands)			Utilised agricultural area (thousand hectares)			Standard output (million EUR)			Farm labour force directly working on the farm (thousand AWU)			Livestock units on holdings with livestock (thousand LSU)		
	All farms	Very small and small	Large farms	All farms	Very small and small	Large farms	All farms	Very small and small	Large farms	All farms	Very small and small	Large farms	All farms	Very small and small	Large farms
EU-28	10 841	9 353	337	174 614	32 276	90 966	331 105	107 887	110 792	9 509	6 471	1 188	130 174	40 046	40 609
Belgium	38	17	2	1 308	150	320	8 407	2 316	1 170	57	23	5	3 584	1 080	385
Bulgaria	254	239	6	4 651	350	3 891	3 336	1 027	1 968	320	253	44	1 025	721	167
Czech Republic	26	14	5	3 491	107	3 065	4 447	631	3 480	105	20	72	1 728	480	1 131
Denmark	39	17	8	2 619	158	1 808	9 580	1 441	6 393	54	15	25	4 133	669	2 883
Germany	285	128	35	16 700	1 257	9 514	46 252	7 301	20 440	523	147	158	18 407	2 938	6 802
Estonia	19	14	2	958	92	704	676	111	491	22	8	11	310	88	192
Ireland	140	60	5	4 959	658	1 152	5 013	652	887	164	53	9	5 929	899	795
Greece	710	676	1	4 857	2 049	1 689	8 103	6 217	320	464	413	3	2 143	1 627	59
Spain	965	758	52	23 300	3 559	12 939	35 979	16 129	9 049	814	484	134	14 502	7 409	3 051
France	472	202	98	27 739	1 164	17 170	56 914	10 977	24 481	725	211	221	21 871	2 787	9 741
Croatia	157	147	1	1 571	557	629	2 029	1 080	427	175	152	6	864	545	108
Italy	1 010	880	15	12 099	4 171	3 259	43 794	20 066	7 608	817	563	53	9 374	3 340	1 911
Cyprus	35	34	0	109	58	19	495	337	45	17	14	0	175	126	10
Latvia	82	67	3	1 878	406	996	990	206	536	82	52	14	486	125	203
Lithuania	172	150	5	2 861	801	1 334	1 919	576	900	145	98	24	839	353	260
Luxembourg	2	1	0	131	4	70	314	27	162	4	1	1	165	3	93
Hungary	491	461	8	4 657	708	3 001	5 578	1 790	2 852	434	316	71	2 259	1 058	925
Malta	9	9	0	11	11	0	97	96	0	4	4	0	35	35	0
Netherlands	67	38	2	1 848	255	369	20 498	9 216	2 066	153	80	11	6 602	2 983	446
Austria	140	98	3	2 727	724	448	5 671	1 941	389	111	60	5	2 439	829	69
Poland	1 429	1 295	11	14 410	6 943	3 044	21 797	11 394	3 565	1 919	1 616	53	9 165	4 569	1 139
Portugal	264	241	6	3 642	814	2 107	4 509	2 196	1 152	323	266	22	2 036	947	612
Romania	3 630	3 591	13	13 056	5 675	6 300	11 990	7 848	3 278	1 553	1 445	65	4 975	4 049	495
Slovenia	72	69	0	486	334	34	1 009	661	70	82	73	2	488	321	25
Slovakia	24	19	2	1 902	80	1 719	1 812	266	1 424	51	13	34	645	159	452
Finland	54	20	5	2 282	218	705	3 398	563	991	58	13	10	1 173	128	422
Sweden	67	37	8	3 036	334	1 677	4 679	627	2 789	59	19	19	1 715	262	962
United Kingdom	185	71	41	17 327	639	13 003	21 819	2 196	13 859	275	59	116	13 106	1 516	7 270
Norway	43	25	1	996	242	94	3 410	1 099	275	44	19	2	1 241	429	63

Note: very small and small farms are defined by a utilised agricultural area < 20 hectares; large farms are defined by a utilised agricultural area ≥ 100 hectares.

Source: Eurostat 2016, based on Farm Structure Survey

Figure 1. 1. Share of UAA on very small and small farms in ESU, by crop, 2013 (% of total)



Source: Eurostat 2016

A very small number of farms in Malta comprise diversified enterprises which add value in various ways (e.g. direct sales, processed products, agro-tourism facilities). Farm structure survey data suggests that around 270 farms were diversified in this way in 2010.[6]

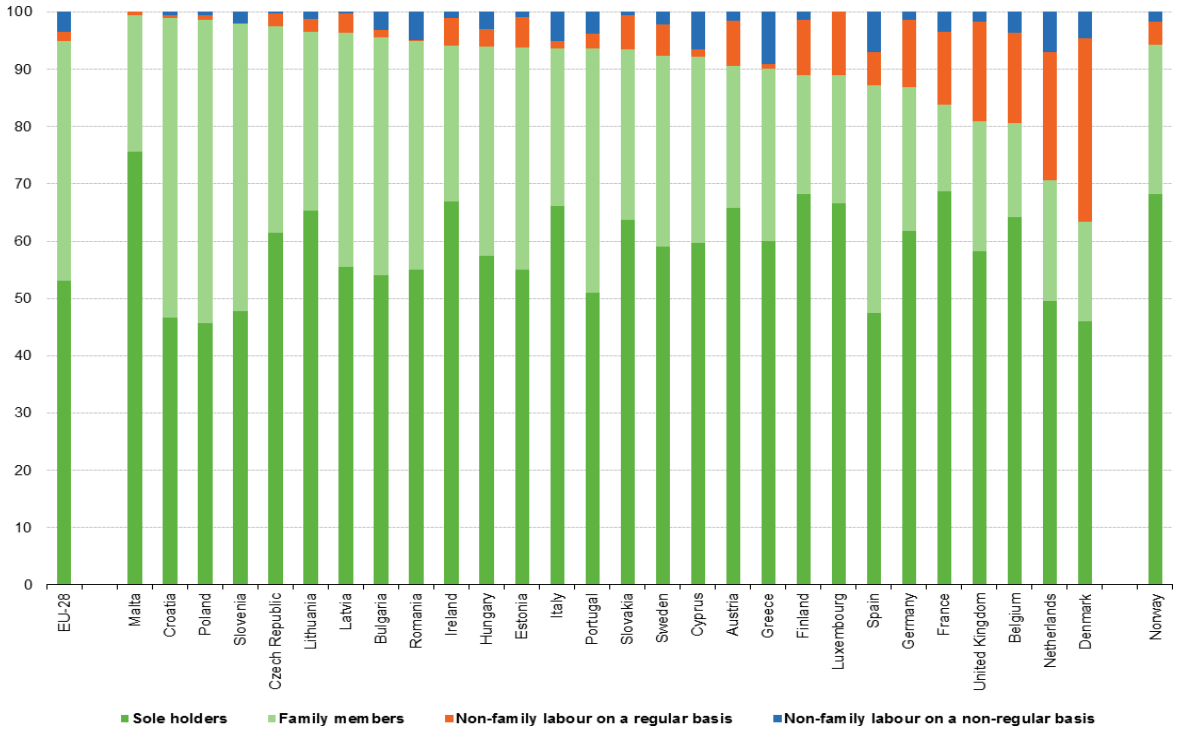
These structural characteristics are unusual among Member States of the EU and are influenced by Malta's topographical, climatic, geographic, and socio-economic characteristics. Most agricultural land in Malta is government-owned but leased long-term to sitting tenants, often for very low rents known as '*qbiela*'. Through inheritance patterns, holdings are often split between heirs when the sitting tenant dies, fragmenting the tenancy. The resulting pattern and tradition of land tenure is complex, and this restricts opportunities for new entrants (Malta Agricultural Policy, 2017). EC calculations based on FADN data suggest that Malta's farms have a relatively low ratio of liabilities to assets (below 5%), suggesting low capitalization and low debts.[7]

Malta's farm labour force is almost entirely composed of sole farmers and family members (Figure 1.2).

[6] This definition does not include farms where the household has non-farm income from other businesses or employment, which are likely more common, but on which data is lacking.

[7] DG Agriculture and Rural Development (2020) CAP Specific Objectives Brief 1 – Ensuring viable farm income. European Commission, Brussels. NOTE that Maltese farms may not have formal loans but could still be reliant on family/non-farm and informal sources of finance to support their development.

Figure 1.2. Labour force working on very small and small farms in ESU by type of labour, 2010 (% of total labour force in AWU)



Source: Eurostat 2016 based on Farm structure survey

For Malta's full-time farms, the aim to ensure *viable farm income* implies that each farm should generate an income capable to support its workforce and, for family businesses, make a significant contribution to household income. For part-time farms, which are much more numerous in Malta, viable farm income can mean that the farmer gets a reasonable financial return from time spent farming; a return which is comparable to what they might get if working in other primaryor secondary sector occupations, for the same proportion of their time. The rationale for this is that without such a level of return, the sector would be considered non-viable because people will choose to devote their time to other, more productive, and remunerative occupations instead of farming and farms, and agricultural land would be gradually abandoned.

In this regard, Malta's recent economic performance as well as high employment rates [8], has placed pressure on the farming sector in terms of ensuring capacity and resources. In the period since Malta joined the EU, agricultural income per AWU has seen a fairly steady and significant decline (Figure 1.3). Compared to other Member States, evidence shows that Maltese farm incomes (measured in both Farm Family Income and Farm Net Value Added per AWU) were significantly lower than the EU-27 average in 2010-2012, and particularlylow in sectors including field crops, horticulture and ruminant livestock, although for dairy cows, incomes were close to the EU average. Uniquely, in all sectors, incomes had declined over the previous10 years (EP, 2015)[9]. Paid wages in agriculture were also lower than the EU average, at 5 Euros/hour,compared to the EU-27 average rate of 7 Euros/hour (EP, ibid). These factors indicate that the sector is vulnerable to ongoing shrinkage and decline.

Table 1.6 – Total employment (number of persons) in agriculture by hours of employment, NSO, Agriculture and Fisheries (2020)

Hours worked/age group	MALTA	Malta	Southern Harbour	Northern Harbour	South Eastern	Western	Northern	Gozo & Comino
Total agricultural labour force	**13,511**	**10,921**	**1,005**	**928**	**2,925**	**3,146**	**2,917**	**2,590**
< 1800 hours by age group	**11,713**	**9,412**	**858**	**813**	**2,566**	**2,722**	**2,453**	**2,301**
<25	**208**	**171**	8	1	79	41	42	**37**
25-34	**866**	**688**	58	44	199	201	186	**178**
35-44	**1,680**	**1,381**	140	129	422	383	307	**299**
45-54	**2,155**	**1,706**	162	153	446	481	464	**449**
55-64	**2,980**	**2,407**	200	217	611	714	665	**573**
65+	**3,824**	**3,059**	290	269	809	902	789	**765**
≥ 1800 hours by age group	**1,798**	**1,509**	**147**	**115**	**359**	**424**	**464**	**289**
<25	**44**	**33**	4	1	7	8	13	**11**
25-34	**141**	**112**	17	8	17	27	43	**29**
35-44	**277**	**231**	28	24	49	52	78	**46**
45-54	**319**	**253**	19	24	52	66	92	**66**
55-64	**502**	**429**	33	31	93	137	135	**73**
65+	**515**	**451**	46	27	141	134	103	**64**

Note: In statistical terms, 1,800 hours is equivalent to one annual work unit.

Table 1.7 Total employment (number of persons) in agriculture by AWU

Number of persons						
Year	Total	0 - 25% AWU	25 - 50% AWU	50 -75% AWU	75 - 100% AWU	>100% AWU
2005	17,968	13,624	1,788	578	432	1,546
2007	17,148	12,591	1,635	672	486	1,764
2010	18,539	12,653	2,694	1,041	850	1,301
2013	19,066	13,395	1,969	1,311	1,017	1,372

Source: Agriculture and Fisheries 2020, NSO, 2016

Figure 1.3 Agricultural income per AWU, Malta

Source: Eurostat Agriculture, forestry and fisheries statistics, 2019

The challenging market conditions faced by producers on such small islands as Malta, Gozo and Comino, who face increased costs compared to those in mainland Europe because of high reliance upon importation of inputs; combined with geophysical and natural limitations, mean that Maltese farmers are at a comparative cost and income disadvantage relative to farmers in most other EU Member States. This disadvantage is structural and cannot easily be overcome. The COVID-19 pandemic, and more recently the conflict in Ukraine, have exacerbated such problems, since they have brought about a further increase in shipping costs that have led to a significant increase in the cost of inputs, together with supply chain disruptions. Such factors have an impact on Malta's food security.

The small size of most Maltese farms means they gain few economies of scale in production – for example, being unable to use large-scale, time-saving equipment for planting, treatments and harvesting either due to the small physical size of holdings or due to the fact that the cost of purchasing equipment would be disproportionate when compared to the output of the holding. There are therefore intrinsic limitations that impinge on the agriculture sector, limiting its income generation.

The Agricultural Policy for Malta (2017)[10] notes that the various economic constraints faced by farmers limit generational renewal; the sector is not attracting enough young farmers willing to work on farms, mainly due to low incomes and lack of capital for investment in machinery and equipment. These factors mean there is a rationale and need for income support, as well as support for investments and other efforts to help enhance market conditions and promote competitiveness in the agricultural sector as a whole[11].

As regards the role of the CAP in supporting farm incomes, FADN data for the past decade for Maltese farms is summarised in Table 1.8. This shows the level of income decreased following the global recession and has since grown, but only to around two-thirds of that seen at the time of EU accession. Farm incomes in 2018 were only around 52% of the national average earnings per capita of €18,207 in Malta (EC analytical factsheet 2019), showing that they fail to match incomes in many other sectors. The figures also indicate the importance of CAP support as a proportion of farm income, in the agricultural sectors to which it currently applies, typically making up one-quarter of net farm income for a full-time farm in 2016 and 2017, although this share has declined from double that level since 2007.[12]

Table 1.8: FADN data for full-time farms in Malta (sourced from Eurostat, March 2020)

Yea r	**Total Output** (€ per farm)	**Growth in output**	**Net income** (€ p	**Growth in net income**	**Total subsidies**[13] (€	**Growth in t**	**Subsidi es as % net**

[10] National Agricultural Policy for the Maltese Islands 2018 – 2028, Parliamentary Secretary for Agriculture, Fisheries and Animal Rights, https://agrikoltura.gov.mt/en/agricultural_directorate/Documents/nationalAgriculturalPolicy/napFinal.pdf

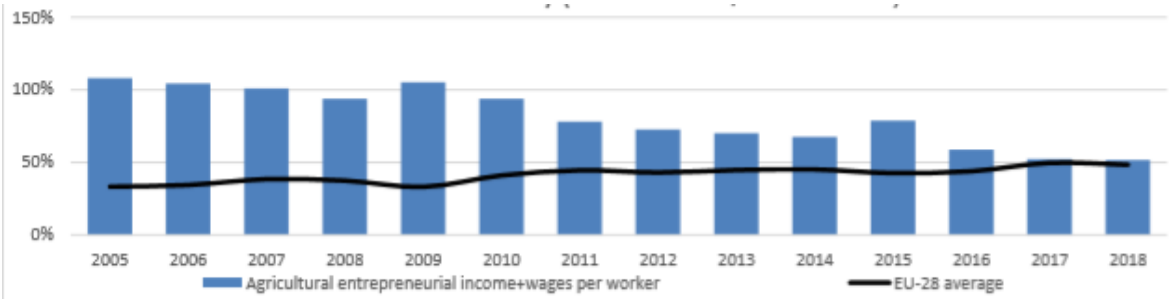
[11] Ibid.

[12] This figure shows that farmers are relying less heavily on subsidies, but this figure may also be showing that less investment is taking place. No grants for investments were available in 2016 and 2017. New project funds were awarded late 2017-early 2018; those from the 2007 -13 RDP were used by 2015.

[13] Includes both EAGF and EAFRD CAP interventions, including investment aids, other EAFRD interventions, decoupled payments and other

			er farm)		per farm)	**otal subsidies**	**income**
2007	40,877	13.00%	17,232	22.77%	8,716	23.04%	50.58%
2008	43,626	6.73%	15,503	-10.03%	9,605	10.20%	61.96%
2009	35,989	-17.51%	8,341	-46.20%	3,876	-59.65%	46.47%
2010	33,240	-7.64%	9,680	16.05%	5,530	42.67%	57.13%
2011	32,619	-1.87%	7,411	-23.44%	4,214	-23.80%	56.86%
2012	39,600	21.40%	9,614	29.73%	3,785	-10.18%	39.37%
2013	42,180	6.52%	11,426	18.85%	3,541	-6.45%	30.99%
2014	41,770	-0.97%	11,868	3.87%	3,813	7.68%	32.13%
2015	42,797	2.46%	12,718	7.16%	4,196	10.04%	32.99%
2016	43,710	2.13%	11,215	-11.82%	2,723	-35.10%	24.28%
2017	42,444	-2.90%	11,331	1.03%	2,783	2.20%	24.56%

Figure 1.4: Agricultural entrepreneurial income and wages, Malta, compared to EU-28



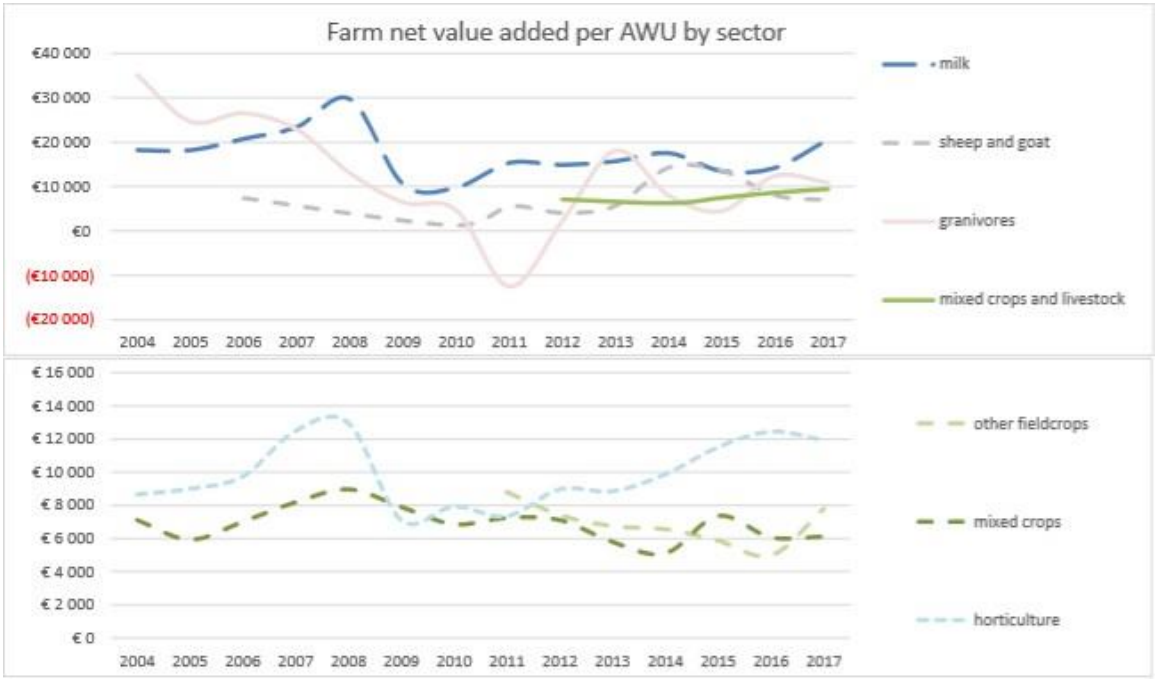
Source: DG AGRI Eurostat

direct payments under EAGF interventions (voluntary coupled support or VCS). Altogether, VCS is much the largest single component of subsidy per farm, accounting for around 60% of total subsidies in 2016 and 2017. This is paid to farms in the dairy, beef/veal, milking sheep/goats and processed tomato sectors only.

The average agricultural factor income per worker in Malta has declined steadily since EU accession and reached its lowest level of € 9,560 in 2018 (Figure 1.4).

Income per worker decreased in particular in the pig and poultry sector. The agricultural income per worker is above average for granivores, dairy cattle and horticultural farms. It is below average for sheep and goat farming and mixed crops.[14] There are no large-scale farms in Malta. Smaller farms receive lower incomes per worker. FADN data suggests that the most productive farms in Malta (expressed as income per AWU) are those of 5 to 10 hectares – i.e. much larger than the 0.9ha average.

Figure 1.5: Farm net value by sector

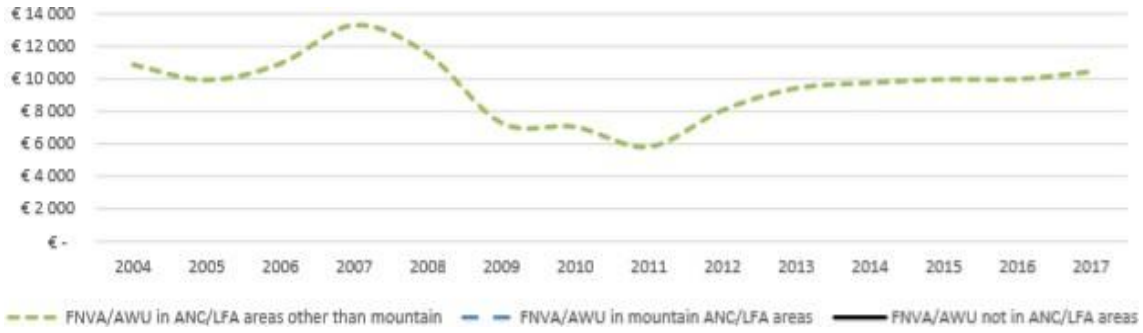


Source: DG AGRI- FADN

In Malta, the Small Farmers Scheme was claimed on 42% of the total Utilised Agricultural Area in 2018, while the Basic Payment Scheme was paid on 22% - implying that 36% of farmland area did not receive EAGF payments, largely because the holding size was too small to qualify. Because all agricultural land is considered to face natural constraints in Malta, 9.25% of its Rural Development envelope (total public expenditure) was programmed for Areas of Natural Constraint. This aid is paid on areas as small as 0.1124 hectare, meaning that it reaches a larger share of farm holdings than interventions under EAGF.

[14] EC (2019) Analytical factsheet for Malta p.3, analytical_factsheet_mt.pdf (europa.eu).

Figure 1.6 Agricultural factor income/ worker in Areas with Natural Constraints, Malta



EU food security

With a high resident population of 520,971 at the end of 2021[15] and a total territory of only 316 km^2 Malta has the highest population density in the EU, as well as a visitor population over 2.5 million per annum reaching 2.8 million in 2019[16], it is unrealistic for Malta to aim to be self-sufficient in all temperate products, and significant food importation is, and will remain, necessary. Nevertheless, the country can reach fairly high levels of self-sufficiency for permanent residents in some products. To contribute to enhanced EU food security, farms should most appropriately aim to make a significant contribution to domestic consumption in those products for which they are best suited, in respect of geo-climatic conditions and market opportunities.

The relative importance of domestic versus imported agricultural produce can be seen from the total agricultural produce during 2020. The total exported agricultural produce amounted to 106 million, whilst the total agricultural products imported amount to 516 million which is substantially greater than the total amount of exports.[17]

Table 1.9: Agricultural Trade in 2020

[15] NSO, News Release, World Population Day: 2021, https://nso.gov.mt/Home/Visualisation/Pages/Infographics/World-Population-Day.aspx
[16] NSO, News Release, Inbound Tourism: December 2019 https://nso.gov.mt/en/News_Releases/Documents/2020/02/News2020_017.pdf
[17] EU Country Factsheets,2021 https://agriculture.ec.europa.eu/cap-my-country/performance-agricultural-policy/agriculture-country/eu-country-factsheets_en.

Agricultural trade in 2020

By category of product	Total trade	Trade with EU countries		Trade with non-EU countries	
	Million EUR	Million EUR	% change 2020/2019	Million EUR	% change 2020/2019
Exports					
Commodities	4	0	-80.9%	4	18.6%
Other primary products	1	0	-47.0%	0	128.8%
Processed products	2	1	-35.4%	2	206.4%
Food preparations	89	2	3.7%	87	-6.5%
Beverages	4	2	-21.7%	1	-25.7%
Non edible	6	1	541.5%	1	-80.4%
Total agricultural products	106	6	0.4%	95	-5.5%
as % of total exports	4.5%	0.6%		8.0%	
Imports					
Commodities	73	51	2.8%	22	5.2%
Other primary products	117	101	-11.3%	16	-18.3%
Processed products	117	101	-10.1%	16	-4.3%
Food preparations	140	103	-10.3%	37	-5.2%
Beverages	41	30	-26.3%	11	-33.1%
Non edible	28	27	-10.8%	1	18.1%
Total agricultural products	516	413	-10.5%	103	-9.05%
as % of total imports	11.2%	15.7%		5.3%	
Balance					
Commodities	- 70	- 51		- 19	
Other primary products	- 116	- 100		- 16	
Processed products	- 115	- 101		- 15	
Food preparations	- 50	- 101		51	
Beverages	- 37	- 28		- 9	
Non edible	- 22	- 26		- 1	
Total agricultural products	-410	- 407		- 8	

Source: Directorate General for Agriculture and Rural Development, based on COMEXT data Updated: June 2021

Looking ahead, the most significant market opportunities for Maltese agricultural produce are:

1. In those sectors and products which are perishable and heavy and thus costly to transport across the sea or by air. These include fresh vegetables and some fruit; and notably, fresh, liquid milk for which Maltese people have a particular consumer preference. In recent years, Maltese dairy cows produced 85% of domestic consumption of fresh milk in Malta (National Statistics Office, 2016)[18].

2. In sectors and products where Malta has a particular specialist knowledge and cultural traditions. This range of products includes traditional goat and sheep milk cheeselets '*Ġbejna*'; some endemic varieties of olives (*bidni*) and vines (*Ġellewża* (red) and *Girgentina* (white)); small and very sweet tomatoes most suited to tomato paste '*Kunserva*' production; rabbits bred for meat; and Maltese honey produced from the distinct and diverse flowers of the garigue.

[18] NSO, Agriculture and Fisheries, 2014 https://nso.gov.mt/en/publicatons/Publications_by_Unit/Documents/B3_Environment_Energy_Transport_Agriculture_Statistics/Agriculture_and_Fisheries_2014.pdf

Because of the relatively high proportion of Malta's farms that are part-time, as well as the significant share that can be considered semi-subsistence, volatility in markets is perhaps less of a threat to the continuation of farming than it would be if all Malta's agricultural land were managed by full-time farms, with no other sources of income. Despite this, local producers also supply the tourism and catering industry, two sectors that in 2020 and 2021 have been heavily impacted by the COVID-19 pandemic. As a consequence, many farmers lost their main clients, resulting in excess produce and plummeting prices. The situation was further exacerbated by the increase in shipping costs of inputs brought about by the COVID-19 pandemic and later by the conflict in Ukraine. This has further impacted the profitability of the sector. Other external factors, such as import bans of certain products by third countries, resulted in excess produce within the EU market, outcompeting domestic products produced at much higher cost.

The National Agricultural Policy identifies the need for a risk insurance that supports farmers in the event of damage to livestock or crops. The consultation process that led to the drafting of the RDP 2014 – 2020 also identified the need for this tool and such a measure was then programmed. Its intention was to provide access to insurance covering losses caused by an adverse climatic event; an animal or plant disease; a pest infestation or an environmental incident, with the aim of providing some financial stability to farmers. In the context of climate change and anticipated increase in extreme weather events, such a tool could prove valuable in helping to sustain agriculture. Despite the programming of the respective measure in the RDP 2014-2020, no such products have been made available on the local market and limited availability of data has discouraged service providers from bidding to provide such a service. Whilst risk management remains a relevant need, in the past, in the case of adverse climatic events including natural disasters, which provoked losses for farmers, the state aid acquis provided more pragmatic and feasible means of redress. Within this context, in the 2023-2027 period, Government intends to continue to resort to the provisions of the Agriculture Block Exemption Regulation (ABER) in order to provide financial support to farmers and other operators to mitigate the impact of climatic conditions and other occurrences which may in certain instances be up to 100% of the damage incurred. In addition, support may also be provided through measures implemented under the Commission Regulation on De Minimis Aid in the agriculture sector. In both circumstances support is foreseen through national funds.

Strengths

Malta has a diverse range of products and production skills, and large proximal market offering significant advantages for local farmers. The demands of both domestic consumers and visitors ensure that a wide range of food products is purchased and consumed within Malta, on a consistent basis.

Farmers produce a diverse range of products, providing local consumers with a wide range of fresh produce, including fruit and vegetables and livestock products such as eggs, meat and fresh milk. Another strength arising from Malta's island status and small size is comparatively low transportation costs and short supply chains for domestic produce, with relatively few intermediaries which should mean that consumers are offered produce at prices similar to those at the farm gate. Nevertheless,

food prices in Malta are overall comparable to those in other EU Member states[19], reflecting higher production costs and meaning that Maltese producers must compete with imports on the basis of product quality and potential consumer loyalty (to choose Maltese food).

The pluri-activity of many of Malta's farmers is both a strength but also a potential weakness. As a strength, having a diversity of income sources can give some resilience, helping Malta's farm households to better cope with fluctuating market conditions for agricultural inputs and outputs, or extreme and unforeseen weather events which may damage crops and infrastructure, because they have other income sources upon which to draw more heavily, when these things happen.

Well-organised collaborative full-time production in dairy cow and pig sectors, and some market success in fresh milk, amongst others. Some consumer loyalty to buying local and fresh can be seen in higher and/or more stable farm gate prices for certain products e.g. fresh milk, compared to those in other EU MS. Table 1.9 compares producer prices for Milk across the EU in the most recent years for which data is available (Eurostat, 2020), showing that Malta's farm gate milk prices are consistently among the highest of all Member States and significantly above the EU average. Despite this, the consumer is still provided with a freshproduct at a competitive price.

In other sectors, consumer loyalty is less easy to prove because product provenance is not always evident or guaranteed at the point of sale. Nevertheless, typically Maltese products such as rabbit meat, fresh chicken, traditional cheeselets and fresh fruit and vegetables are widely accepted to have a loyal consumer base in Malta, among the resident population.

Table 1.9 Milk Prices in EU Member States[20]

[19] Eurostat : Food price monitoring tool http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=prc_fsc_idx&lang=en

[20] EU Prices of Cow's Raw Milk in Euro/100 kg https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/eu- raw-milk-prices_en.pdf

EU PRICES of COW's RAW MILK in EURO/100 kg

Source: Regulation (EU) No 2017/1185 Article 12(a) - Annex II.4(a) (prices of raw milk at real fat and protein content paid to milk producers)

	Belgium	Bulgaria	Czech Rep.	Denmark	Germany	Estonia	Ireland	Greece	Spain	France	Croatia	Italy	Cyprus	Latvia	Lithuania	Luxembourg	Hungary	Malta	Netherlands	Austria	Poland	Portugal	Romania	Slovenia	Slovakia	Finland	Sweden	EU (without UK)	U.K.
2018m07	30.17	29.36	30.79	37.17	33.19	30.18	31.76	39.53	30.29	33.70	32.16	35.25	56.67	27.65	25.79	31.36	28.04	51.57	35.75	35.33	30.38	30.07	28.45	29.78	30.77	35.86	33.02	33.12	31.26
2018m08	31.82	29.38	31.17	37.15	33.83	30.34	33.41	39.59	30.49	34.63	31.65	35.26	56.68	27.97	25.74	32.49	28.33	53.21	35.75	35.12	30.72	29.79	29.00	29.89	30.82	36.00	33.29	33.63	33.09
2018m09	33.73	29.72	31.96	37.95	35.43	31.61	37.00	39.83	30.78	35.98	33.00	35.44	56.83	28.95	28.15	34.12	28.69	53.64	37.00	36.45	31.60	30.03	28.82	30.96	31.71	37.60	34.70	34.89	34.30
2018m10	35.12	30.30	32.82	37.94	36.63	31.80	38.75	39.61	31.55	36.71	33.84	36.81	56.90	29.34	30.76	36.01	29.57	51.56	38.00	37.86	32.57	31.05	30.52	31.98	32.45	38.87	37.57	35.97	34.60
2018m11	35.69	30.43	33.54	37.93	37.16	32.29	39.04	39.25	32.33	36.73	33.69	37.08	57.82	29.65	31.66	36.75	30.29	51.55	37.25	38.68	32.85	31.84	31.62	32.38	32.92	38.74	37.21	36.21	34.80
2018m12	35.53	30.83	34.50	36.97	36.47	32.11	36.90	38.74	32.04	36.00	34.34	37.20	58.11	29.99	31.39	36.11	30.78	49.55	37.25	39.20	33.20	31.84	32.01	31.95	33.16	38.57	37.44	35.83	32.90
2019m01	33.86	30.94	34.66	34.16	35.47	31.71	34.28	38.88	32.04	35.98	33.96	39.51	58.07	30.21	30.61	34.96	31.08	48.22	36.25	38.25	32.48	31.09	31.46	32.56	33.26	38.27	35.96	35.28	32.51
2019m02	33.71	30.93	34.17	34.17	35.22	32.03	34.38	38.88	32.04	35.91	33.70	39.65	58.16	30.30	30.66	34.16	31.43	46.95	36.50	38.02	32.23	31.71	31.37	32.18	33.03	37.96	35.17	35.20	32.52
2019m03	33.59	30.76	34.21	34.17	34.82	31.57	32.63	38.29	31.65	33.54	33.33	39.32	57.89	30.34	30.56	34.44	31.48	46.71	36.50	37.64	32.39	30.55	31.04	32.27	32.78	37.60	35.04	34.52	32.76
2019m04	32.97	29.96	33.71	34.16	34.49	31.71	31.66	38.23	31.65	35.66	33.26	39.07	57.60	30.26	30.14	34.15	30.87	45.55	36.00	37.84	31.77	30.60	30.22	32.40	32.60	37.56	35.13	34.61	31.84
2019m05	32.48	29.72	33.42	34.15	33.99	31.08	31.47	37.86	31.55	34.84	33.28	39.09	57.14	29.35	28.09	33.59	30.34	45.74	35.25	37.45	31.49	30.25	28.70	32.10	32.61	37.06	34.00	34.12	31.09
2019m06	31.64	29.44	32.99	34.15	33.22	30.47	31.95	38.09	31.17	34.00	32.52	39.09	56.79	28.53	26.43	33.06	30.08	49.07	35.75	36.33	31.02	30.24	28.29	31.62	32.18	36.62	34.34	33.71	30.63
2019m07	31.12	29.66	32.83	34.16	32.93	30.34	31.08	37.93	31.07	35.86	32.44	39.16	57.01	28.44	26.21	32.69	29.83	50.55	35.00	35.97	30.78	30.17	28.43	31.74	31.99	37.27	34.02	33.81	30.82
2019m08	31.50	29.78	32.39	34.18	33.01	30.06	31.95	37.93	31.36	36.40	32.41	39.58	56.92	28.37	26.13	33.11	30.13	51.60	35.00	35.45	30.12	30.21	28.96	32.02	31.67	37.60	33.37	33.95	30.56
2019m09	32.69	30.30	32.56	34.03	33.88	30.30	34.48	38.72	31.65	37.34	32.95	39.69	57.20	28.41	27.52	34.23	30.24	52.12	35.00	35.97	30.41	30.55	29.77	32.65	32.26	38.35	34.30	34.61	32.28
2019m10	33.48	31.02	33.27	34.01	34.65	30.54	36.61	38.21	32.14	37.66	33.65	39.69	57.98	28.68	29.36	34.95	31.63	52.10	34.75	36.43	31.42	30.80	31.65	33.65	32.68	39.55	35.01	35.18	32.68
2019m11	34.15	31.54	33.95	33.99	35.19	30.89	37.29	38.48	33.01	37.46	34.06	39.23	58.33	29.70	30.21	35.78	31.99	53.78	35.50	36.95	32.85	30.85	32.68	34.05	33.03	39.45	35.46	35.59	33.77
2019m12	35.36	31.75	34.25	33.99	35.29	31.32	36.52	38.89	32.82	36.78	34.35	38.70	58.45	30.10	30.62	35.56	32.64	52.36	36.41	37.31	33.33	30.77	32.98	34.16	33.13	39.02	36.08	35.60	33.40
2020m01	34.33	31.96	34.58	33.99	34.94	31.30	34.67	38.82	32.62	36.42	34.44	39.70	58.57	30.21	30.83	35.24	32.55	52.48	36.50	36.70	32.76	30.85	32.48	33.68	33.23	38.51	35.21	35.34	32.89
2020m02	34.33	31.99	34.59	34.00	34.94	31.30	34.46	38.85	32.62	36.12	34.31	39.46	58.57	30.43	30.81	35.14	32.24	52.48	35.75	37.20	32.27	30.85	32.10	33.30	32.14	38.35	35.09	35.13	32.69
2020m03																													
2020m04																													

: Estimations DG AGRI-G3 : Estimations based on National statistics : "estimated" prices by MS (indicator of price movement, not to be relied upon to forecast prices)

Weaknesses

Malta's small and fragmented farm structures are a challenge to those seeking to make a living only from farming, and also to many part-time farmers for whom agriculture provides a supplementary income, due to the additional costs and complexity of managing such holdings. Furthermore, they act as a disincentive to young people coming into the sector and this is linked to a relative lack of generational renewal in farming.

Whilst multiple income sources can be a strength for pluri-active Maltese farm families, for semi-subsistence farmers whose household incomes depend upon a variety of sources, the time and effort that they devote to agricultural production is limited by their need to spend time earning income from other activities. This means that the sector suffers from a lower level of strategic planning, investment, knowledge exchange and research and development, than would be the case if most farming were full-time.

The sector is negatively impacted by low level of skills, investment, knowledge exchange and R&D which limits the further development of the sector and its modernisation and renewal.

In common with other EU island economies, farmers in Malta face higher costs of production for all outputs which require intermediate inputs (such as fertilisers, pesticides and feed) that must be imported, than producers in countries that manufacture or produce their own inputs. The COVID-19 pandemic, and more recently the conflict in Ukraine have brought about a further increase in shipping costs that have led to a significant increase in the cost of inputs, together with supply chain disruptions. FADN data indicates relatively higher costs of production in Malta for all of its major farm sectors for which datais available, including field crops, horticulture and milk production, as well as pigs and poultry.

The pluri-activity of many of Malta's farmers is a potential weakness since being occupied inother employment may be a reason why farms are not optimally managed, because farmers cannot give them sufficient time and attention.

Dated production methods and low levels of training in some sectors may result in inefficient production methods that require higher resource input and negatively impact profitability. Poor quality products due to dated production methods (for example; high reliance upon pesticides and chemical fertilisers, inefficient use of irrigation in crops, or inconsistent or poorly presented livestock products) may also threaten consumers' perception of the value of Maltese agricultural production.

As a consequence of changing climatic regimes, farms are being negatively impacted by droughts, torrential rainfall, hail storms and strong winds that damage both crops and infrastructure, resulting in added expenses for the farmer, further affecting the profitability of the sector. Long summer droughts and extreme storms in winter and changing weather patterns impose harsh conditions on farm production. These extreme conditions pose an important and increasing risks of significant damage to crops and livestock, particularly those in highly exposed areas and those crops produced in polytunnels and greenhouses. Furthermore, extreme weather conditions brought about by climate change can lead to soil erosion and desertification of arable land. These pose an increasingrisk to farm incomes and farm family resilience and a threat to the continued viability and resilience of Malta's farms and farmers.

Opportunities

Appreciation has been increasing with regards the importance of farmers in maintaining and managing the landscape, also as a consequence of the COVID-19 pandemic that has restricted travel for many months, which has led to more locals venturing to rural areas around Malta. Growing consumer appreciation can also be noted with regards to the production of local, healthy food through more sustainable methods of production.

Investing in training and support to young farmers in the many sectors with potential to grow their market share through more professional operations, offers a clear opportunity to benefit incomes and sector viability in the longer-term.

Threats

Low-cost competition from producers in other countries that can benefit from economies of scale can erode the competitiveness of Maltese farmers if consumers are not aware of the benefit of seeking out and buying local produce. In view of limited labelling and traceability, consumers may not be able to distinguish Maltese produce from imported goods.

Declining farm incomes across all sectors and ageing farm population create a negative image of farming among young people, discouraging generational renewal and threatening the continuation of land management in some areas.

Limited labelling and traceability results in consumers not being able to distinguish between local and important produce, therfore limiting the opportunity for local produce to be adequtely

appreciated by consumers and visitors.

Pressure for continued built development on land, to cater for residential properties, holiday accommodation and luxury living, leads to very high agricultural land prices, despite a clear and relatively strict spatial planning regime. These pressures limit the opportunities for Malta's farm sector to restructure in ways which could boost sector incomes and returns.

Implications for needs and the case for intervention

The elements identified in the SWOT indicate a clear need, both in absolute and relative terms, for efforts to sustain viable farm incomes in Malta, in all sectors which are considered important for the future of Maltese agriculture and rural areas.

CAP EAGF and EAFRD interventions can help to support farm incomes and mitigate against the highercosts faced by Maltese farmers, as follows.

- Coupled income support helps to compensate for high feed costs in the dairy and beef sector, the sheep sector, and higher input costs in the specialist tomatoes for processing sector, as a consequence of Malta's insularity, which are of particular significance to Maltese agricultural GVA. The pig sector, also poultry and rabbits may face similar high feed costs but are not eligible for coupled income support; however, it could be valuable to offer these private storage aid when prices are low.

- EAFRD interventions for ANC areas under natural or other area specific constraints help to compensate fruit and vegetable and arable producers for the high costs arising from the very fragmented and small-scale nature of many holdings in Malta. These aids, along with the Basic Income Support for Sustainable farming (BISS and Small Farmers Scheme) under EAGF, help to encourage the good maintenance of farmland and prevent its abandonment.

In addition, the SWOT highlights areas of opportunity that can be developed by appropriate application of funding through CAP EAFRD interventions and by reference to the provisions under elements of CAP EAGF interventions, to add value and thus enhance the viability of different sectors in Maltese agriculture. Key measures and interventions should include further investment in key infrastructure (e.g. to extend access to treated effluent water to more farms and enable updating of equipment and facilities for sheep and goat producers); new livestock rearing and feeding systems with lower environmental and higher animal welfare impacts, and investing in human and social capital to underpin enhanced farm business performance and effective valorisation of Maltese farm products. Many of these actions are also promoted under other SOs, including SOs 2, 3 and 5.

Finally, the SWOT highlights a need to consider better mechanisms for risk management among Maltese farm businesses. As mentioned earlier on, the state aid acquis provided more pragmatic and feasible means of redress, in the case of losses experienced by farmers. Throughout the 2023-2027 period, the provisions of the Agriculture Block Exemption Regulation (ABER) will be expected to be used, in order to provide financial support to the sector, when faced with the impact of climatic conditions Support may also be provided through measures implemented under the Commission Regulation on De Minimis Aid in the agriculture sector. In both circumstances support is foreseen

through national funds.

The needs identified under this Specific Objective, are as follows:

1.1Sustain a viable farm income for farmers in Malta, across all sectors;

1.2Establish risk management tools in Maltese agriculture;

1.3 Improve prevention actions related to possible risks and enable farmers to be financially resilient;

1.4 Facilitate access to new entrants and ensure the sustainability of the agricultural sector

1.5 Reform land tenure laws and develop institutions and incentives to ease access to new entrants;

1.6 Improving product quality and traceability

Among these needs, numbers 1.1, 1.3 and 1.4 have possibilities to be addressed through CAP measures and instruments but 1.5 requires legislative change in Malta, as recognised in the Malta Agricultural Policy, and is therefore not a target for CAP Strategic Plan. Need 1.2 is expected to be financed through national funds whereas 1.6 will be targeted more directly through other SOs.

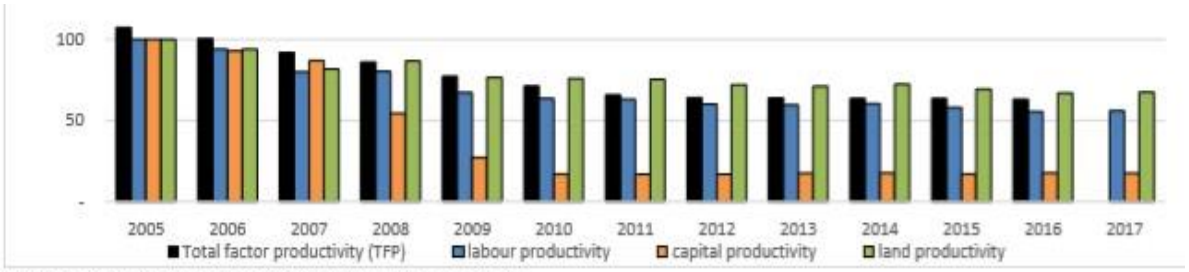
Specific Objective 2: Enhance market orientation and increase farm competitiveness both in the short and long term, including greater focus on research, technology and digitalisation

Context and evidence

Increasing agricultural productivity in a sustainable way is essential to meet the challenges of higher demand in a resource-constrained and climate uncertain world. A number of drivers and policy tools are available to trigger productivity gains in EU agriculture, such as research and innovation programmes, new technologies, rural development and infrastructure, efficient advisory systems and continuous training for farm managers (EC, 2020).

In line with the negative income trends as discussed under SO1, agriculture's total factor productivity (TFP) has decreased in Malta since EU accession. All components of partial productivity decreased with a particular drop for capital, possibly explained by major investment by dairy farmers to meet new EU environmental standards. Production has fallen more than costs, while labour input increased by 23%, between 2005 and 2017 (Figure 2.1).[21] These trends show the negative impact on the farm sector in Malta following EU accession which required the removal of import protection, as well as increased reliance on part-time farm work for low-income families practicing semi-subsistence farming (around 25% of total farms in 2011) resulting from the impact of the global recession of 2008 on other sectors.

Figure 2.1 TFP in Agriculture, Malta

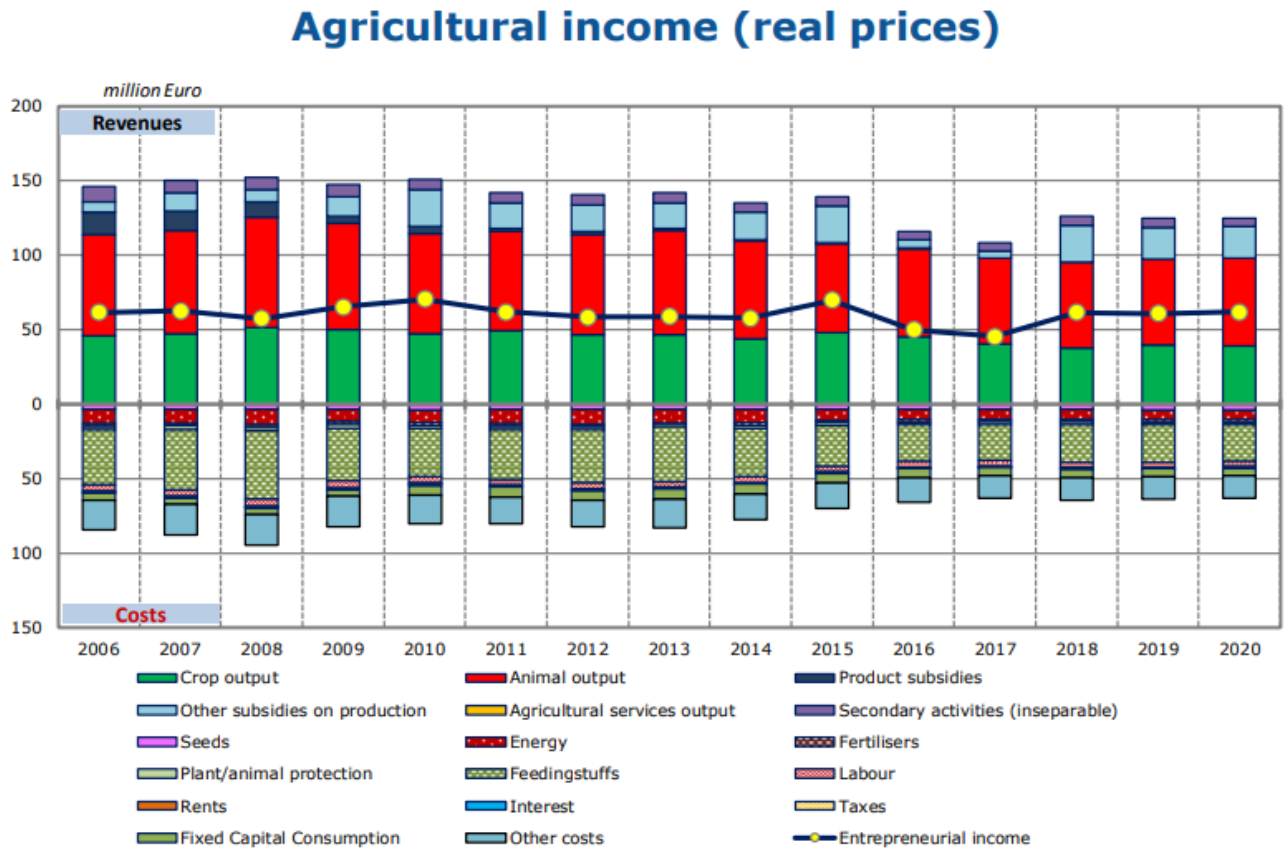


Source: EUROSTAT for TFP and DG AGRI for partial productivity

Labour productivity in agriculture in 2018 in Malta was 11.92 Euros per full time equivalent worker, significantly below the EU average of EUR 18.59. Figure 2.2 shows the structure of farm incomes, illustrating the high costs associated with dependence upon imported feedstuffs and other inputs (e.g. machinery, energy, fertilizers), and the cumulative impact of increased price competition from lower-cost imports on domestic food markets, which has reduced Maltese farmers' market shares in key sectorssuch as livestock products.

[21] EC (2021) Statistical Factsheet for Malta June 2021.

Figure 2.2 Structure of agricultural income (cost/revenue, real prices) in m EUR, Malta



Source: EUROSTAT

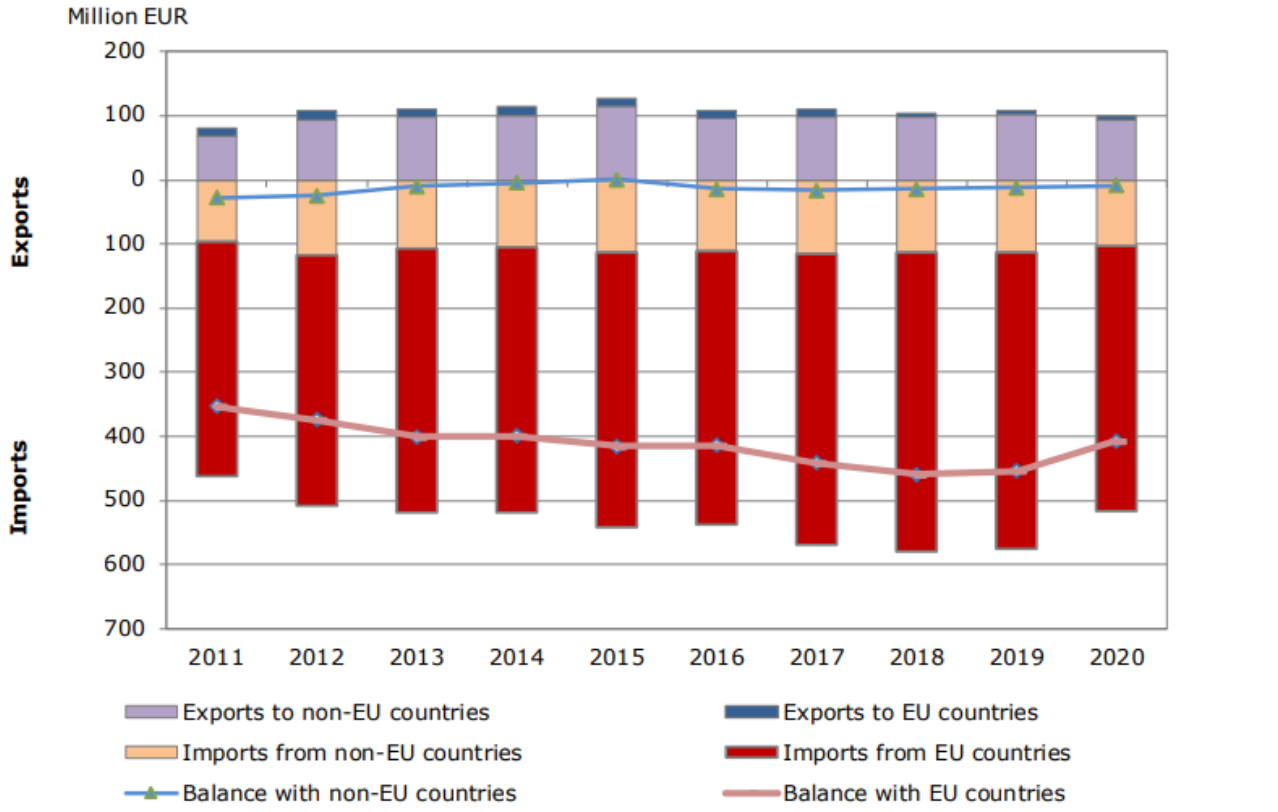
Malta's agriculture is market-focused, producing a wide range of food products to meet both domestic and/or export demand, in different sectors. Nevertheless, it faces challenges:

- in respect of competitiveness and the need continuously to adapt to changing market expectations and consumer demand; also
- in respect of better recognising the need to produce sustainably, in the face of significant resource constraints and emerging impacts of climate change.

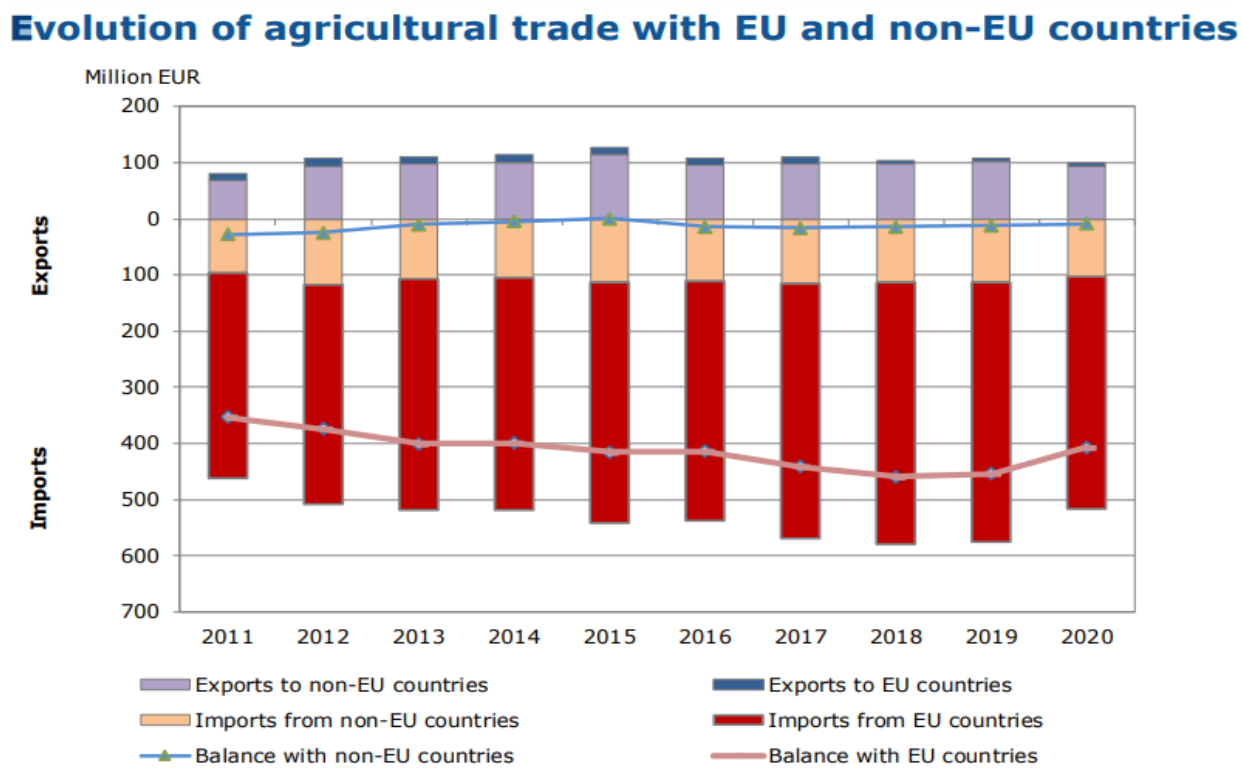
As explored already in SO1, Maltese producers are unlikely to be able to compete with those from other countries on the basis simply of costs of production, given that local production is negatively impacted by limited economies of scale and high input costs, as a consequence of Malta's small size and insularity. The overall agri-food trade balance in Malta is strongly negative, but there is a modest positive trade balance with non-EU countries (Figure 2.3).

Figure 2.3 Structure of Agri-food trade in Malta, 2020

Evolution of agricultural trade with EU and non-EU countries



Source: EC (2021) Statistical Factsheet for Malta June 2021



Source: EC (2021) Statistical Factsheet for Malta June 2021

Maltese products should compete more effectively against imports in those distinct market segments where provenance, cultural heritage and tradition are valued by today's consumers. However, this market advantage is not always realised because of other barriers to effective marketing. As is evident in the case of fresh milk (see SO1 for data), Maltese products may also have potential to compete effectively in markets where product perishability or a clear consumer preference for 'freshness', is strong (e.g. for eggs, fresh cheeselets and some speciality vegetables or soft fruits). This is notwithstanding the recognition that very regular importation of fresh produce from neighbouring Sicily is also an established phenomenon.

Malta's Agricultural Policy (2017) proposes a transition from sole dependence on quantitative production to farm households generating greater value from rural tourism with its potential for diversification of income and short supply chains involving direct sales to tourists (e.g. agri-tourism and farm shops). Although tourism can be a volatile sector (the COVID-19 pandemic has negatively impacted tourism globally, including in Malta), the infrastructure and climate of Malta are likelyto provide reasonably stable conditions to continue to support tourism into the future.

In addition, this aim also places emphasis upon securing better market opportunities for enhanced competitiveness in the domestic food market. Early consumer research[22] identified that Maltese people like to buy Maltese products, and Malta's Food and Nutrition Policy and Action Plan 2015-2020(2014) highlights the importance of collaboration between agriculture and health sectors, to increasethe knowledge base of local food producers in nutrition. The Plan calls for better food labelling and affordable pricing of fresh produce, in order to increase the interest of consumers in such products, leading to increased consumption. Enhanced access for Maltese products to retail,

[22] Cited in an interview with a relevant official, conducted by Dwyer et al (2014) during the preparation of the RDP, 2013

hospitality and catering outlets is also key. The Plan also highlights a key role for research and technology in the development of healthier fresh local produce through enhanced breeding and improved managementtechniques.

The National Research and Innovation Strategy 2020[23] identified Malta's Rural Development Programme as the instrument that should promote value-added and innovation in agriculture, in order to help offset the impact of the inherent constraints of the agricultural sector. Efforts pertaining to research and innovation will continue to be implemented in line with Malta's Smart Specialisation Strategy 2021-2027[24].

Meanwhile, the National Agricultural Policy[25] identifies the importance of research and innovation in the agricultural sector for the development and promotion of improved production methods that increase productivity and also for the development of new practices, processes and technologies that address new challenges faced by the agricultural sector. This requires both funding and the commitment of highly qualified staff. Farmers should also participate in this process by identifying relevant research topics and becoming involved in co-innovation, for example through the EIP Agri.

According to the National Agricultural Policy (2017), research and development in Malta, particularly in agriculture, is lacking since the benefits of research are not widely understood by economic operators.Apart from lacking a strong research culture in Malta, most businesses are small and do not generatefunding for research. This has led to the adaptation of international research findings to the local scenario, commonly when the process or technology of interest has already been on the market for along time. The persistence of key data gaps for the agri-food sector hinder the identification of whereresearch and development can bring the best returns. Most production and management decisions taken by the agricultural community are thus based on tradition and accumulated experience and often do not embrace external advice or new ideas which could generate long-term benefits[26].

The National Agricultural Policy identifies a number of sectors that could benefit from research and innovation, including:

- Rural tourism and the preservation of the rural environment;
- Identification of new plant varieties and livestock to better withstand the climate;
- Novel or niche sectors that may hold potential for exports and/or processing including snail farming, insect farming, aquaponics; and the production of bio-control agents for use in Integrated Pest Management.

The creation of a thriving knowledge-exchange, advice and innovation ecosystem for agri-food in Malta is needed. During the last programme, funding was able to establish two new relevant institutions, AGRIHUB and AGRICONNECT (Malta's farm advisory service), to help meet this key need.The National Agriculture Policy identifies a need to integrate information and communication technology more fully into the agricultural sector for the development of smart agricultural practices and precision farming. Current data indicate increasing uptake and deployment of water-saving

[23] National Research and Innovation Strategy 2020 (2014) https://mcst.gov.mt/wp-content/uploads/2017/02/National-RI-Strategy-2020-June-2014.pdf

[24] Ministry for Equality, Research and Innovation & The Malta Council for Science and Technology, 'Malta's Smart Specialisation Strategy 2021-2027', https://mcst.gov.mt/wp-content/uploads/2022/01/RIS3-Strategy-2020-2027.pdf.

[25] National Agricultural Policy for the Maltese Islands 2018 – 2028, Parliamentary Secretary for Agriculture, Fisheries and Animal Rights, https://agrikoltura.gov.mt/en/agricultural_directorate/Documents/nationalAgriculturalPolicy/napFinal.pdf

[26] National Agricultural Policy for the Maltese Islands 2018 – 2028 (2018) p.90 https://agrikoltura.gov.mt/en/agricultural_directorate/Documents/nationalAgriculturalPolicy/napFinal.pdf

irrigation technologies in the fruit and vegetable sector in Malta (see annex on SO5, for data). Through wider digital literacy in agronomic knowledge exchange, communication channels and information sharing can be improved while the efficient use of inputs and quality of farm management can be enhanced. Technology can be used by farmers to communicate with advice and extension services. Resources are needed to enable farmers to make use of such technology, given the excellent level of high-speed broadband accessibility in Malta's rural areas (see SO8), via necessary training and advice.

Malta's Agricultural Policy (2017) makes several points about the need to improve producer-consumer understanding concerning Maltese produce:

1. It cites a lack of recent surveys or detailed information about food consumer preferences and trends in Malta and calls for new research on this topic;
2. It affirms the value of investment to raise consumer awareness about Maltese products and their distinctive qualities; and
3. It calls for producers to work to enhance the quality and reliability of their offer to Maltese consumers, meeting consumer demand and national policy goals to enhance the health attributes of domestic produce.

In an effort to address some of these needs, the new Malta Food Agency was established in 2021.

Much of Maltese agricultural activity focuses on high-value primary outputs, including fruit and vegetables, wine and meats. However, the largest proportion of the farmland area is devoted to forage wheat, which is used for fodder but has been widely regarded as of poor nutritional quality.[27] In addition, especially for ruminant livestock, feeding too much a diet of grains is not good for their health and well-being.[28] These points are also developed in the Malta Agricultural Policy (2017) which notes that Malta's climate regime cannot sustain pastures and produce high quality fodder crops. More than half of Malta's UAA is dedicated to the cultivation of fodder, mostly wheat, and is almost exclusively dependent on rainfall that is becoming more and more erratic. The quality of soil also limits the quality of unirrigated cereals. More information about soil can be found in Specific Objective 5.

There is a need to continue in the amelioration of rural roads to improve accessibility to holdings with the aim of increasing utilization, improving farm management and increasing farm efficiency. As outlined in Malta's National Transport Master Plan[29], which presents evidence of the poor state of rural roads, the impact of climate change on the rural road network is identified as a threat. Road infrastructure remains necessary to increase competitiveness and accessibility, as well as mitigate risk from adverse weather conditions.

Strengths

As with Specific Objective 1, Malta's growing resident population and even larger visitor population offera significant opportunity for local producers to sell to local consumers. Many food products,

[27] Dwyer, J., Temple, M., Jones, J., Muscat, R., Cordina, G. and Vella, S. 2014. Towards a new agricultural policy for Malta: final report.CCRI/E-cubed consultants, for the Maltese Ministry of Agriculture.

[28] Diet and Disease In Cattle: High-Grain Feed May Promote Illness And Harmful Bacteria**,** American Association For The Advancement Of Science,
https://www.sciencedaily.com/releases/2001/05/010511074623.htm

however, are predominantly imported also due to the size of the local agricultural sector and other structural limitations that limit food sovereignty.

As an island nation and economy, Malta's farmers could benefit from focusing upon producing for the growing domestic market.

Proximity to markets enable freshness, authenticity, and reduced food miles, as well as better communication along short food supply chains, and potential for enhanced customer loyalty.

The small size of the islands and the sector itself enable the possibility of short food supply chains and the possibility for better communication.

The existing fresh food farmers' markets have gained popularity with consumers and provide farmers with an opportunity to sell direclty to consumers, eliminating the middleman and therefore increase their profit margins. However, their sectoral reach remains limited. The Maltese climate creates good conditions for 'unique' local products like low-water and high-sugar-content tomatoes for *kunserva*, and endemic varieties of olives and grape vines. Historically, certain other products successfully exploited niche export markets, such as early potatoes for the Dutch market, which depend upon specific supply-chain relationships and can be vulnerable to sudden market fluctuations. Other under-supplied and niche market opportunities could exist for Malta, if it had both adequate market intelligence and closely coordinated production and supply chains.

Some notable promotional links exist, for example between specific Maltese types or brands of food and popular Maltese chefs and restaurants, where locals and visitors eat while learning about the provenance and cultural significance of what they are eating.

Weaknesses

Lack of product traceability leads to a low level of supply chain integrity and weakens consumer confidence in buying local. It has also provided a disincentive for producers to take quality seriously, as a central element in their approach to farming.[30] A common complaint is that because the hotels and restaurants catering for the dominant tourist market in food have little or no interest in authentic Maltese produce, there are few benefits from developing higher quality products. [31]

In view of limited labelling, traceability and awareness, consumer confidence in buying local is limited.

Limited accessibility to farm holdings results in limited access to machinary and inefficiency in production, that may eventually result in land abandonment, reducing the production of fresh produce, thereby furhter limiting food security.

[30] Diet and Disease In Cattle: High-Grain Feed May Promote Illness And Harmful Bacteria, American Association For The Advancement Of Science,
https://www.sciencedaily.com/releases/2001/05/010511074623.htm

[31] Interviews with rabbit, sheep and goat, pigmeat and dairy producer representatives, 2020

Despite the successful establishment of farmers' markets that have brought farmers closer to consumers, producers affirm that there is a lack of good quality market research and other relevant up to date information and analysis to help them to be more customer focused.[32]

Some sectors, particularly fruit and vegetables, lack significant and coordinated representation and thus have little bargaining power in food chains, leaving producers vulnerable to potential unfair practices among middle-men, food processors and retailers. Fruit and vegetable producers using the central wholesale market in particular have described how this gives them little confidence that they can ensure a good return, for their product.[33]

The part-time and small-scale nature of most land-based farming in Malta means that relative incomes from agriculture are low.

As a consequence of this, farmers may be unwilling to invest in improved productivity and technologies that could make them more competitive.

Opportunities

Identified opportunities cluster strongly around the benefits of building stronger human and social capital and the capacity to better organise and develop, in the sector. Data on the low level of human capital is presented in the evidence for SO1 and that on social capital is explored under SO3. Areas of greatest potential include enhanced advice, learning and communications, business confidence and governance, and coordinated and strategic market and supply chain development, including research.

Coordination among producers in the main livestock sectors in Malta has been relatively strong, which provides scope to encourage increased focus upon product quality, market orientation, and adding value.

Upskilling farmers and investing in research is expected to result in enhanced sustainable production methods.

There is an opportunity for Maltese farmers to improve the marketing and branding of Maltese products by using EU and national quality labels, better address consumer needs and also increase the qulaity of production. More targeted market research and intelligence designed to help producers understand and better meet consumers' needs would help improve market orientation and market share for farmers. In the EU, today's consumers are asking for produce with higher environmental credentials such as lower use of pesticides and production that does not pollute water sources: this could be a challenge for current Maltese production methods, but also an opportunity to improve. Climate mitigation and adaptation measures, as well as sustainable production as mentioned in the EU's Green deal and Farm to Fork Strategies[34], offer opportunities to help re-orientate Malta's production systems along more sustainable lines.

[32] National Agricultural Policy for the Maltese Islands 2018 – 2028,Parliamentary Secretary for Agriculture, Fisheries and Animal Rights, https://agrikoltura.gov.mt/en/agricultural_directorate/Documents/nationalAgriculturalPolicy/napFinal.pd

[33] Dwyer et al, 2014 ibid.

[34] European Union, Farm to Fork strategy for sustainable food, 2019 https://ec.europa.eu/food/farm2fork_en

Experience of CAP funding to date suggests that demand for new knowledge and innovation among Malta's farmers is limited by their individual circumstances and the lack of collective or strategic institutions or organisations that could take such initiatives forward. This suggests that there are important opportunities to identify, foster and/or newly create initiatives or bodies who are dedicated to act on behalf of small and independent producers.

Another key aspect of improving competitiveness relates to ensuring that Malta's agriculture is climate-resilient, in view of existing and expected climate change impacts. Investing in more effective environmental management and water-conserving practices present an opportunity to promote this strategic objective – these actions will be addressed under SOs 4 and 5.

Increased processing of primary produce to create higher value outputs is also an area of potential enhanced competitiveness for some Maltese farmers. In pig meat, rabbit and poultry sectors, it may enable producers to strengthen their domestic market orientation and identity, enhancing their competitiveness against imported products.

Enhanced use of land to sustainably grow more suitable and higher quality fodder for livestock, especially dairy cattle, sheep and goats, could help to improve competitiveness in these sectors by improving animal health and welfare, reducing costs and enhancing the profitability of businesses able to access and purchase this kind of feed.

Threats

Climate change can be considered as an increasing threat for the competitiveness of the Maltese agricultural sector, in view of soil and coastal erosion, desertification, floods, drought and water scarcity.

Because agriculture is a relatively small sector for Malta in respect of its contribution to national GDP, it is possible that it receives a relatively minor share of attention in national research and development policy.

The continuing pressure upon rural land in Malta, arising from a growing population, a buoyant economy and significant tourism sector renders farming less attractive, in view of its limited profitability.

The latter may lead to reduced confidence among Maltese businesses to invest in primary production, on the basis that the land has much higher monetary value when usedfor other purposes.

If farm incomes do not increase sufficiently enough to provide suitable returns oninvestment, young people will seek employment elsewhere and food production in Malta will continueto decline.

Implications for needs and the case for intervention

The elements identified in the SWOT indicate areas of opportunity that can be developed through funding under the CAP Strategic Plan. The strategy should be to add value and to increase the

distinctive branding, qualities and market identity for Maltese farm products in the domestic market, among both residents and visitors. This can enhance the viability of various sectors in Maltese agriculture. However, the evidence, as discussed in SO1 and SO3, suggests that in order to achieve such development, building human and social capital and strengthening organisational capacity across the sector, will be essential.

Malta's Agricultural Strategy (2017) notes that EAFRD funding is required to improve presentation, labelling, branding and marketing through innovative methods. The more effective targeting of the tourism offer for food and drink products, as well as more direct sales to local consumers, can all be supported via appropriate EAFRD investment measures.

Uptake of many measures among Malta's farmers has been limited (Figure 2.4), however the investment measure (Measure 4) that provides funding for capital investments producers has been most successful. The measure supporting start up aid for young farmers (Measure 6.1) also registered significant uptake. However, the greater number of small and part-time producers in Malta, particularly in fresh fruit and vegetable sectors, has lacked the organisational capacity and impetus to tap into effective EAFRD resources. Also, the minimum Standard Output funding threshold has likely acted as a barrier to accessing investment aid among smaller businesses.

Figure 2.4 Selected information on Uptake of RDP measures, EIR 2019 (EMCS et al, 2020).

Focus Area 1A: As at end of 2019, no realised expenditure was recorded in any of the measures programmed under this FA.
Focus Area 1B: As at end of 2019, no realised expenditure was recorded under any of the relevant measures.
Focus Area 1C: As at end of 2019, no realised expenditure was recorded under the relevant measures.**Focus Area 2A**: Progress has been achieved in terms of the result target indicator on the % of agriculture holdings with RDP support for investment in restructuring or modernisation (R1/T4). The value as at end of 2019 amounted 65 holdings compared to a target value of 116 holdings to be attained by 2023.
Focus Area 2B: Good progress has been recorded for result target T5: % of agriculture holdings with RDP supported business development plan/investments for young farmers (Focus Area 2B) whereby with a progress value of 53 holdings linked to M6.1, the result target value, as at end of 2019 was 0.42% compared to a target value of 0.48% to be attained by 2023.
Focus Area 3A: By the end of 2019, the target on the % of agricultural holdings supported under qualityschemes, local markets and short supply circuits, and producer groups/organisations was nil. However, progress was registered on the number of operations supported under M4.2 (Programme Specific Target Indicator) contributing to FA3A with 15 operations selected in 2019 compared to a target of 25 to be attained by 2023.

There are therefore, significant opportunities to improve the design of relevant measures and capacity-building processes in order to increase the accessibility and attraction of CAP rural development funding to many in Malta's farming community. New or stronger intermediary organisations or public-private partnerships could be important vehicles for identifying and meeting smaller farmers' needs for training, advice and business development planning in a cost-effective and appropriately scaled way.

Under the 2014 - 2020 RDP, support through the cooperation measure enabled the setting up of several new partnership institutions promoting enhanced knowledge, skills and innovation in product

quality. Nevertheless, there is scope for more such activity and supporting forms of cooperation is still relevant to the local scenario.

Physical investment and investment in research and development will also be needed, to complement enhanced skills and business proficiency among farmers who opt to improve quality and add value to their products. Again, intermediary bodies acting on behalf of specific types or networks of producers with common goals, appear a critical ingredient in making such initiatives successful. Physical investments will build on state-aid schemes provided for farmers and producers, aimed at mitigating the impact of COVID-19 on the agricultural sector.

Marketing and promotion assistance can also be important as part of a strategic and collective approach by producers and processors. This can be tackled through cooperation, knowledge transfer as well as investment measures. More up to date market research, also working alongside Malta's policies to tackle obesity and encourage a healthy diet, as explained under Specific Objective 9, is also needed.

Among the dairy, pig and processed tomato sectors in Malta which are already well-organised via collective bodies or integrated supply chains (see SO3 for more details), there is scope for considering whole-sector strategic productivity enhancement programmes, to aid competitiveness, enhance market orientation and improve the sustainability of production methods simultaneously. A whole supply-chain programme for particular sectors could be devised to enable targeted and cost-effective investment to meet strategic needs, rather than relying upon individual farm-level applications to the EAFRD, which may have less ability to build the sector's longer-term resilience.

On-farm productive investments are expected to support the competitiveness of the sector, through the provision of grants aimed at supporting modernisation of holdings to improve their efficiency and profitability, Off-farm productive investments supporting the processing industry are expected to improve the added value of the sector.

The need for further investment in rural roads also remains, to provide better access to holdings. This will be tackled through the specific infrastructure intervention related to roads. Such investment will provide farmers with adequate access to their holdings, with the aim of reducing land abandonment and ensuring that farmers have adequate access to all parcels that form part of their holding.

Thus, the needs identified under this Specific Objective are as follows:

2.1 Build human, social and institutional capital through investment in knowledge, training, advice;

2.2 Better cooperation and strategic market approaches in the sectors which currently lack this;

2.3 Increase direct selling, adding value, improving processing, marketing facilities and skills.

2.4 Identify and support the investment needs of the sector to increase its market competitiveness

Specific Objective 3: Improve farmers' position in the value chain

Context and evidence

There are many agricultural co-operatives in Malta, with membership ranging from just a few farmersto more than 100. The largest membership is found among the livestock sector co-ops, with nation-wide pig and dairy co-ops each having more than 100 members, in 2020, and representing the vast majority of producers in these sectors.

The co-ops in the fruit and vegetable sectors are more numerous and largely organised by geography,covering farmer members in different groups of municipalities. Representing the fruit and vegetable sector, one central co-operative has the largest single share (26%) of all products sold through the central wholesale Pitkalija market, annually; and combines more than 100 farmer members from seven smaller primary co-ops. There are also cooperatives for specialist wine growers, for tomato growers, for potatoes for export, and one with a broader remit promoting rural action, generally.[35]

As outlined in the National Agricultural Policy (2018), the fruit and vegetable sector is fragmented withlimited producer bargaining power. Most co-operatives provide basic services to farmers, including the supply of products such as seeds, vaccines and other consumables, some representation with authorities, and training courses. Their organisational structure remains minimal and lacks professional resources, strategic direction and innovative approaches. There is an urgent need for upgrading the role and set-up of existing co-operatives and for further organisation, such as the development of inter-branch organisations, to co-ordinate better across the sector in line with presentneeds.

The value of total agricultural production in Malta at producer prices, in 2014, was €132.5 million Euros. Around 13,511 people are employed in the agriculture sector, but many more are employed in the wider food and drink sector[36]. Eighty percent of Malta's food and drink companies are Maltese- owned and managed; the industry predominantly consists of Maltese-owned companies. The majority of these companies are focused on the local market, with very limited export volumes.[37] According to the NSO (2022) 9,528 people worked in food manufacturing or food services in 2021[38].Compared to other manufacturing sectors across the EU, the food and drink industry is a key job provider and a relatively stable employer

Generally speaking, bargaining power asymmetries are prevalent in the food chain in Malta. Primary producers only participate in the supply chain to a limited extent, for example in processing, wholesale and direct sales, which can increase their market power. The table (Figure 3.1) gives an overview of the importance of different sectors, based on output value. Horticulture and dairy were the most important sectors in terms of production value in Malta in

[35] Koperattivi Malta, https://cooperatives-malta.coop/

[36] NSO, News Release, Census of Agriculture 2020, 1 February 2022 https://nso.gov.mt/en/News_Releases/Documents/2022/02/News2022_015.pdf

[37] Trade Malta, Food and Beverage Sector Insight (2016), https://www.trademalta.org/wp-content/uploads/2016/07/Food-and-Beverage-Sector-Insight.pdf

[38] NSO, New Release, Registered Employment: February 2022, https://nso.gov.mt/en/News_Releases/Documents/2022/07/News2022_126.pdf

2018,2019 and 2020, but the generally low overall percentage output of the total EU market is a notable feature of all sectors.[39] Price transmission along the chain is also asymmetric, due to these and other issues.[40] The share of value added of primary producers in the food chain has decreased over time in Malta, in favour of food and beverage consumer services (Figure 3.2). The share of value added that returns to agriculture is significantly lower in Malta (14.1% in 2016) than the EU-average (23.2% in 2016)[41], indicating a relatively weak bargaining power by primary producers.

Figure 3.1 Agricultural output, Malta (2021)

Agricultural output

Output components (real prices)	2018	2019	2020 (e)		
	Million EUR		Million EUR	% of total	% of EU27_2020
Cereals:		**0**	**0**	**0.0%**	**0.0%**
Wheat and spelt		0	0	0%	0.0%
Rye and meslin		0	0	0%	0.0%
Barley		0	0	0%	0.0%
Oats and summer cereal mixtures		0	0	0%	0.0%
Grain maize		0	0	0%	0.0%
Rice		0	0	0%	0.0%
Other cereals		0	0	0%	0.0%
Industrial crops:		**0**	**0**	**0.0%**	**0.0%**
Oil seeds and oleaginous fruits		0	0	0%	0.0%
Protein crops		0	0	0%	0.0%
Raw tobacco		0	0	0%	0.0%
Sugar beet		0	0	0%	0.0%
Other industrial crops		0	0	0%	0.0%
Forage plants	**4**	**3**	**3**	**3.2%**	**0.0%**
Vegetables and horticultural products	**25**	**28**	**27**	**28.0%**	**0.1%**
Potatoes	**4**	**4**	**3**	**3.5%**	**0.0%**
Fruits	**6**	**5**	**5**	**5.1%**	**0.0%**
Wine		**0**	**0**	**0%**	**0.0%**
Olive oil		**0**	**0**	**0%**	**0.0%**
Other crop products		**0**	**0**	**0%**	**0.0%**
Crop output	**38**	**40**	**39**	**39.9%**	**0.0%**
Animals:	**33**	**34**	**34**	**34.8%**	**0.0%**
Cattle	3	3	3	2.8%	0.0%
Pigs	8	8	8	8.3%	0.0%
Equines	0	0	0	0.0%	0.0%
Sheep and goats	0	0	0	0.4%	0.0%
Poultry	6	6	6	6.1%	0.0%
Other animals	16	17	17	17.2%	0.8%
Animal products:	**25**	**24**	**25**	**25.4%**	**0.0%**
Milk	17	17	17	17.8%	0.0%
Eggs	8	7	7	7.3%	0.1%
Other animal products	0	0	0	0.2%	0.0%
Animal output	**57**	**58**	**59**	**60.1%**	**0.0%**
Agricultural goods output	**95**	**98**	**98**	**100.0%**	**0.0%**

(e) 2020 data are estimates and may still change. Updated: June 2021

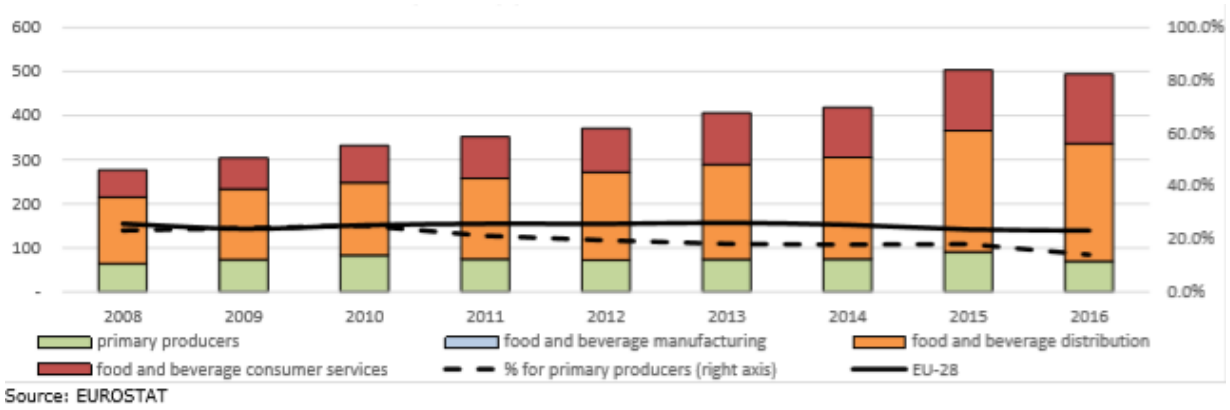
[39] EU Country Factsheets,2021, https://agriculture.ec.europa.eu/cap-my-country/performance-agricultural-policy/agriculture-country/eu-country-factsheets_en

[40] Key Policy Objectives of the Future CAP, https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/future-cap/key-policy-objectives-future-cap_en

[41] EC (2019) Analytical factsheet for Malta: Nine objectives for a future Common Agricultural Policy,https://agriculture.ec.europa.eu/cap-my-country/performance-agricultural-policy/agriculture-country/cap-specific-objectives-country_en

Source: EU Country Fact sheet: Statistical Factsheet for Malta 2019

Figure 3.2. Value Added of Maltese agricultural produce in the food chain (EUR m)



All the evidence indicates that because of their small scale, whether operating as individual producers,small family-oriented producer groups or small co-operatives, most of Malta's fruit and vegetable farmers are price-takers with relatively little influence upon markets.

Bringing together these groups into larger-scale collective organisations (e.g. establishing larger Producer Organisations or adopting an 'interbranch' approach), could help primary producers protecttheir interests, but there are barriers to overcome. These include lack of trust, insufficient knowledge of the potential benefits of such forms of co-operation, farmers perceiving other farmer groups as competitors, or wishing to have sole control of their individual production and investment decisions, for historical and/or cultural reasons. There are some examples of successful small-scale collaborationin Malta (e.g. in relation to shared irrigation systems), but these do not translate into supply chain collaborative action.

Increased awareness of the operation of supply chains and alternative forms of organisation would assist farmers and other stakeholders to develop new arrangements.

In recent years, the development of two farmers' markets in Malta has been a success story, shorteningthe supply chain and improving farmers' position within it, for a relatively small number of producers.Direct selling of produce from primary producer to final consumer is the shortest supply chain. The share of farms involved in direct selling in Malta is less than 5%, which is comparatively low for an EUMember State.[42] The National Agricultural Policy (2017) states that the farmers' market was set up to provide consumers with fresh seasonal produce at a more convenient price that avoids the commission paid to the Pitkalija middlemen. Farmers' markets also consolidate relationships betweenconsumers and producers, providing farmers with the possibility to adjust their supply according to consumers' needs.[43]

Although participation at the farmers market provides a number of advantages, many farmers

[42] Key Policy Objectives of the Future CAP, https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/future-cap/key-policy-objectives-future-cap_en

[43] National Agricultural Policy for the Maltese Islands 2018 – 2028, Parliamentary Secretary for Agriculture, Fisheries and Animal Rights(pg. 110), https://agrikoltura.gov.mt/en/agricultural_directorate/Documents/nationalAgriculturalPolicy/napFinal.pdf

do nothave adequate human resources to cultivate the land while also hosting a retail stall; this would require either additional salespersons to sell produce or farmhands to cultivate fields. Engaging such additional personnel might not make economic sense for small, part-time farms.[44] Farmers participating in farmers markets are generally family-run farming units; some face challenges to cope with the demand generated at the market, because of their time constraints.[45]

A more coordinated approach between groups of farmers to their crop choices and market outlets could maximise the returns of each farmer and improve efficiency in resource use and time management. The formation of cropping clusters would allow each farmer to specialise in a smaller variety of crops, creating a joint approach to the production of fresh produce with other farmers in their cluster. However, to date, no such initiatives have been established successfully.[46]

As regards governance and farmers' position in the value chain for the rabbit and poultry sectors in Malta, the situation is varied. Rabbit meat is a distinctive market in Malta, and Malta has the highest per-capita consumption of rabbit meat in the EU, with an average annual consumption of 3 kilos of rabbit per person (DG Health and Food Safety, 2017).[47] This market is a much less significant sector in most other EU Member States. Rearing of rabbits is considered mainly as a cottage industry that has taken place in Malta for decades, with many small rabbit farms directly supplying butcher shops and restaurants. A few enterprises have also been established in recent years, where much larger, modern farms deliver a more substantial output. The opportunities to attract young people into the sector are limited by low returns and a lack of investment funding to enable set-ups, although two larger businesses were established with support from the EAFRD young farmer installation measure, in the programming period 2014-2020.

The National Agricultural Policy notes that rabbit breeders have a competitive disadvantage, given that feed is imported at high costs and therefore locally produced rabbit cannot compete with imported meat solely on price. Retailers and restaurants may not necessarily be interested in the provenance of the product they are selling and may therefore resort to purchasing imported meat, if this increases their profit margins. Local breeders have lost a considerable share of their market since import barriers were reduced on EU accession. Traceability issues need to be addressed, especially to increase consumer trust, but there is little confidence in co-operation between producers to help address these issues, at present.[48]

A similar set of challenges also affects the poultry meat sector in Malta, where just four processors slaughter Maltese chicken compared to nine, a decade ago. However, during the recent COVID 19 lockdown, one processor saw demand increase via online direct sales to Maltese consumers seeking a fresh and authentic Maltese product.[49]

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[44] Ibid.
[45] Ibid.
[46] Ibid.
[47] DG Health and Food Safety,2017, Overview report Commercial Rabbit Farming in the European Union, https://ec.europa.eu/food/audits-analysis/overview_reports/act_getPDF.cfm?PDF_ID=1193
[48] Interview with rabbit sector representative, May 2020.
[49] Interview with poultry processor, July 2020.

Vineyards and wine producers face competition from wines imported from other EU and international producers, and the relative bargaining power of domestic vine growers is low, also due to limited co-operation in the sector. Malta's largest wineries have no land of their own and buy grapes from a large number of very small producers dispersed across the islands, as well as making wine from imported grapes. Viticulture is therefore a sector that could benefit from more co-operation and better strategic planning but is hindered by low levels of trust between producers and processors. A number of dry winters have negatively impacted the health of vines, with many having to be uprooted. This has led to vine scarcity, as noted in the National Agriculture Policy, and in view of this a vine replanting effort is required so as to respond to demand for Maltese wines among Maltese consumers and tourists.

In recent years, both established and some small wineries started investing in the production of estate wines. Small 'boutique' wineries have an interest to produce limited volumes of wine that are of exceptional quality, produced from grapes cultivated in their own vineyards using strict quality parameters In such ventures, wineries have full control over the cultivation process up to the finished wine product. This trend reflects the need to focus on quality wines, in view of the micro-farming nature of vineyards in Malta. Estate wineries produce wines based on a limited yield per hectare so that the production is controlled, and grapes can achieve the required quality parameters.[50]

Most Maltese olive oil production is undertaken by recreational farmers on very small parts of their land. Olive pressing starts after the maturation period, with most olive oil producers pressing their olives at one of the registered presses, producing oil for their own consumption. Olive oil production was recently regulated through LN 66 of 2014 that is directed mainly at olive oil presses with the aim of controlling the modus operandi for commercial olive oil production in Malta and its placement on the market. Larger operators generally operate their own olive presses and supply a considerable amount of olive oil to the local market and for export. (Malta Agricultural Policy, 2017).

Both olive and sheep and goat sectors have a relatively undeveloped market position with production currently under ad-hoc arrangements and not generally well-coordinated. Goats and sheep in Malta are primarily reared for milking, and very often farmed together.

The total goat population in the Maltese Islands in 2020 amounted to 5,764 head. The largest concentration of goats is found in Gozo with 1,424 of the population, followed by the South-eastern district at 1,415 and the Western district with 992[51]. A large percentage of goats bred in Malta (43%) are held on small farms with fewer than 10 heads. The number of farms with a herd size between 10 and 49 goats represent 36% of the population in Malta and 15% in Gozo. 23% of goats in the Maltese Islands are bred on farms with herd sizes larger than 50.[52]

[50] National Agricultural Policy for Malta 2028-2028, p.47 Parliamentary Secretary for Agriculture, Fisheries and Animal Rights, https://agrikoltura.gov.mt/en/agricultural_directorate/Documents/nationalAgriculturalPolicy/napFinal.pdf

[51] NSO, News Release, Census of Agriculture 2020, 1 February 2022 https://nso.gov.mt/en/News_Releases/Documents/2022/02/News2022_015.pdf

[52] National Agricultural Policy for the Maltese Islands 2018 – 2028 (pg. 111), Parliamentary Secretary for Agriculture, Fisheries and Animal Rights, https://agrikoltura.gov.mt/en/agricultural_directorate/Documents/nationalAgriculturalPolicy/napFinal.pdf

In respect of sheep, total population in the Maltese Islands in 2020 amounted to 16,177 heads. The largest concentration of sheep is found in Gozo with 4,882 of the population, followed by the South-eastern district at 3,469 and the Western district with 3,713. The number of farms with a flock size between 10 and 49 sheep represents 46% of the sheep population in Malta and 42% in Gozo. 22% of sheep in the Maltese Islands are in flock sizes greater than 50 heads.[53]

Sheep and goats' milk is used mainly for the production of traditional cheeselets, known as *ġbejna* or *ġbejniet* that are sold fresh on the same day of production. Dried, pickled cheeselets, whether plain or seasoned, are also popular and have a longer shelf life than fresh ones.[54]

Vertical integration is quite common between producers and cheese processing and much cheese is produced by the farmers themselves, as noted by Attard et al, 2018 [55], but links to retail and hospitality sectors are less well-established: marketing is often informal and by word of mouth. There was an initiative in 2013 by producers in the sector to seek a PDO designation for their cheeselets and a detailed case was assembled, however, no further progress has been registered to date.

Many producers in the sector continue to use premises which are in need of improvement for, but there is a lack of access to small-scale capital with which to invest. Another problem faced by the sector is a lack of grazing opportunity; Malta has no pastureland and its semi-natural vegetation is largely designated as non-agricultural and protected due to its high biodiversity value, meaning that graziers must instead purchase feed for their stock and keep them indoors. All these factors currently limit the opportunities for sector expansion despite the distinctive and valued attributes of its main cheese products. An organisation representing the sector has been formed in recent years and is keen to build a stronger strategic approach, for the future[56]

Honey is a production sector with some evidence of producer co-operation and developing market visibility and strength, particularly in respect of tourism. According to the Malta Agricultural Policy (2017), the demand for honey is larger than the current supply, and beekeeping also supports pollination to Malta's unique flora. These factors suggest that action to strengthen the market position of Maltese honey would bring benefits.[57]

In summary, in relation to this Specific Objective, the National Agricultural Policy makes reference to a number of issues, all indicative of poorly developed supply chain co-ordination, with implications for producer bargaining power. These indicate a need to consider the basic building blocks for enhanced co-operation and governance structures, which must begin with human and social capital development and capacity-building.

Experience from the previous period of the Rural Development Programme (RDP AIR 2018, MEAE) has demonstrated that simply promoting further co-operation through direct funding is difficult to accomplish unless farmers, farm families and small co-operatives are given the

[53] Ibid.
[54] Ibid.
[55] Attard, E., Grupetta, A. and Carpino, S. (2018). Cheeses from Malta, in Papademos and Bintsis, eds. Global Cheesemaking Technology: Cheese Quality and Characteristics. Wiley and sons, Chichester.
[56] Interview with sheep and goat sector representative, June 2020.
[57] National Agriculture Policy for Malta, 2018 – 2028 (2017), https://agrikoltura.gov.mt/en/agricultural_directorate/Documents/nationalAgriculturalPolicy/napFinal.pdf.

information, skills and confidence to engage in such activities, as well as an enhanced awareness of the financial and other benefits that could ensue from a stronger engagement in collaborative supply chain actions. New institutional and multi-actor initiatives may be needed in order to provide such impetus for change. As mentioned also in SO2, the recent applications for funding under Malta's RDP for the co-operation measure give some evidence to demonstrate that certain groups of farmers, farm organisations, government institutions and researchers have identified the potential benefit of joining together in collective action to seek to address various strategic challenges.

Strengths

Even though cooperation remains limited and there is much room for improvement, there is increased awareness among farmers of the need to better organise themselves into larger collective groups and bodies, in order to seek enhanced returns, particularly among younger farmers

With a population that exceeds half a million consumers within relatively easy reach, farm production is well-placed to specialise in fresh, high-quality products to support a varied and healthy diet.

Maltese products include some with a strong brand image, such as the Maltese *gbejna*, *kunserva*, honey, and wine, some of which have specific rules governing product ingredients, methods of manufacture and/or other local specialty features which help to maintain a distinctive market offer. The volume of these products is low in comparison to the potential market within Malta and for export, meaning little risk of market saturation.

With a diverse range of quality Maltese products that matches demand and that is already known to many consumers, farmers havethe advantage of freshness and proximity to domestic markets.

Weaknesses

A general weakness applying to several sectors is a lack of control on the quality and origin of imports;with a propensity of processors and retailers to use or sell imported products as local produce, as noted in the Malta Agricultural Policy. This pattern is linked to lack of transparency and traceability in the sale and marketing of fresh produce, in Malta. Poor traceability, inconsistent quality and supply as well as profiteering are significant issues for all fresh produce sectors, and for some farm inputs, with significant scope for supply chain improvements.

Existing supply chain arrangements can be a barrier to increasing producer influence over the prices that they receive and the conditions under which they work. A more open dialogue concerning the issues and uncertainties in marketing routes and conditions for fruit and vegetables, wine and small livestock products and sectors is needed, to overcome this weakness. Inter-sectoral competition may also be holding back beneficial developments in some sectors, such as a stronger quality mark and recognition for the traditional Maltese sheep

and goats' milk cheeselets; which should be addressed.

Limited cooperation is the result of numerous barriers, including lack of trust, insufficient knowledgeof the potential benefits of co-operation, farmers perceiving other farmer groups as competitors, or wishing to control their individual production and investment decisions, for historical or cultural reasons.

Opportunities

There is an opportunity to attract part of the large tourist population that visits Malta on an annual basis. Given the proximity of urban to rural areas, tourists can visit rural areas without having to travel for long periods of time. There is therfore room for growth in this regard.

Expanding the number of quality schemes and promoting the benefits of choosing seasonal local produce can also provide farmers with the necessary exposure to increasing number of consumers that may be willing to purchase local produce, even at a premium price.

More significant cooperation between farmer groups (Producer Organisations and co-operatives), and in the framework of the farmers' market, could enhance the strategic organisation of producers and the way in which they manage their products. For example, it would be possible for individual producers to come together in clusters which each focus on a small variety of crops in a coordinatedway, through for example, the setting up of Operational Groups, which would lead to better economies of scale and more efficiency.

The impact of COVID-19 and the conflict in Ukraine have brought about severe disruptions to the supply chain, together with higher cost of inputs. This has highlighted the importance and desire for shorter and more secure supply chains.

The setting up of the Malta Food Agency aims to to tackle market failures in the Maltese agri-food system and increase value of locally produced food, by supporting and strengthening the transformation of food along the value chain.

Threats

Strength of wholesaler middlemen in insufficiently transparent trading market conditions results in farmers receiving limited return for their produce, eroding their profit margins.

Limited skills and time are barriers to engaging in direct sales and there is potential discrimination against those who engage in alternative marketing by larger players

Limited traceability leading to imported goods being sold as local produce, which reduces consumer trust.

Increasing costs of imported inputs, including feed for livestock and fertilisers and pesticides further impacts the profitability of the farming sector, rendering local produce less competitive compared to imported produce from countries that can benefit from economies of scale.

Implications for needs and the case for intervention

The SWOT highlights the urgent need to enhance farmers' position in most Maltese supply chains through an increased strategic emphasis upon Maltese Quality Products and specific branding and market development. However, there is a need to consider the relative state of development of theseoptions in each sector, in order to prioritise actions for the 2021-2027 period that can best lay the foundations for positive developments in the medium to longer term. Different strategies are likely tobe optimal for different agricultural sectors, and each must be tailored to the specificities of the challenges faced and resources available, in each sector. The CAP Strategic Plan is therefore expected to support farmers subscribed to such quality schemes by financing the expenditure incurred for certification or part thereof, while information interventions targeted towards both farmers and the general public are also eligible for support.

More generally, there is an important need to raise consumer and buyer awareness of the value and wider societal benefits of home-grown agricultural produce that is produced in sustainable ways and to a high-quality specification. Information campaigns on the importance of supporting the local sector and seasonal produce have been shown as potentially valuable through recent NGO activities [58].These can help to increase demand for Maltese produce which will in turn increase the bargaining power of Maltese farmers *vis a vis* competitors from other countries. The new Malta Food Agency should be key, in pursuing these goals by helping producers improve quality and helping consumers to identify and support quality local produce.

The provisions under the CAP can be used to help farmers in Malta to co-operate and to seek better market niches for their products, emphasising quality over quantity. Opportunities for development can be found in investments to strengthen Malta's Agricultural Knowledge and Innovation System (AKIS), that could increase farmers' bargaining power through acquired knowledge and enhancementof traditional working methods. In order to stregthen knowledge exchange, support is being offered through EAFRD interventions, knowledge exchange, training and dissemination of information, that will aim to raise the level of skills and knowledge of farmers and operators in the agricultural sector.

Fostering enhanced strategic-level co-operation in fruit and vegetable sectors may require new partnerships between farm families, existing small co-ops, appropriate advisory or KE brokers and those with research and innovation skills as well as market research capability, to provide a strong enough grouping of actors to achieve increased bargaining power in the supply chain. These partnerships are unlikely to happen quickly or without some kind of independent facilitation or incentive to bring people together in this way. The role of government agencies and local governanceand enterprise structures, including Local Action Groups, could be very important, in this regard.

Rural development measures including aid for processing and marketing through the off-farm productive investments intervention and support for promotion and adding value can be

[58] Friends of the Earth, Food, Agriculture and biodiversity. https://foemalta.org/our-campaigns/food-agriculture-biodiversity/

utilised in pursuit of these ends, so long as producers themselves recognise the gains to be made from these activities. Evidence from previous evaluations at EU level suggest that offering such aid in strategic packages, linked to multi-actor plans drawn up at sector level and, where possible, delivered via trusted intermediaries (co-operatives or sector representative bodies, perhaps working in partnership with advisory or training providers), can ensure that funding reaches those with the greatest need and potential for benefit. Physical investments will build on state-aid schemes provided for farmers and producers, aimed at mitigating the impact of COVID-19 on the agricultural sector. Since Cooperation was identified in the SWOT and needs analysis as a key requirement for further development of the sector, support will be offered through EAFRD interventions through EIP cooperation activities that will encourage and promote cooperation along the supply chain between farmers, young farmers, and public entities amongst others which may develop a better link between producer and consumer.

Where awareness of such opportunities is low, support for advice, capacity-building and/or training to help raise awareness can be an important first step to increasing farmers' bargaining power in value chains. Actions in which government-sponsored actors and agencies such as AGRIHUB and AGRICONNECT can take the role of enabler, working closely with sector representatives and potential innovators to stimulate new collective action, are likely to be important in all those sectors where current levels of trust and organisation are quite low – e.g. sheep and goats, vines, fruit and vegetables, olives.

Thus the needs for this SO are:

3.1 Build human and social capital and support facilitation and innovation to improve the bargaining position of farmers in supply chain

3.2 Improve the organisation of producers in the relevant sectors, where this is currently lacking

3.3 Promote Product Quality National Scheme (PQNS) and branding to influence consumer choice

3.4 Further develop established niche markets for authentic Maltese products

3.5 Support investments that shorten the supply chain.

<u>Specific Objective 4: Contribute to climate change mitigation and adaptation, including</u>

by reducing greenhouse gas emissions and enhancing carbon sequestration, as well as to promote sustainable energy

Context and evidence

The energy sector is the highest overall contributor to greenhouse gas emissions in Malta, by a significant margin over other sectors. The energy sector is strongly influenced by emissions from the two main category contributors, energy generation and transport – see Figure 4.1 (Malta NIR, 2019). By contrast, total emissions from agriculture are comparatively modest and have not increased in share, in the last 30 years – indeed the NIR reports a 15% decline from 76.6 to 65.1 Gg CO2 eq. between 1990 and 2017. With regards to energy consumption by the agricultural sector, this can be considered as quite low, with only 0.9% of total energy use in Malta used in agriculture. This is one of the lowest shares of all EU Member States and is also well below the EU average of 3.3%.[59] Also important and unusual is Malta's almost nil contribution to emissions from LULUCF, reflecting its lack of forests and relatively stable patterns of land use over the period.

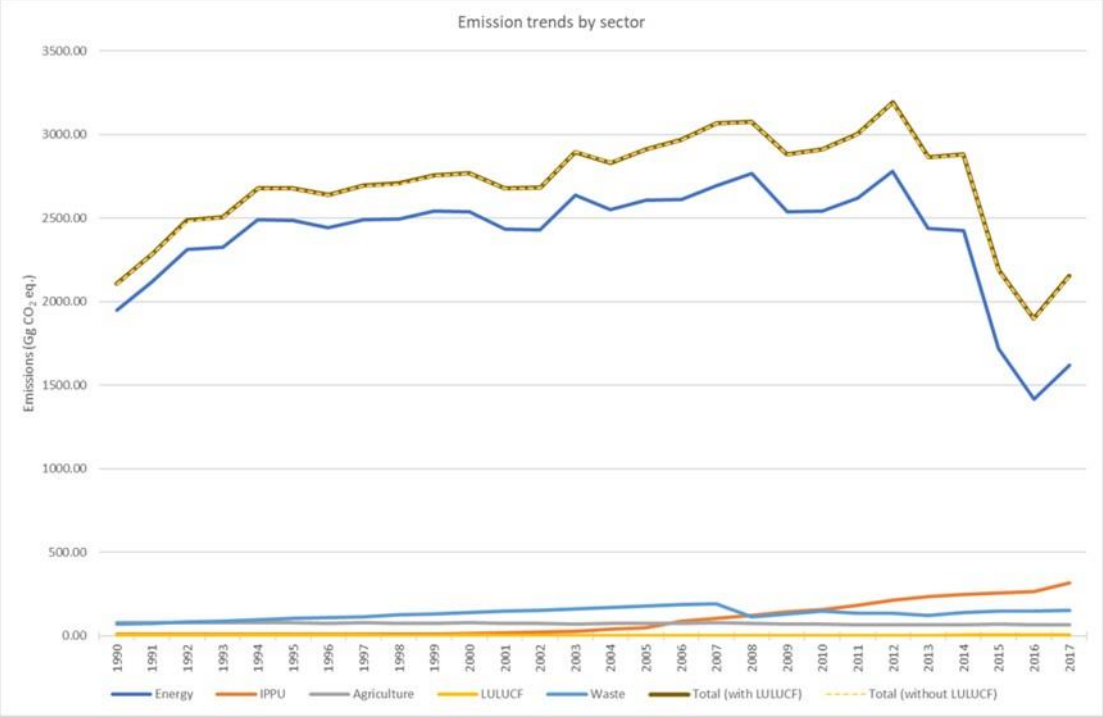
During 2020, the electricity supply in Malta comprised of: net generation from power plants (73.6%), supply from net imports (16.7%) and renewable sources (9.7%). Energy harvesting from renewable sources registered an increase of 20.5%, reaching 233.1 GWh in 2020. Most of the renewable energy (97.5%) was produced from PVs. During 2020, a total of 419.8 GWh were imported through the interconnector. In 2020, GHG emissions from fuel combustion in power plants increased by 9.6% over 2019[60]. Malta's GHG emissions show a decrease since 2012, resulting from significant transitions to low carbon which Government has recently undertaken.

Malta's potential for further RE deployment is affected by physical and spatial limitations, technological advancement, and resource potential, with resource availability and cost of land being predominant barriers. As noted in the Malta's Low Carbon Development Strategy the main expected increase in RE from 2021 to 2030 relates to PVs and solar water heaters which are expected to reach maximum capacity by 2030 due to local roof space limitations. Limitations related to economies of scale and energy storage capacity also hinder the increase in RES uptake while posing restrictions in relation to offshore energy generation. Government has over the years incentivised the use RE across households, industry and public buildings and spaces. Various nationally funded schemes are in place to support such investments by households and private operators. As outlined in the Court of Auditors Report[61], there is limited added value in EU grants for RES as project owners could implement their projects without grants, also in view of the advantageous feed-in tariff. Nevertheless, in line with the NECP 2030,[62] Malta's Smart Specialisation Strategy 2021-2027, the National Strategy for Research and Innovation in Energy and Water (2021-2030), and Malta's Low Carbon

[59] Eurostat (2021), Share of energy consumption by agriculture in final energy consumption, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Table1_Share_of_energy_consumption_by_agriculture_in_final_energy_consumption_EU_1999_2009_2019.png
[60] NSO (2021), Electricity Supply: 2016-2020. https://nso.gov.mt/en/News_Releases/Documents/2021/10/News2021_181.pdf
[61] Court of Auditors, 'Preliminary findings of the audit of ERDF and Cohesion Fund investments in the field of renewable energy – Operational Programme I – Investing in Competitiveness for a Better Quality of Life, Malta' (2013)
[62] Malta's National Energy and Climate Plan 2030, December 2019

Development Strategy,[63] the objectives identified in the European Green Deal and the REPower EU Initiative, ERDF resources will explore pilot RES initiatives with a view to pave the way for a new generation of RE.

Figure 4.1 GHG emissions, Malta, by source (NIR 2019)

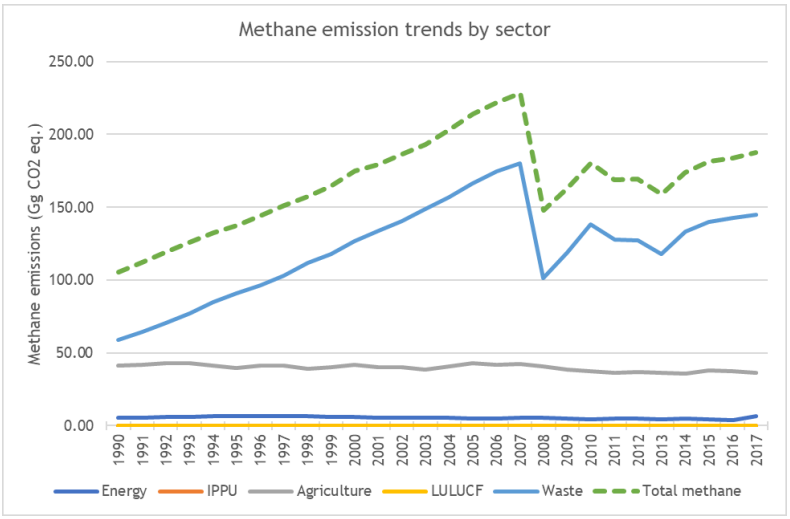


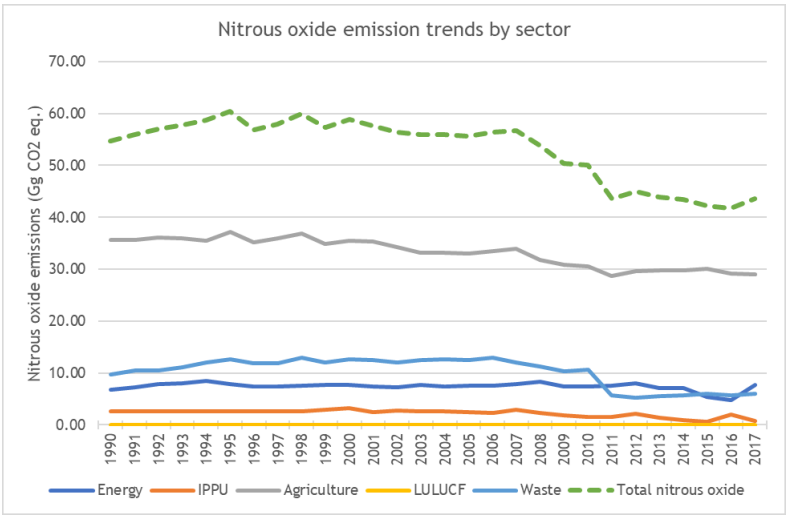
Agriculture contributes to GHG emissions largely in the forms of methane and N20 from manures andfertilisers, respectively, but whereas agriculture is a minor contributor to methane emissions, it is themajor source of emissions of nitrous oxides, in Malta (NIR, 2019) – see Figures 4.2. and 4.3. Methane emissions result from enteric fermentation of ruminants such as cattle, sheep and goats and also frommanure decomposition, that also produces nitrous oxide emissions. Additionally, soil nitrification anddenitrification produce nitrous oxide emissions, and the manufacture and application of nitrogenous fertilizer releases significant amounts of carbon dioxide and nitrous oxides into the atmosphere. The agriculture sector accounts for a very small share of national GHG emissions (3%), with methane being the main contributor due to enteric fermentation and manure management. However, the agricultural sector fares better than other sectors in Malta, with transport sector contributing to 21.1% of GHG emissions.[64]

[63] Malta Low Carbon Development Strategy, October 2021

[64] Ministry for the Environment, Climate Change and Planning (2021), Malta Low Carbon Development Strategy, https://unfccc.int/sites/default/files/resource/MLT_LTS_Nov2021.pdf

Figures 4.2 and 4.3 – Methane and Nitrous Oxide emissions by sector, Malta (NIR 2019)





Looking at the composition of emissions from agriculture, the three largest sources are enteric fermentation, manure management and managed soils, respectively. Energy use in agriculture is not large enough to figure on the graph (Figure 4.4). Managed soils refers to cropped areas on which nitrogen fertilisers and manures from poultry, rabbits and sheep and goats are applied. Manures from pigs and dairy cattle are mainly stored as slurry, then collected and disposed of as waste through Malta's central waste treatment facilities.

Malta has one of the strictest regulations on animal manure where livestock are required to be kept under a roof and that adequate manure management systems are in place as to ensure that no leaching of nutrients generated from this activity is leached to the aquifer (SL 549.66). Furthermore, the liquid portion of the manure is stored in a leakproof cesspit which is emptied by a service provider who takes the generated waste to waste treatment facilities. It is also to be noted that the application of slurry is not permissible under this local regulation thus, as a result, eliminating any risks of increased ammonia emissions associated with this activity.

Malta is facing infringement procedures concerning urban waste (Infringement No, 2016/2142) that have been raised in 2016. One of the reasons of non-compliance is due to an excess of farm manure discharges in collecting wastewater systems. In August 2022, the Maltese authorities notified the Commission Services that it will be working towards a complete disconnection of farm waste from the sewage network through concrete measures that are aimed at achieving full compliance with the Urban Wastewater Treatment Directive by end of 2026. This will be achieved through the development of three slurry treatment facilities, two in Malta and one in Gozo, that will process farm slurry separating it into a solid fraction and a liquid fraction. The solid fraction will undergo compaction following any necessary treatment to be used as a soil enhancer or processed into other products, whereas the liquid fraction will be treated in line with Directive 91/27/EEC concerning urban wastewater treatment or Regulation (EU) 2020/741 on minimum requirements for water reuse.

This process shall comprise of four main steps:

A. Slurry collection and handling;
B. Separation of solids/ liquids;
C. Solids drying/pelletizing for soil enhancer/fertiliser; and
D. Biological treatment of the liquid fraction derived from stage B followed by ultrafiltration in line with Regulation 2020/741 or Directive 91/271/EC and/or disinfection depending on the fate of the reclaimed water produced.

Pending the setting up of these treatment facilities temporary solutions paving the way to compliance with the Directive 91/27/EEC in the short-term will also be implemented. Farm waste in Malta will be diverted to the dewatering facility set up at the South Urban Wastewater Treatment Plant. The solid fraction resulting from the dewatering process will be processed in a Processing and Granulation Centre that is planned to start operating by December 2022. Such processing will ensure storage and management of the solid fraction in compliance with the Nitrates Action Programme Regulations (Subsidiary Legislation 549.66).

These projects will therefore not only target water related issues but also emission related ones, given that the process outlined above better ensures the correct handling of slurry and manures.

Among all sources of greenhouse gas emissions, only the manufacture of N-fertilizer, energy and fuelconsumption and the clearance of permanent vegetation involve the release of GHG from long-term reserves; other sources come from current cycles (such that they release only what is locked up withinplants within a short timeframe).[65] However, the share of agriculture in Malta's total net emissions iscomparatively low, and ammonia emissions negligible, when

[65] Archive: Agriculture - greenhouse gas emission statistics: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Archive:Agriculture_-_greenhouse_gas_emission_statistics&direction=next&oldid=326686 (accessed 9th April 2020)

compared to the EU-28[66], even though the intensity of emissions per hectare is comparatively high (Figure 4.5). This reflects the predominance of intensive forms of production (e.g. horticulture, dairy) but the still marginal nature of agriculture asa sector within the Maltese economy.

The NIR reports that 'the rate of Nitrogen fertilizer application to Maltese fields is not available.

However, a new methodology has been drawn up to estimate the fertilizer application rates, which is based on consumption and application data, but dependent on the yearly variation in the UAA. Efforts keep being made to improve the data and to get access to country-specific values for more accurate reporting, particularly data on animal numbers, animal characterisation, animal waste management systems, fertiliser use, cropping systems and agricultural land area (Malta NIR, 2019).

Figure 4.4 Emission trends for Agriculture – total and by category (NIR, 2019)

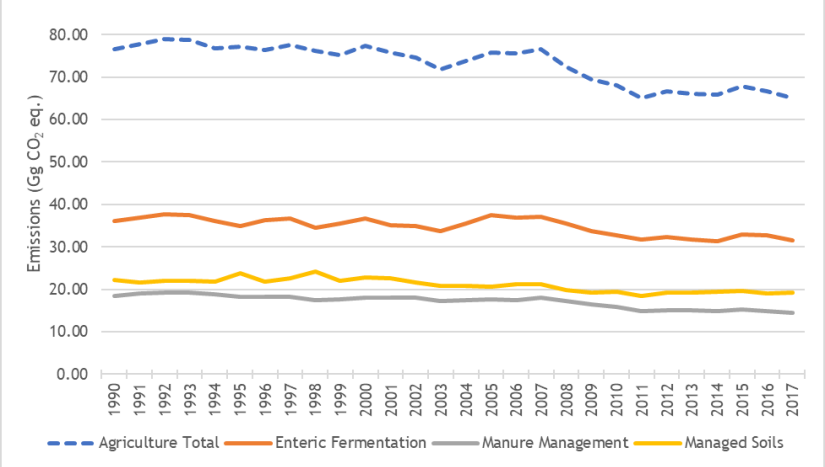


Table 4.1 estimated Nitrogen application to Maltese farm fields, trends over time (NIR, 2019)

Parameter	Unit	1990	1995	2000	2005	2010	2015	2016	2017
N application Rate	kg N/ha	36.31	80.82	80.43	57.63	48.19	46.78	49.06	49.08
Annual amount of synthetic fertilizer N applied to soils	kg N yr-1	466143	780228	714983	590892	551925	617749	568151	585487
Annual amount of animal manure N applied to soils	kg N yr-1	2081353	2047544	2018552	1916202	1715073	1646161	1575478	1566117
Annual amount of N in crop residue returned to soils	kg N yr-1	878182	803181	813758	722806	773171	787398	826428	816872
Annual amount of N mineralization associated with loss of soil	kg N yr-1	67758	29146	25831	18672	39092	57309	*60935*	64560

Source: EEA

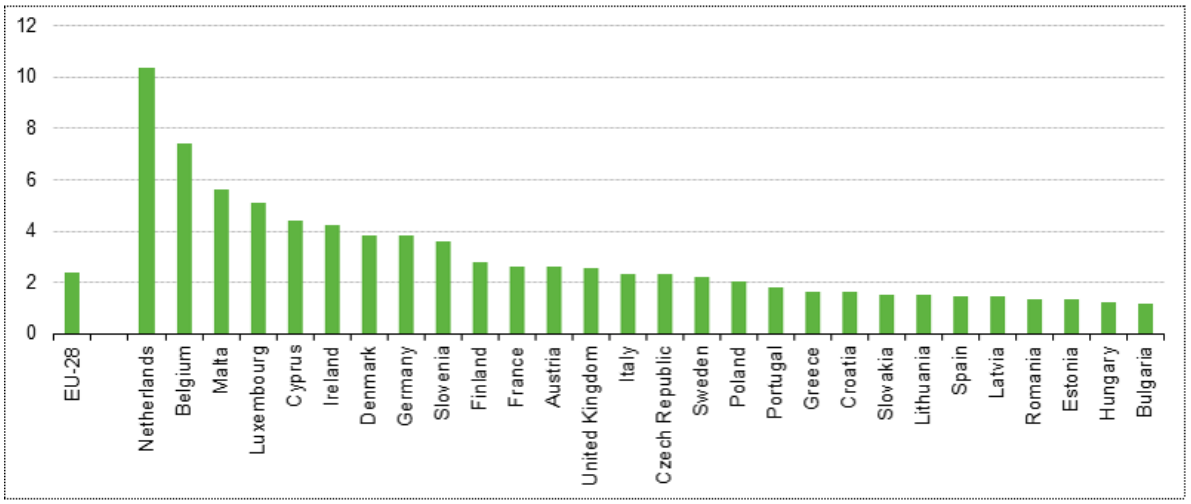
Agriculture is more vulnerable to climate change than most other sectors of the economy

[66] EC (2019) Analytical factsheet for Malta: Nine objectives for a future Common Agricultural Policy, p.9: Analytical factsheet for Malta:Nine objectives for a future Common Agricultural Policy.

since itaffects both the natural cycles of crop growth and the physical infrastructure required to supportagriculture.

Figure 4.5 Aggregate emissions of CH4 and N2O per hectare of UAA

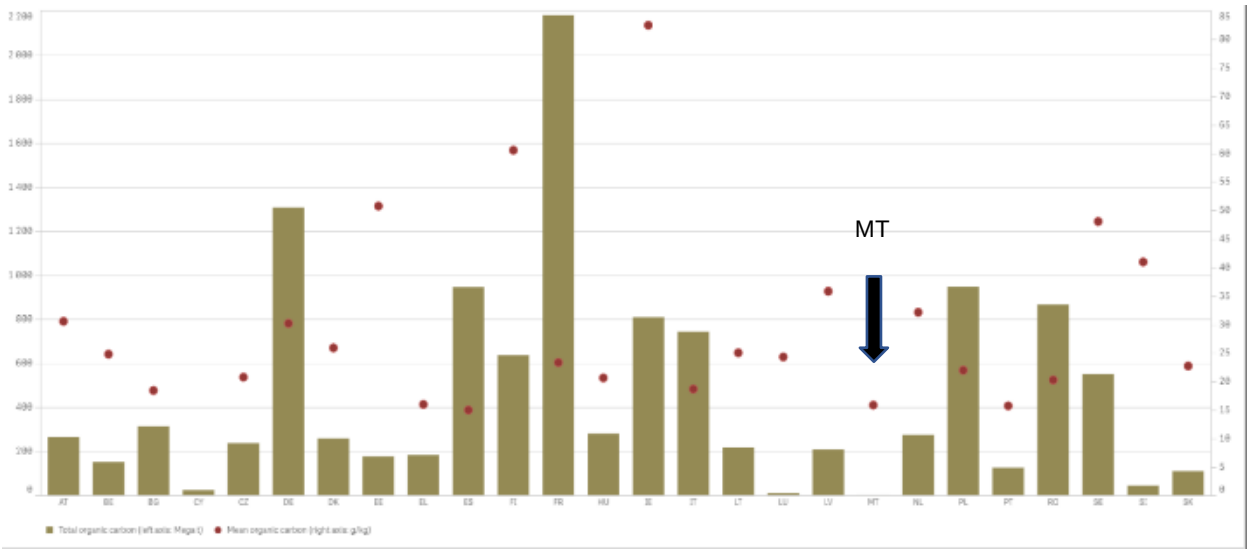
(kilotonnes CO2 equivalent per ‘000 hectares), 2015



Source: Eurostat

Agriculture has limited but important potential to contribute to climate change mitigation by removing greenhouse gases from the atmosphere through plant growth and good soil management. Soil organicmatter (SOM) is a vital carbon store which can be increased with appropriate agricultural management; and permanent crops and tree cover in farmed landscapes also help to act as carbon stores or sinks. Current data on C-content in Maltese soils suggests scope for improvement. As reported in SO6, the ESDAC database estimates topsoil organic matter content for Malta of less than0.1 peta-grams in total, or well below 1%. However, empirical surveys in recent years suggest higher figures: The average soil organic carbon content for sample sites across Malta that were assessed in both 2003 and 2013 (70 sites in total) was 2.11% for 2003 and 2.30% for 2013. 59% of locations assessed in 2013 had higher organic carbon content than the same locations in 2003. The Rural Development Programmes for Malta 2007-2013 and 2014-2020 supported a number of measures to combat soil degradation and reverse decline of organic matter. The SoER 2018 suggests that ‘the observed increase in soil organic matter may in part be the result of such initiatives.’

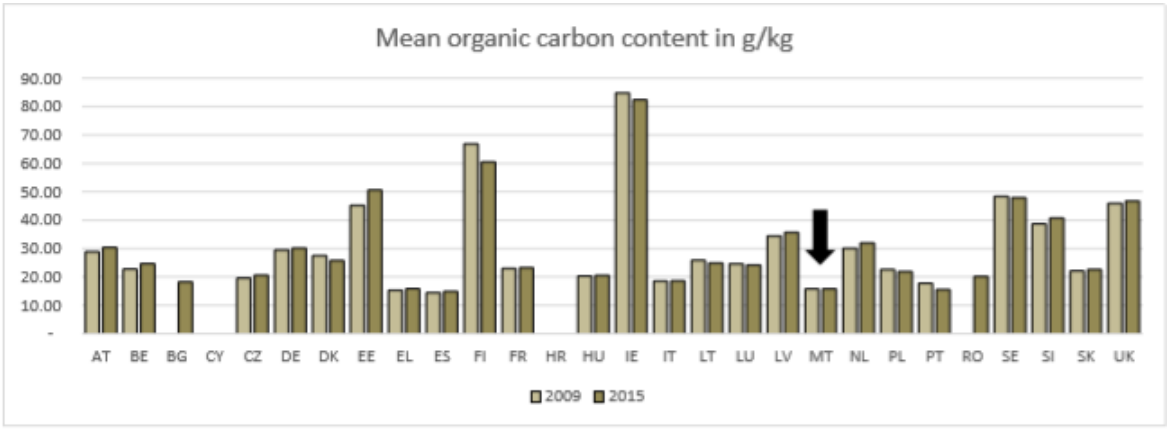
Figure 4.3 Soil Organic Matter in arable land (Mega t & g/kg)



Source: CAP Indicators Soil Quality - (EU27) - European Union 27 (2015)[67]

It is important for farms in Malta to increase soil organic carbon, which is the major component of soil organic matter, and is extremely important in all soil processes. It is important for the soil's ability to bind water and thus cope with large fluctuations in precipitation, which is a key concern for Malta in terms of climate adaptation. The annual rate of loss of soil organic matter can vary greatly, depending on cultivation practices, the type of plant/crop cover, drainage status of the soil and weather conditions.

Figure 4.4 Mean organic carbon content of EU soils



Source: JRC

Given these factors, it is important to improve the resilience of agricultural systems, in order to better withstand climate change impacts (adaptation). Sustainable agriculture needs to be designed to cope with the changing climate, which in Malta means higher summer temperatures, a much reduced annual rainfall with longer dry summers, and more extreme weather events such as storms, gales and hailstones, which occur most often in autumn, winter

[67] EC 2019, CAP Indicators: https://agridata.ec.europa.eu/extensions/DataPortal/cmef_indicators.html.

and spring.

At the same time, it is also important to reduce the negative impacts of Malta's agriculture upon GHGaccumulation, and to seek to increase the positive impacts whereby agriculture can lock up more carbon through enhanced soil management and appropriate land use choices, and also contribute tothe generation of renewable energy (mitigation). This would imply reducing use of manufactured chemical N-fertilizers and reducing methane emissions from livestock wastes through more efficient management; also considering a shift in land use from annual cropping to permanent tree crops or other vegetation, and the planting of more trees in the farmed landscape, especially indigenous species that are well-adapted to Malta's dry climate. Better soil husbandry to increase the carbon content of Maltese soils, would also be beneficial for climate mitigation, and Maltese rural areas can also make an important contribution to renewable energy and enhanced energy efficiency which will reduce the country's energy dependence upon fossil fuels.

Malta's Low Carbon Development Strategy (LCDS or "Strategy")[68] maps out the country's decarbonisation journey up to 2050, following the publication of a Low Carbon Development Vision (LCDV) in 2017. Malta is already subject to GHG mitigation commitments under the EU climate action regulation. This Strategy lays out a number of proposed measures, spanning: Energy, Transport, Buildings, Industry, Waste, Water, and Agriculture and land-use, land-use change and forestry (LULUCF).

Under the LCDS, measures targeting water use of different sectors are implemented, including investment in technology to improve irrigation efficiency in farming. The potential abatement of these measures is small compared to other sectors. In the Maltese Islands there is already wide use of efficient irrigation systems: most recent estimates are that 52% of holdings apply drip irrigation, 29% apply sprinkler irrigation and 19% use surface irrigation[69], but there is still significant scope for further investment in water efficiency. Government will further support farmers in transitioning to more efficient irrigation through training, education and promotion; financing of smart irrigation systems; and completing a feasibility study on the introduction of irrigation systems that minimise evaporation and collect dew moisture through deficit irrigation strategies. As Malta's grid carbon intensity decreases over time, the GHG emission abatement benefit of reduced energy demand for electric-powered pumps and treated wastewater production diminishes. However, the benefit of investment in efficient irrigation in terms of resilience to water scarcity remains relevant.

The LULUCF Regulation includes the removal and emissions of GHG from land use, land use change and forestry. Malta's specific circumstances create a challenging backdrop, with high population density and limited land availability, combined with low rainfall, which limits the potential for sequestration in new vegetation. The total sequestration potential of existing and new forests reported in Malta's national forest plan was only 10 ktCO2e/yr, which is

[68] Malta, Low Carbon Development Strategy, October 2021, https://unfccc.int/sites/default/files/resource/MLT_LTS_Nov2021.pdf.

[69] Eurostat (2010) Share of holdings applying different irrigation methods 2010, accessed 22 May 2019, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Share_of_holdings_applying_different_irrigation_methods,_EU-28,_NO_and_CH_2010,_(%25).png

insignificant compared to emissions of c. 1,000 ktCO2e/yr. Given the competition for land use in the Maltese archipelago, no such mitigation/ offsetting measure was included in this LCDS.

Under the LCDS, two measures targeting enteric fermentation are considered for the longer term:

- optimization of cattle feed to minimize emissions, principally through the use of nitrate as a feed additive, with further (but more uncertain) potential abatement as a result of improving forage digestibility and through high-fat diets; and potential future use of a vaccine which targets methane-producing microorganisms in the rumen.

- diversification in commercial scale aquaponics-based food production in place of conventional agricultural production of 36% of Maltese fruit and vegetables.

LCDS data indicates that potential abatement in this sector is small compared to other sectors. While only the use of nitrate as a feed additive has been modelled within the Strategy, improving the digestibility of forage and higher-fat diets should also be considered. Efforts are underway by the sole supplier of dairy cattle feed in Malta to optimise the fat content of cattle diets, and progressive farms are exploring opportunities to improve the quality of forage.

The Maltese Agency for the Governance of Agricultural Bio-Resources is developing its Agricultural Waste Management Strategy, to better manage pig slurry by dewatering and separating the liquid fraction from the solid fraction for treatment.

Climate change adaptation

The positive and negative effects of climate change are mainly driven by changes in rainfall patterns, changes in temperature, frequency and severity of extreme events, also rise in sea level, which make the cultivation of certain crops more difficult in southern regions (see SO5 for more details).[70] In Malta, the likelihood is that rainfall will reduce, summer temperatures and drought will be higher and longer respectively, and winter crop growth will be more threatened by severe damage from extreme weather events. Malta's 2030 National Energy and Climate Plan reaffirms commitment to address climate issues that will contribute towards the European Union's collective target of 40% reduction of its GHG emissions by 2030.[71]

Climate change will increase water scarcity and extreme weather events in Malta including flash flooding, severe storms and heatwaves. Rainfall is seasonal, with 70% of the annual precipitation occurring from October to March. During the short winters sufficient rain falls for crop irrigation but soil retention does not provide sufficient storage for the relatively warm and dry spring seasons. There are no perennial surface streams in Malta and rainwater only flows along the bed of major valleys for a few days after heavy downpours, with about 6% of

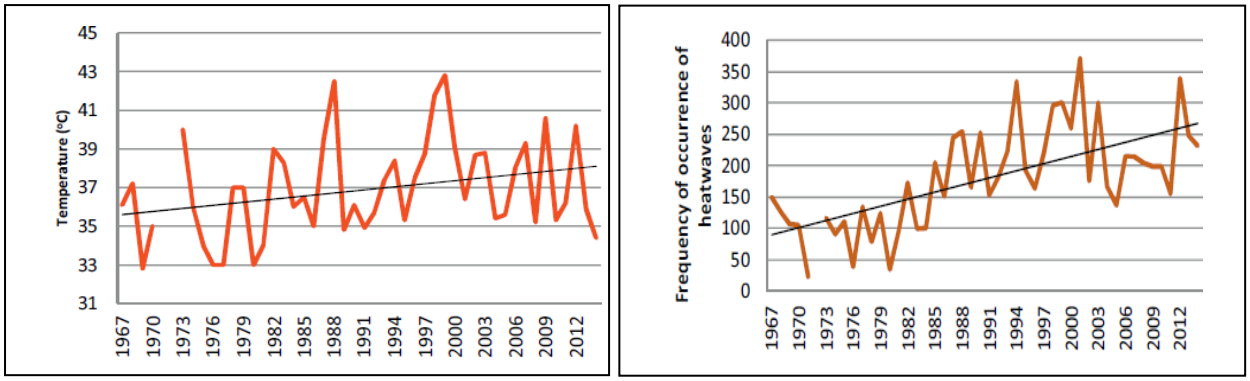
[70] Key Policy Objectives of the Future CAP, https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/future-cap/key-policy-objectives-future-cap_en (accessed 13 April 2020)

[71] Malta's 2030 National Energy and Climate Plan, December 2019, https://energywateragency.gov.mt/wp-content/uploads/2021/10/MT-NECP-FINAL-2020-10-05_Corrigendum.pdf

the total precipitation finding its way directly into the sea via this surface runoff.[72]

Malta is amongst the world's top ten water scarce countries with only 60m^3 of naturally occurring freshwater per capita from groundwater, 120m^3 including harvestable rainfall. The limited water resource makes the country dependent on desalinated water for around 57% of its potable water production (Malta Natcom, 2014[73]). Desertification, soil and coastal erosion are all significant effects of climate change on soil, which may lead to soil depletion and increase pressures on the agricultural sector, since soil is a scarce resource.[74]

Figure 4.5 Trends in maximum annual temperature and in heatwaves, Malta, 1967-2014



Source: Galdies et al, 2016 [75]

[72] Republic of Malta, Ministry for Rural Affairs and the Environment and the University of Malta, 2004. The First National Communication of Malta to the United Nations Framework Convention on Climate Change; https://unfccc.int/resource/docs/natc/mlt_nc01.pdf.

[73] The Third, Fourth, Fifth and Sixth National Communication of Malta under the United Nations Framework Convention on Climate Change, https://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/mlt_nc3,4,5,6.pdf

[74] State of the Environment, Chapter 7 Land and Coast, pg 51https://era.org.mt/wp-content/uploads/2019/05/SoER-Summary-Report-2018.pdf

[75] Galdies, C., Said, A., Camilleri, L., Caruana, M. (2016) Climate change trends in Malta and related beliefs, concerns and attitudes toward adaptation among Gozitan farmers. Europ. J. Agronomy 74(2016), pp18-28; https://www.researchgate.net/publication/286412940_

Many of Malta's more valuable and currently competitive agricultural sectors are climate-vulnerable. Indoor livestock and horticulture rely upon inputs that must be currently imported using fossil fuels, and the infrastructure of glasshouse production sectors suffer damage due to extreme weather events. A continued supply of suitable quality water for crop irrigation and to meet the needs of livestock producers is essential and at present, this is vulnerable to the imminent risk of aquifer exhaustion and degradation, although alternative water sources are being actively developed and rolled out across the islands. Malta's 2nd Water Catchment Management Plan (WCMP) has taken considerable water demand management measures to mitigate water scarcity, such as reducing waterleakages, harvesting of rainwater, recycling and reuse of water resources[76]. Plans are underway for Malta's 3rd Water catchment Management Plan that will include further measures for improved water management. Furthermore, actions contributing towards sustainable water management are foreseen through the draft *National Investment Plan for Water and Wastewater Sector 2022 – 2030*, which includes measures that address potable water, rainwater runoff and actions targeting the effective protection of groundwater resources, amongst others.

Further adaptation in Maltese agriculture thus implies some shift of cropping and husbandry systems towards more drought-tolerant and less fragile options, which could include a range of possibilities such as permanent crops (citrus fruit, vines and other drought-tolerant fruit trees/bushes, olives, nuts, carob and niche options such as herbs and spices); also more robust indoor or closed agricultural systems such as hydroponic activity and vegetable production; more extensive and low-impact livestock systems such as low-density sheep and goat production with outdoor grazing, rather than more intensive indoor systems dependent upon bought-in feed, which has a much higher carbon footprint than semi-natural vegetation. Some of these options have been considered and planned for through Malta's Agricultural Policy for the Maltese Islands 2018-2028 whereby policy measures encourage agricultural practices that use new technologies that have a lower impact on the environment and significantly reduce GHG emissions.[77]

Climate change mitigation

With the adoption of the Doha amendments to the Kyoto Protocol, an overall quantified GHG emission reduction target of 20% compared to 1990 levels has been inscribed for Malta for the second commitment period.[78] Malta faces considerable challenges in respect of this reduction target: national emissions have grown by 52% between 1990 and 2012, with the main sources being energy generation and transport (Aquilina et al, 2014).

Maltese agriculture, like many other sectors, is heavily reliant upon processes and inputs generated through fossil fuel use which contributes to climate change. Also, as described in more detail for SO 5,Maltese soils are relatively low in carbon and the landscape consists of various habitats including steppe, garigue and maquis that include low lying shrubs, small trees and sparse vegetation that is typical of Mediterranean countries (Figure 4.6), so its inherent ability to absorb carbon dioxide is

[76] The 2nd Water Catchment Management Plan for the Malta Water Catchment District Water Plant pg. 552 https://era.org.mt/en/Documents/2nd_Water_Catchment_Management_Plan-Malta_Water_in_Maltese_Islands.pdf

[77] National Agricultural Policy for the Maltese Islands 2018-2028 pg. 213; https://meae.gov.mt/en/Public_Consultations/MSDEC/Documents/National%20Agricultural%20Policy%20for%20the%20Maltese%20Islands%202018%20-%202028.pdf.

[78] Aquilina N., Attard M., Borg S., Ciarlo` J., Fenech S., Kemp L., Muscat D., Pace P., Quol C., Refalo L., Vassallo S. (2014). The Third, Fourth, Fifth and Sixth National Communication of Malta: under the United Nations Framework Convention on Climate Change. The Malta Resources Authority; https://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/mlt_nc3,4,5,6.pdf.

limited.[79]

Figure 4.6 - Malta's land cover, 2012 (source: EEA Country factsheet, 2012)[80]

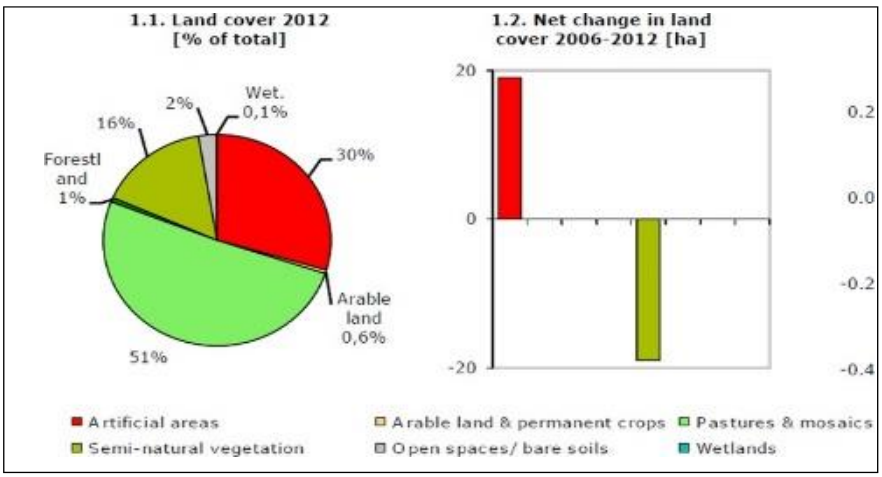
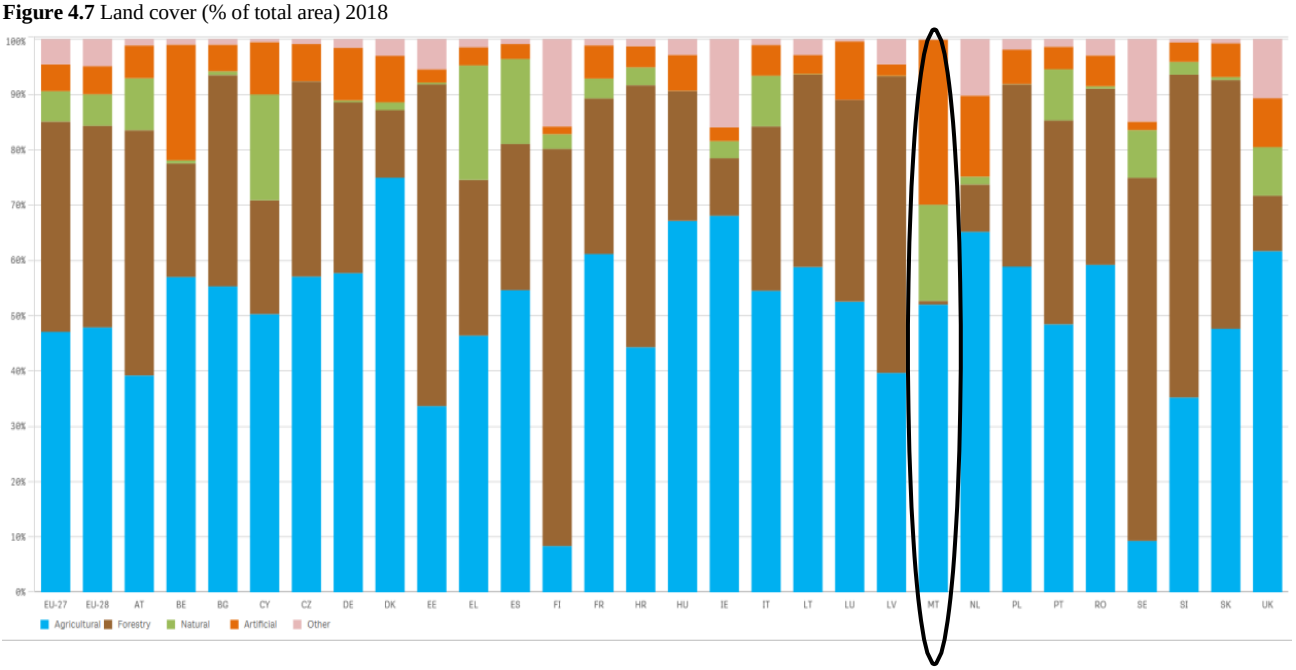


Figure 4.7 Land cover (% of total area) 2018



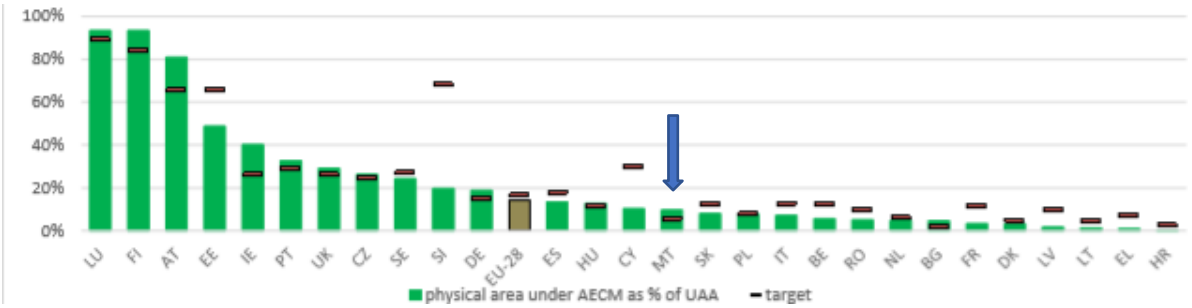
Source: EC CAP Indicators Environment and Climate Action https://agridata.ec.europa.eu/

Malta planned to have 6% of its UAA under Agri-environment and climate measures in 2017, the physical area in 2017 (9.6%) was above the target as illustrated in Figure 4.8. However, only 5% of theagricultural land was under contracts to improve soils in 2018.

[82] State of the Environment Report 2018, Chapter 4 Biodiversity, https://era.org.mt/en/Documents/ERA%20-%20STATE%20OF%20THE%20ENV%20REPORT_V2.pdf

[80] Clearly this refers to the farmed landscape with a mosaic of small fields: Malta has no pastures. Malta Landcover country factsheet 2012; https://www.eea.europa.eu/themes/landuse/land-cover-country-fact-sheets/mt-malta-landcover-2012.pdf/view.

Figure 4.8 Physical area under AECM, (2017) as % of UAA, EU Member States



Source: DG Agri, EC

Malta's Low Carbon Development Strategy and Malta's 2030 National Energy and Climate Plan highlight the importance of sustainable development and its importance in achieving economic, social and environmental goals. In view of Malta's limited landspace, Government aims to ensure that land space can be used to generate renewable sources of energy as presented in Malta's National Energy and Climate Plan, however such scope within the agricultural sector remains limited.

Wind is an ever-present feature, but its temporal variability renders it a difficult source for renewable energy except at micro-scale, and Malta's tidal variation is too limited for this to be a viable source. Bioenergy from cropping is not favoured due to the high population/ low availability of land and low compatibility of climate for such crops.

The Agriculture Policy also tackles the issue of farm waste, ensuring adequate manure management to reduce its greenhouse gas emissions while at the same time, generating revenue that can offset the costs that are required for combatting pollution. On the other hand, the National Inventory Report (2018) notes that greenhouse gas emissions from agricultural waste are not considered to be a significant source in Malta, by comparison with other much larger sources.

Strengths

Already high generation of solar power and renewable clean energy, support for which has been provided through both natioanally and EU funded schemes over the past years.

Previous RDPs have supported energy efficiency measures, through for example, the construction of new farms that are more energy efficient, and the purchase of new machinary nd equipment that are more efficient with regards to the use of resources and energy. .

Low usage of energy in the agricultural sector, with a value that is one of the lowest across all EU Member States and is also well below the EU average.

Some indigenous and potentially high-value or distinctive agricultural products are already well-adapted to Malta's dry climate and extreme weather conditions; permanent crops including olives,

vines and carob, and there are market opportunities to expand production in these sectors.

Low GHG emissions generated by the agricultural sector, with the share of agricultural emissions not fluctuating much over the years, with a reduction in emissions also registered between 1990 and 2017, as outlined in the NECP (2019).

Weaknesses

Comparatively high levels of GHG emissions from overuse of fertilisers and generation and management of livestock manures, when calculated per head, in view of Malta's small land size. However when compared to other major sectors, the agricultural sector contributes only insignificantly to GHG emissions.

Malta's agriculture in some sectors is heavily dependent upon fossil fuels – e.g. for imported feedstuffs, chemical fertilisers, plant protection products and veterinary medicines, for the extraction of water from underground sources and for heating or cooling indoor livestock facilities which leads to further greenhouse gas emissions.

Knowledge concerning best practice for adaptation and mitigation of climate change in agriculture is not well-embedded across the farming community in Malta. There is a lack of accessible research and knowledge exchange on the topic of how best Maltese producers can switch to more climate-friendly production methods, including reduced reliance on chemical fertilisers and pesticides, water-saving practices, and alternatives to the use of fossil fuels (e.g. for groundwater abstraction, transport of goods to market, cooling.)Poor knowledge and understanding of the scope and significance of climate-mitigating measures andstrategies in Maltese agriculture threatens the viability and extension of climate proofing in this sector. Soil erosion leading to desertification as a result of climate change can have substantial challenges on the natural environment and agriculture, and mitigation measures have been included in Malta's National Agricultural Policy 2018-2028.[81]

Even though all of the livestock in Malta is housed, outdorr grazing does not take place and stringent regualtions are in place as regards the storage of manures and slurries, methane and ammonia emissions from housed cattle and associated slurry stores still contribute, to a small extent, to the country's GHG emissions.

Opportunities

Improved energy efficiency on farms by investing in modern technologies can reduce both energy consumption and GHG emissions.

Encourage better soil management practices that aim increase carbon content in the soil, through research and development and advice
In order to increase carbon capture on holdings and aid carbon sequestration, there are opportunities for the replacement of annual cereals by permanent crops, and through the promotion of tree planting along field boundaries that will not only contribute to to increase carbon sequestration on farms but also reduce soil erosion.

[81] National Agricultural Policy for the Maltese Islands 2018-2028 pg. 193; https://meae.gov.mt/en/Public_Consultations/MSDEC/Documents/National%20Agricultural%20Policy%20for%20the%20Maltese%20Islands%202018%20-%202028.pdf

Encourage livestock sectors to invest in sustainable and low-carbon, Maltese animal feeds and equipment to manage farm waste in order to further reduce emissions from the agricultural sector, even though their contribution is not significant, when compared to other sectors such as energy production.

More research is necessary to help producers consider switching to less climate-vulnerable productionsystems, e.g. switching choice of vegetables to drought-tolerant species and varieties and moving into various forms of permanent cropping. Further research is also required with regards to the development and promotion of lower carbon inputs.

There are opportunites for farmer to adopt enhanced risk management prevention practices on their holdings, for climate adaptation.

Threats

The Maltese Islands are particularly susceptible to the effects of climate change including flooding, desertification, coastal erosion leading to soil erosion, water scarcity, drought, the impacts of more intense storms, rise in sea levels, and other climate changes.[82] Protection of soil and water will be necessary to prevent the negative impacts this will have on the ability of ecosystems to function properly and to safeguard the benefits that such systems can provide as part of a resilient landscape. This threat was also identified in the RDP 2014 – 2020 and remains very relevant.

Impact of geopolitical instability which leads to increase in the costs of inputs and supply chain disruptions may hinder the shift towards long term climate change measures for more short-term needs.

Implications for needs and the case for intervention

There is a continued need for intervention to encourage decarbonisation in Malta's farm sector alongside action across the wider economy. Reduced reliance on imported inputs and greater re-use and recycling of basic resources and agricultural wastes continue to merit investment in infrastructure and farm-level actions alike. Meanwhile, support for renewable energy is foreseen through other funding programmes which aim to diversify energy supply and decarbonise Malta's economy.

Malta's agricultural sector may stand to gain from increased participation with research platforms, such as the Partnership for Research and Innovation in the Mediterranean Area (PRIMA), which is a joint programme focusing on the development and applications of solutions for more sustainable management of water and agro-food systems, and reduction of waste losses in the Mediterranean basin.[83]

Support for innovation to encourage farmers to consider new systems which are more climate-friendly and resilient, which can be financed through the on-farm productive investments intervention, would be particularly valuable. In order for such support to be effective, prior promotion and education of farmers in climate change issues and scenarios for Malta will also be essential. Training and advice will play an essential role here, not just in raising awareness about risks faced, but also potential

[82] State of the Environment, Chapter 7 Land, pg 51 Coast; https://era.org.mt/en/Documents/ERA%20-%20STATE%20OF%20THE%20ENV%20REPORT_V2.pdf.

[83] Partnership for research and Innovation in the Mediterranean area (PRIMA), https://ec.europa.eu/research/environment/index.cfm?pg=prima.

strategies and technologies for decreasing risk and adapting to change. Training will also be required in partnership working and collaborative actions, as well as working with the existingco-operatives across the farm sector to encourage them to develop more climate-proof strategies. The AGRICONNECT and AGRIHUB services could potentially be relevant in this context.

Additionally, there is also scope for intervention through the programming of EAFRD agri-environment-climate measures, including organic farming, and eco-schemes under EAGF that can contribute to climateadaption or mitigation. Interventions under EAGF will include support for the eco scheme related to land parcels dedicated for biodiversity purposes, and encouraging farmers to adopt and follow an Integrated Pest Management Plan (IPMP). EAFRD interventions will offer support for the coversion and maintenance of organic farming, and land based management commitments that support farmers who underatke on a voluntary basis land based management commitments which are beneficial to achieving the aims of the CAP SP.

Thus the needs for this SO are:

4.1 Improved distribution and utilization of treated wastewater and ensure sustainable irrigation for crops

4.2 Improve risk management in Maltese agriculture and make farmers more financially resilient

4.3 Use animal and agricultural waste and residues as a resource

4.4 Reduce use of chemical N-fertilizers and other inputs with similarly high carbon footprint

4.5 Knowledge exchange, training and advice to help reduce, reuse and recycle resources on farms

4.6 Research, innovation, and demonstration aimed at moving towards low carbon agriculture

4.7 Knowledge exchange, training, advice and investment support to improve farmclimate change

Specific Objective 5: Foster sustainable development and efficient management of natural resources such as water, soil and air, including by reducing chemical dependency

Context and evidence

The efficient management of water and air is fostered at EU level by the Water Framework Directive (2000/60/EC) and the Ambient Air Quality Directive (2008/50/EC) which set targets and dates for achieving more sustainable natural resources management. Their provisions are also linked to legislation on emissions, in the context of air quality and climate change (NEC Directive (EU) 2016/2284), and sustainable use of Pesticides (SUD Directive 2009/128/EC). These form a framework against which Maltese policies and action on water, air and the impacts of agriculture on natural resources must all be considered. They are incorporated within the Malta Environment Protection Act (Cap 549).

In Malta the spatial pattern of soil types is very intricate, both in semi-natural and agricultural areas and different soil types often occur within a single field or within a distance of few metres (SoER, 2018). The first comprehensive soil survey of the Maltese islands was carried out by Lang, in 1960. The findings of Lang (1960) on the Maltese soils which are still valid1 were that soils are largely artificial, being man-made or altered; highly calcareous, with some soils of the 'Terra' group relics, dating back to periods of wetter climate; and where soil differences are dominated by variation of the parent material. Natural profiles show scant differentiation below the 'very thin humus horizon' as noted in the Soil Baseline Survey held in 2013.[84] The ESDAC database estimates topsoil organic matter content for Malta of less than 0.1 peta-grams in total, or well below 1%[85]. However, empirical surveys in recent years suggest higher figures: The average soil organic carbon content for sample sites across Malta that were assessed in both 2003 and 2013 (70 sites in total) was 2.11% for 2003 and 2.30% for 2013. 59% of locations assessed in 2013 had higher organic carbon content than the same locations in 2003[86]. The Rural Development Programmes for Malta 2007-2013 and 2014-2020 supported a number of measures to combat soil degradation and reverse decline of organic matter. The SoER 2018 suggests that 'the observed increase in soil organic matter may in part be the result of such initiatives.'

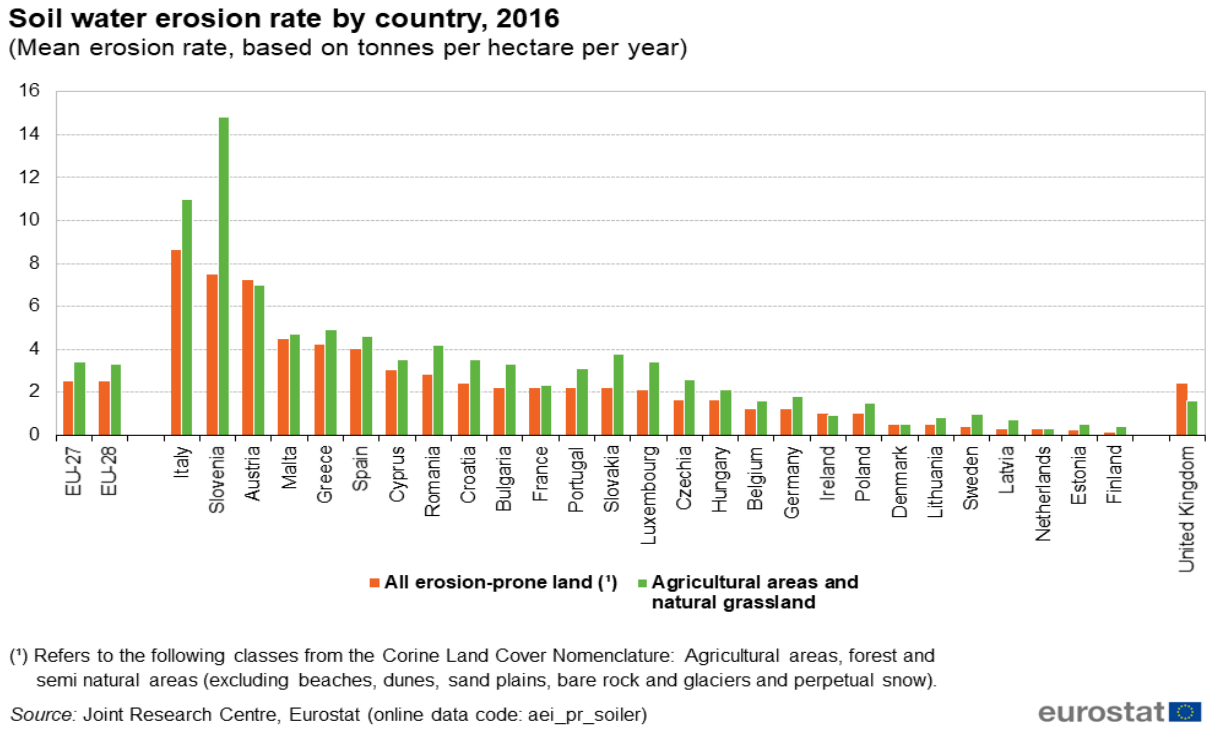
Terracore (2013) concluded that in Malta, the pressures on land have increased, as a consequence of increasing urbanisation, development and intensification of agricultural systems. In Malta, the main threats to soil are erosion, decline in organic matter, soil contamination, and salinization. Moreover, Maltese soils are susceptible to desertification as a direct effect of climate change which poses a major threat to the natural environment in view of the importance of soil as a habitat to support ecosystems as well as to sustain agricultural activity.[87]
Malta's soil is naturally low in soil organic matter (SOM), as result of the local climatic conditions. The State of the Environment Report (2018) notes that this situation is similar to that of other

[84] Service Tender for a Soil Baseline Survey, Terracore Consultants (2013), available at https://era.org.mt/en/Documents/Report%20on%20the%20Soils%20Baseline%20Survey%20findings.PDF
[85] https://esdac.jrc.ec.europa.eu/resource-type/soil-data-maps
[86] State of the Environment Report, Malta, 2018 – Land and coast, p.37 https://era.org.mt/en/Documents/SoER%20Summary%20Report%202018.pdf
[87] National Agricultural Policy for the Maltese Islands 2018-2028 pg. 193; https://meae.gov.mt/en/Public_Consultations/MSDEC/Documents/National%20Agricultural%20Policy%20for%20the%20Maltese%20Islands%202018%20-%202028.pdf.

countries in Southern Europe. The majority of Maltese soils, 58%, have a low or very low soil organic carbon content (< 20 g/kg)'[88]. Most Maltese soil also has a clay texture with frequent stones, an alkaline pH arising from the calcareous geology, and moderate fertility with some quite high levels of minerals such as lead, copper and arsenic.

Soil erosion is exacerbated by various factors, including land fragmentation and abandonment, unsustainable agricultural practices and rapid urbanisation and is triggered by both natural and anthropogenic factors, including steep gradients, intense precipitation, low vegetation cover and inappropriate land use. Loss of topsoil, that is the most fertile part of the soil profile, causes most concern.[89] The estimated proportion of the UAA at risk of soil erosion in 2018 in Malta was 19.3%[90], higher than the EU average, and the estimated soil water erosion rate in 2016 was almost 5% (Figure. 5.1).[91] The calculated total soil volume eroded annually in National agricultural areas amounts to 766,278 m^3, a significant cause of which is identified as land abandonment leading to a lack of maintenance of traditional terraces with rubble walls, that contain the soil on sloping land.[92] The yearly cost incurred by the average agricultural farmer to replace eroded soils and artificially maintain soil quality in erosion affected areas amounts to over 65% of the average yearly economic revenue from Maltese Utilised Agricultural Area.[93]

Figure 5.1 Estimated share of agricultural land at risk of soil loss by water erosion, EU28, 2016



(1) Refers to the following classes from the Corine Land Cover Nomenclature: Agricultural areas, forest and semi natural areas (excluding beaches, dunes, sand plains, bare rock and glaciers and perpetual snow).

Source: Joint Research Centre, Eurostat (online data code: aei_pr_soiler)

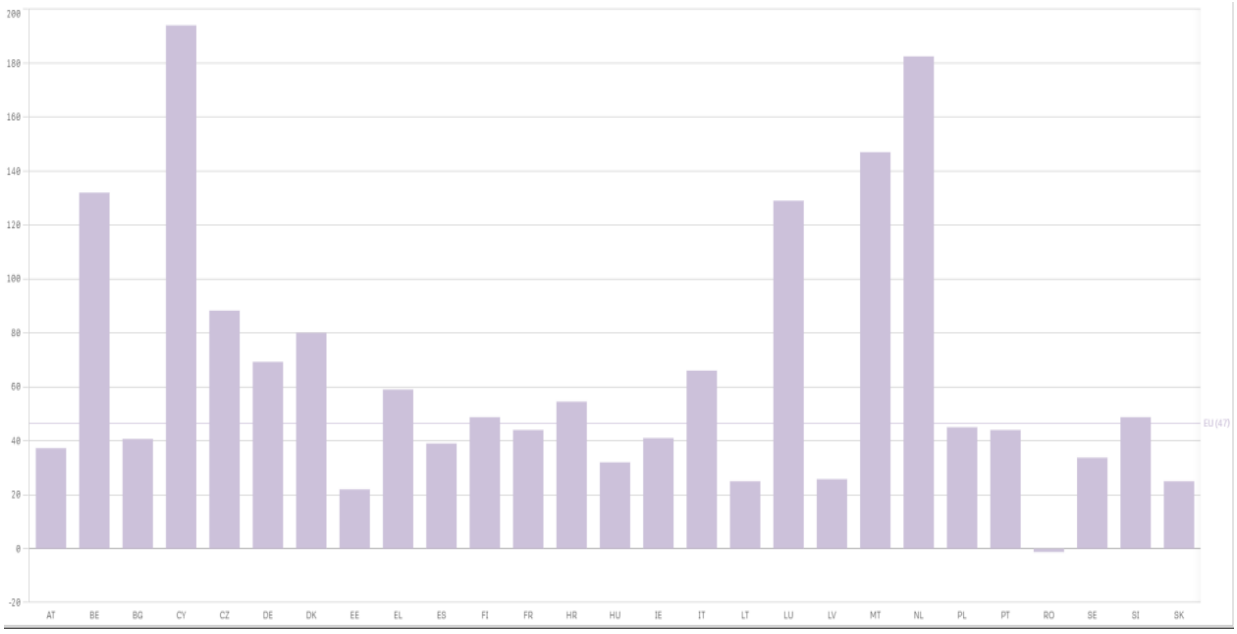
eurostat

[88] SoER05 background report on soils (2018), at: https://era.org.mt/en/Documents/SOER05_Background_Report_Soil.pdf
[89] State of the Environment Report 2018, Chapter 4: Land and Coast https://era.org.mt/en/Documents/Chapter4_LandCoast_26Nov2018.pdf
[90] Ibid.
[91] EC (2019) Analytical factsheet for Malta: Nine objectives for a future Common Agricultural Policy, p.9: https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/by_country/documents/analytical_factsheet_mt.pdf
[92] State of the Environment report 2018, Land and Coast, https://era.org.mt/en/Documents/SoER%20Summary%20Report%202018.pdf
[93] State of the Environment Report – Summary Report, pg. 11, https://era.org.mt/en/Documents/SoER%20Summary%20Report%202018.pdf

Apart from marking boundaries, traditionally built rubble walls, consisting of random stone walls and traditional rubble walls built using traditional methods and techniques using random rubble (*sejjieħ*), without cement or mortar, have important environmental roles. Rubble walls enable slopes to be modified to terraced fields, aid soil retention in fields, shelter crops in exposed areas and serve as habitats for local flora and fauna. Rubble walls also form an integral part of the rural landscape of the Maltese Islands.

Horticultural cropping has led to high levels of use of chemical fertilisers in recent decades: in 2007, the gross nitrogen balance of Maltese soils was estimated to be 2.5 times higher than the median value for the EU-27 (NSO, 2007)[94] and by estimated gross nitrogen balance in Malta amounted to 147, by comparison to the EU average of 47, which was the third highest value per Member State, after Cyprus and the Netherlands.

Figure 5.2 Estimated gross nutrient balance (Kg N/ha/year), 2017[95]



Source: Eurostat Agridata

Soils on Malta are vulnerable to erosion by rain and wind and also to salination linked to the continued use of irrigation water from boreholes tapping into the diminished groundwater aquifers which are slowly drawing in saline water from the surrounding sea. Maltese aquifers are subject to seawater intrusion that results in high levels of chloride concentrations in aquifers. Twelve of the fifteen aquifers have also been reported as being heavily polluted by nitrates, sourced primarily from the excessive use of natural and artificial fertilisers in arable agricultural practices. (SoER, 2018).

[94] National Statistics Office (2008), Gross Nitrogen Balance for Malta (2007): so.gov.mt/en/publicatons/Publications_by_Unit/Documents/B3_Environment_Energy_Transport_Agriculture_Statistics/Gross_Nitrogen_ Balance_for_Malta.pdf.

[95] EC Water Quality and Availability (EU 27) European 27 https://agridata.ec.europa.eu/extensions/DashboardIndicators/WaterQuality.html?select=EU27_FLAG,1

While certain agricultural practices lead to a negative impact on soil quality and increased soil erosion, adequate soil quality is required for agriculture, in order to provide farmers with a sustainable income. Actions aimed at improving soil quality and preventing irreversible degradation are of utmost importance, not only to ensure optimum soil status but also a soil that can support productive agriculture. Only 0.4% of the agricultural land is organically farmed and this has only been established in recent years. Livestock numbers in Malta have been declining over the past decade in all sectors except for sheep, goats and laying hens[96], but it should be noted that all livestock are currently housed – there is no outdoor grazing livestock in Malta. Whilst overall livestock density in Malta in 2016 is relatively high, at 2.8 LU/ha overall, the change in livestock density for Malta, from 2013 to 2016, shows one of the sharpest declines of all Member States - of over 8% (Eurostat note 14882, 2017).

Domestic use and agriculture pose the highest demand on groundwater. Approximately 43 – 46% of the total potable water produced is extracted from ground water, with the remaining 54 – 57% consisting of desalinised water produced by the three desalinisation plants located in Cirkewwa, Pembroke and limits of Siggiewi.[97] Mixing with water produced from desalination plants is necessary to ensure good quality potable water.

Malta's water resources are scarce and highly seasonal, and threatened by climate change, as already discussed in Specific Objective 4. Sourcing of water is constrained by the fact that permanent above- ground freshwater bodies are absent, and rainfall is limited. Most of the naturally occurring freshwater is found in underground aquifers, accessible by extraction via pumping stations and boreholes. In the early 1980's desalination of seawater was introduced, through the investment in reverse osmosis plants, now accounting for more than half of the production of potable water in the country.[98]

Effective rainwater harvesting of Malta's infrequent but heavy rainfall during the winter months was lost as a regular practice in recent decades, but now policies are encouraging reinstatement across the islands' territory, via the restoration of infrastructure such as rubble walls, channels reservoirs, and the cleaning of valley beds, within the farmed landscape. Malta's 2nd WCMP acknowledges the sector's current reliance on ground water for irrigation and provides measures to address water scarcity and over-abstraction of ground water through the restoration of over-drawn aquifers and investment in smart irrigation technology[99]. Building on the 2nd WCMP, actions contributing towards sustainable water management are foreseen through the draft National Investment Plan for Water and Wastewater Sector 2022 – 2030, which includes measures that address potable water, rainwater runoff and actions targeting the effective protection of groundwater resources, amongst others. This will aim to continue addressing the dependence on ground water, with almost half of its water coming

[96] NSO (2022), Census of Agriculture 2020, https://nso.gov.mt/en/News_Releases/Documents/2022/02/News2022_015.pdf

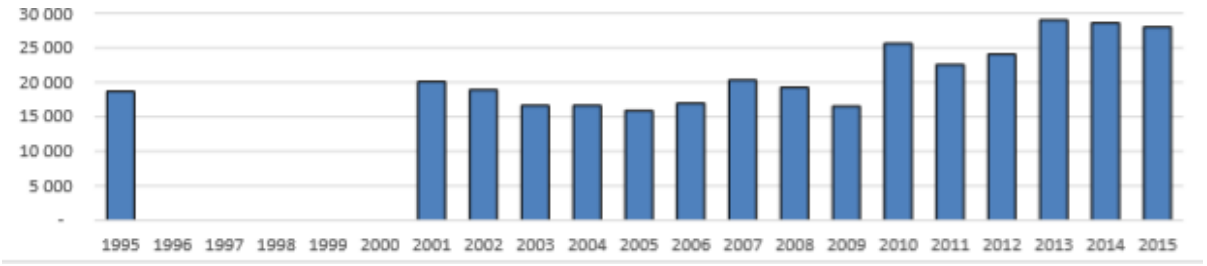
[97] State of the Environment Report 2018, Summary Report https://era.org.mt/en/Documents/SoER%20Summary%20Report%202018.pdf

[98] The Fourth Biennial Report of Malta under the United Nations Framework Convention on Climate Change (2020); https://unfccc.int/documents/230617.

[99] The 2nd Water Catchment Management Plan for the Malta Water Catchment District Water Plant pg. 552 https://era.org.mt/en/Documents/2nd_Water_Catchment_Management_Plan-Malta_Water_in_Maltese_Islands.pdf

from this source. Water abstraction by farms in Malta showed an upward trend since 2000 but with some levelling off after 2013 (Figure 5.3); 31.4% of the total UAA was irrigated in 2016.

Figure 5.3 Water abstraction by agriculture, Malta (in '000 cubic metres)



Source: Eurostat

Groundwater in Malta is also high in nitrates, with 12 out of 15 groundwater bodies showing nitrates levels that exceed the 50mg/L threshold set by the EU Nitrates Directive. As shown in Figure 5.4 water quality in Malta is of major concern, with 50% rated poor quality, and the remaining 50% only moderate.

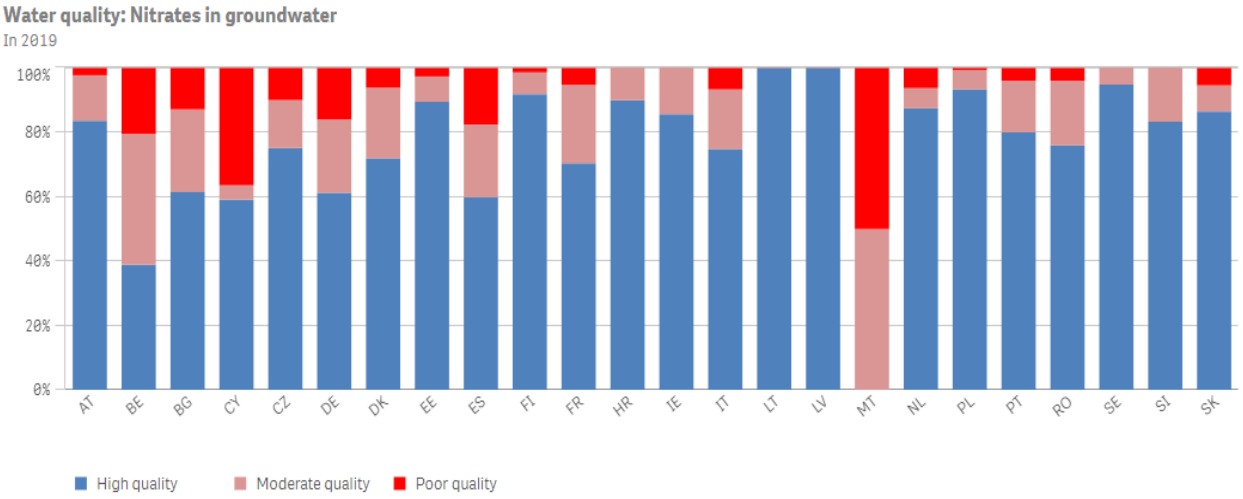
Under the 2014-2020 MFF period, Malta invested in the production of recycled water from sewage (so-called 'new water') through ERDF funding. Through both ERDF and EAFRD funding, a distribution network was set up, to distribute this new water from waste treatment plants to several agricultural areas closest to these plants. This has reduced local pressure on groundwater reserves. It is planned to extend the roll-out of 'new water' across more farmed areas of Malta and Gozo, in future, subject to the necessary investment in infrastructure.

Whereas CAP support is expected to extend the distribution of treated sewage effluent to new areas, ERDF is expected to complement such investments through interventions that optimize the current urban wastewater infrastructure and improving the management of discharges to the network, enabling the increased and cost-effective reuse of this resource. ERDF investments are expected to target the management of wastewater enabling the further extension of Malta's water-reuse programme.

Any investments that lead to a net increase in irrigated area shall respect the relevant requirements of Article 74 of Regulation (EU) 2021/2115. In cases of water reuse support, compliance with Regulation (EU) 2020/741 and the provisions and objectives of WFD will be ensured.

Figure 5.4. Water Quality- Nitrates in groundwater (2019)[100]

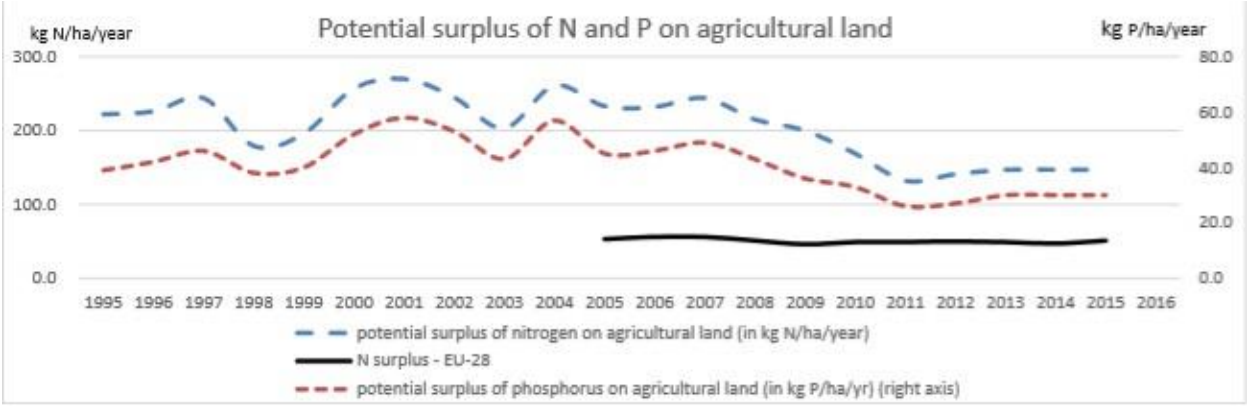
[100] EC Water Quality and Availability (EU 27) European 27 https://agridata.ec.europa.eu/extensions/DashboardIndicators/WaterQuality.html?select=EU27_FLAG,1



Source: Water Quality and Availability, DG-AGRI

In addition to nitrogen, phosphate surpluses in Malta are also relatively high (Figure 5.5). However, there has been a significant decrease between 2007 and 2011 and since then, the surpluses have remained stable, although still at a high level compared to the EU average.

Figure 5.5 Estimated surplus of nitrogen and phosphate on agricultural land, Malta

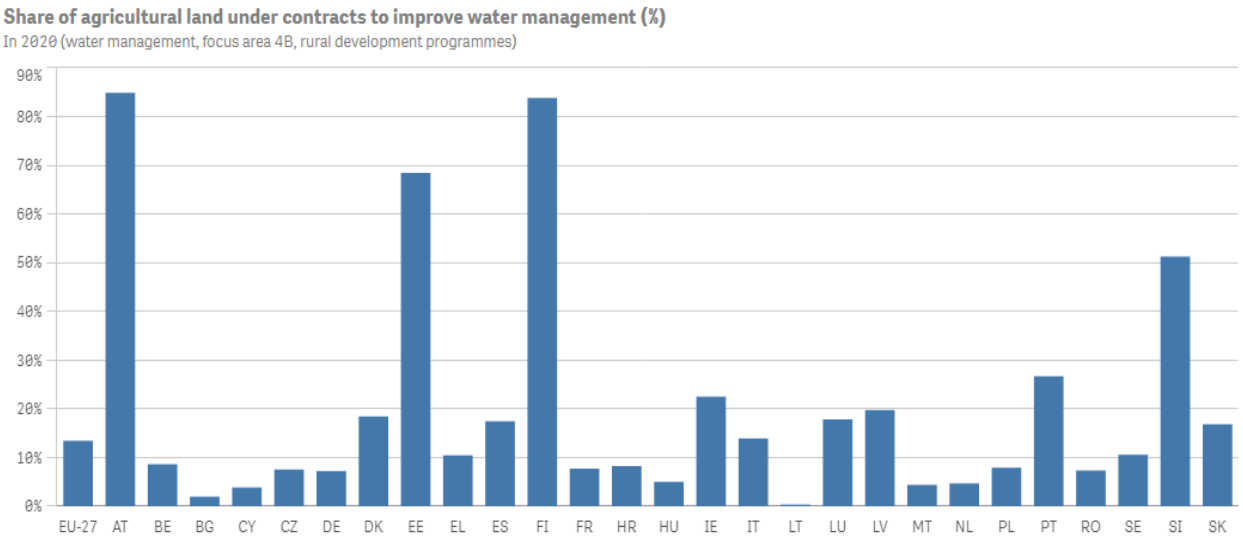


Source: EEA

Furthermore, chloride levels, which provide an indication of the extent of seawater intrusion, are high in five water bodies out of fifteen.[101] According to the Nitrates Action Programme, nitrates in groundwater originate from the over-use of fertilizers in arable agricultural practices. Nitrate contamination is expected to persist, due to the long response time of the aquifer systems in Malta. Only 4% of agricultural land is under contracts to improve water management (Figure 5.6). Despite this, the implementation of the Nitrate Action Programme is expected to have a positive effect on aquifers, reducing nitrate loading over the long term.[102]

[101] State of the Environment Report, Chapter 5 – Marine and Freshwaters, pg. 2, https://era.org.mt/en/Documents/Chapter5_MarineFreshWaters_26Nov2018.pdf
[102] Ibid, pg. 41.

Figure 5.6 % of UAA under contracts to improve water management, EU28, 2018[103]

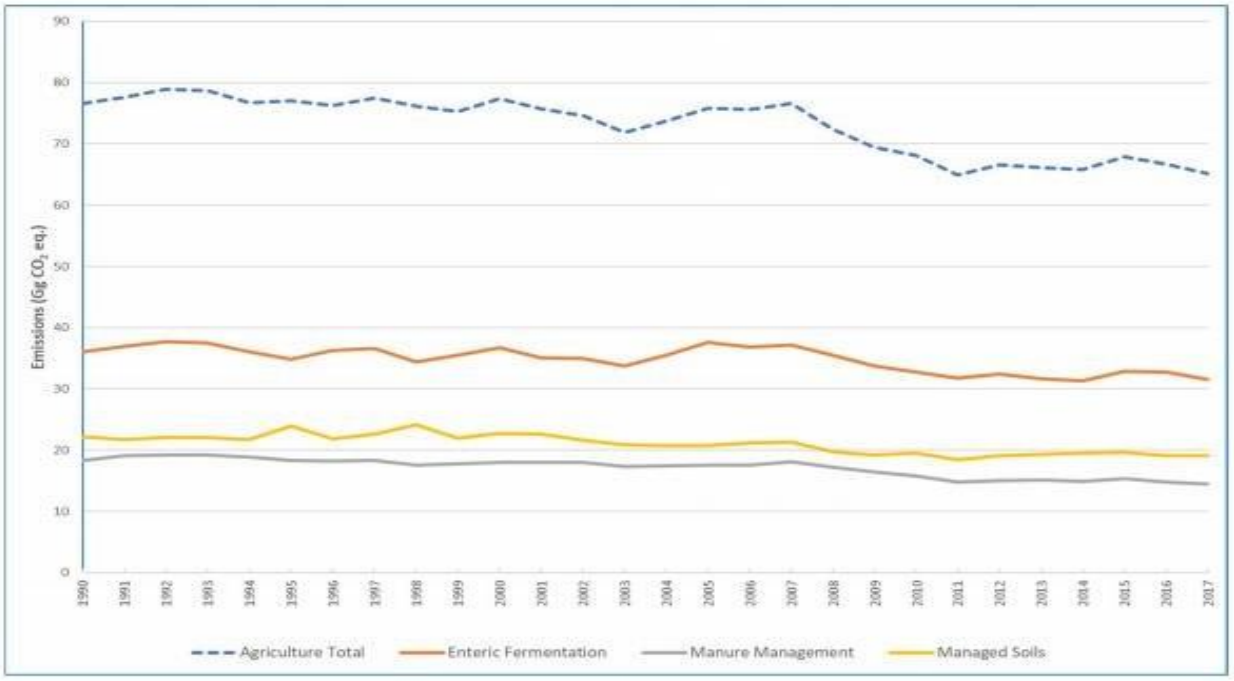


Agriculture and rural sector impacts upon air quality are not a significant source of current concern, other than in respect of the siting of indoor livestock facilities and in the specific case of ammonia. As presented in SO4, agriculture's contribution to GHG emissions in Malta are comparatively minor. The Agricultural sector shows a gradual decrease in total greenhouse gas emissions over the period 1990 – 2007. Enteric Fermentation accounts for almost half of total sector emissions (as presented in Figure 5.7), with Managed Soils and Manure Management accounting for the remainder. The sector has never been a major contributor to overall national emissions.[104]

[103] EC Water Quality and Availability (EU 27) European 27 https://agridata.ec.europa.eu/extensions/DashboardIndicators/WaterQuality.html?select=EU27_FLAG,1

[104] The Fourth Biennial Report of Malta under the United Nations Framework Convention on Climate Change (2020); https://unfccc.int/documents/230617.

Figure 5.7 Emissions of Agriculture sector, Malta, disaggregated by activity



Source: Malta Resources Authority 2019

In respect of ammonia emissions; the agricultural sector is the main source of these emissions. Between 2005 and 2017, ammonia emissions decreased by 22.5% which can be mainly attributed to a decrease in animal heads. The main agricultural sources are the animal manure as applied to soils, and manure management of dairy cattle, laying hens, non-dairy cattle, broilers, pigs and other housed livestock. In 2017, Malta was in compliance with the 2020 (1.5kt) and 2030 (1.3kt) emission reduction commitments as set out in the NEC Directive: projections for 2020 and 2030 made from the 2017 baseline year are well within these ceilings (1.19 and 1.18kt, respectively).[105]

There is a continuing need to educate land-based farming sectors in order to reduce the levels of nitrate fertilizer and pesticide usage[106], and to invest in research and advisory services to encourage more agro-ecological practices. Under the Nitrates Action Plan for Malta, the Agriculture Directorate has appointed a list of technical experts who can provide farmers with advice concerning their obligations under the Plan, which include a rational use of N-fertilisers. The Agriculture Directorate also organises courses concerning the use of fertilizers.[107] This support is complementary to support provided under the CAP Strategic Plan, which can be used to encourage agro-ecological practices going beyond the regulatory baseline established in the Nitrates Action Plan.

[105] Environment and resources Authority Malta's National Air Pollution Programme, 2019. Government of Malta NAPCP.pdf (era.org.mt)

[106] Malta Competition and Consumer Affairs Authority (MCCAA), The revised National action Plan for the Sustainable Use of pesticides in Malta covering the period 2019 – 2023, NAP for the Sustainable Use of Pesticides 2019-2023 for public consultation.pdf (gov.mt).

[107] Nitrates Action Programme, https://agriculture.gov.mt/en/agricultural_directorate/Pages/nitratesActionProg.aspx, accessed 09 March2020.

It could also be suggested, on the basis of scientific evidence from across the EU, that Malta's current intensive indoor livestock systems do not encourage nutrient cycling, because large livestock waste from dairy and pig farms is collected in liquid form and thus is highly toxic and too hazardous to use directly as a fertiliser on land; while small livestock waste is often disposed of, or used as fertiliser, but without testing to reflect its full nutrient value and enable efficient application without over-use (Dwyer et al, 2014).[108] The waste from large livestock installations currently goes for treatment in municipal plants, alongside human sewage.[109] Malta's 2nd WCMP highlights the need for an agriculture waste management plan to tackle agricultural waste.[110]

Farming systems which are based upon fertilisation of crops using appropriately treated and analysed solid manures should be possible as a planned development under Malta's Long Term Waste Management Plan 2021-2030. This would enable crop farmers in Malta to reduce their continued importation and application of chemical fertilisers. Unlike organic manure usage, a reliance upon chemical fertilisation does nothing to improve soil structure, and in Malta there is evidence that it contributes directly to nitrate contamination of both soils and water.

In terms of animal waste management, Malta has one of the strictest regulations on animal manure where livestock are required to be kept under a roof and that adequate manure management systems are in place as to ensure that no leaching of nutrients generated from this activity is leached to the aquifer (SL 549.66). Furthermore, the liquid portion of the manure is stored in a leakproof cesspit which is emptied by a service provider who takes the generated waste to waste treatment facilities. These obligations are a pre-requisite for farms to be licensed to operate. The application of slurry is also not permissible under this local regulation thus, eliminating any risks of increased ammonia emission associated with this activity.

As outlined under Specific Objective 4, Malta is facing infringement procedures concerning urban wastewater with one of the reasons of non-compliance being an excess of farm manure discharges wastewater systems. In order to address the situation, Malta is working towards a complete disconnection of farm waste from the sewage network with the aim of achieving full compliance with the Urban Wastewater Treatment Directive by end of 2026.

As outlined in Malta's Low Carbon Development Strategy, more efficient water resource management is necessary, including in rural areas. Such improvements may be achieved through investment in valleys which are an important ecological and geological source. In this regard, building on the investments carried out through the RDP 2014-2020, Government shall aim to continue supporting valley management practises in order to reduce rainwater loss and to regenerate Malta's hydrological capital.

As also outlined in Malta's Low Carbon Development Strategy, investment in wastewater

[108] Dwyer, J., Temple, M., Jones, J., Muscat, R. and Cordina, G. (2014) Towards a new Agricultural Policy for Malta. Report to the Maltese Department of Agriculture. CCRI, Cheltenham, UK.
[109] Ibid.
[110] The 2nd Water Catchment Management Plan for the Malta Water Catchment District Water Plant pg. 552 https://era.org.mt/en/Documents/2nd_Water_Catchment_Management_Plan-Malta_Water_in_Maltese_Islands.pdf

polishing plants has improved the quality of treated sewage effluent, securing a considerable addition to Malta's water resource budget. This so-called 'new water' shall replace non-potable uses of water, particularly in industry and agriculture. The aim is to maximise the use of this water to address water scarcity, reduce over abstraction and therefore restore the aquifers' qualitative and quantitative status as identified in Malta's 2nd WCMP. Government shall therefore aim to support an agricultural sector underpinned by crop choices which both satisfy the potential for socio-economic growth of the sector but also moderate the demand for water.

Strengths

Many producers of fruit and vegetables now have efficient drip-irrigation equipment installed on their holdings, and more efficient technologies (e.g. IT soil moisture monitoring and management systems) are available to encourage continuous improvement in this respect.

European and Maltese legislation in recent decades has helped to establish a baseline of enhanced standards of water management among the Maltese farm sectors.

The 2014 – 2020 RDP has been an important tool in the improvement of the wide network of rubble walls across the Maltese Islands, which are essential to mitigate soil erosion and therefore importantfor soil retention and also for biodiversity purposes.

Growing use of smart metering which aims to improve monitoring of water usage, with the aim of improving water management

Cohesion and RDP funding from the 2014 – 2020 programming period has supported the laying of a network through whichm treated sewage effluent for irrigation is being distributed to locations where agriculture is predominant. This increasing network of waste water is critical to reduce dependence on groundwater abstraction.

Over the years, a regulatory framework has been put in place establishing, requirements for the strict management of farm waste on farm, to limit emissions, soil and water contamination as much as possible.

Weaknesses

Poor water status and severe water challenges including groundwater exhaustion and salination, coupled with rapid run-off into the sea of Malta's natural rainfall, due to increased soil-sealing development and limited active rainwater harvesting infrastructure.

Relatively low levels of technical awareness and capacity or motivation to act among part-time land- based farmers is a key obstacle to more efficient use of basic resources of water and soils in Malta. In the Agricultural policy (2017), the SWOT analysis concerning water resources describes how a lack of confidence in the acceptability of New Water by 'a conservative farming community', along with unwillingness to invest in new technologies due to both poor returns to producers, and lack of technical awareness, hinder the achievement of

more efficiency in agricultural water use in Malta. Some farmers continue to over-apply fertilisers to soil to avoid under-nourishment, without sufficient consideration of the longer-term negative environmental impacts. [111]

There has been limited awareness and investment in the quality and ecological status of soils, including in its carbon content, which poses a limit on soil quality.

A lack of interest and/or imperative to invest in more efficient water, farm input and wastes infrastructure, among processors and distributors, will also hinder the capacity of farmers to act alone or with only limited public support, in these domains.

Land ownership and use pattern creates fragmented agricultural holdings which further limits economies of scale, increases costs of production, lowers profitability and and lowers of resource use efficiency.

Traditional field level water collection and distribution systems are not sufficiently maintained, requiring restoration and upgrade in order to improve the collection of run-off rain water.

In some instances, gaps remain in the management of livestock waste on agricultural holdings, which increases the risk of nitrate pollution in ground water.

Opportunities

At a collective or industry-wide level, there is scope for government to work actively with the main sectors producing the highest sources of threat to water and soil – notably livestock manures, and chemical fertilisers in vegetable farming – on action plans which identify and develop proposals for the whole supply chain, to assist in more efficient use of water and farm inputs and enhanced soil management.

There are also opportunities to reduce use of inputs such pesticides and plant protection products. Better targeting of the application of such products not only contributes to a better environmental outcome but can help reduce the holding's expenditure on such products, therefore also improving the profitability of the holding.

There are further opportunities for more investment in enhanced re-use of treated urban wastewater and zero-carbon desalinated water and continued supply of water distribution network, that can be used in agriculture to replace use of scarce ground and surface water resources.

Farmers can be encouraged to go further in learning about and applying new techniques to reduce input use, with regards to both pesticides and fertilizers, without compromising output

[111] As reported in Dwyer et al, 2015 (Towards a new agricultural strategy for Malta), based on extensive stakeholder interviews.

value or quality, if those who buy or market their products also confirm that these practices are important to ensure a strong and successful market profile and performance. This represents a key marketing opportunity for Maltese food sector actors and an opportunity to reduce negative impact on soil and ecosystems

Reduce use of pesticides and plant protection products that cause detriment to soil content and ecosystems

Investments in enhanced re-use of treated urban wastewater and zero-carbon desalinated water and continued supply of water distribution network, that can be used in agriculture to replace use of scarce ground and surface water resources[1]

There are also opportunities to shift towards innovative and more environmentally friendly technologies, and an increasing awareness to innovate and learn the latest techniques and farming methods, particularly among young farmers. There is therefore scope to establish demonstration sites and farms, to help improve practices, demonstrate innovative technologies and disseminate best practices.

Collaborative action among farmers can help improve efficiency of resource use, thereby loweringproduction costs and improving profitability of the holding.

Possible opportunities to enhance efficiency also include agricultural waste streams that can be treated and utilised as waste to energy, in line with the circular economy, climate and environmental measures as mentioned in the EU's Green Deal and Farm to Fork strategies, to reduce soil and groundwater pollution[112]

Threats

The effects of climate change may lead to increased constraints on the natural environment such as desertification, storm water runoff, overuse of pesticides and soil erosion that may lead to depletion of soil nutrients and lower the quality of soil, whilst pressures on scarce water resources may continue to become more acute in view of drought.

The possibility of more stringent future regulations on nitrates and contaminants in water could mean that certain current agricultural systems become unsustainable, Such new regulations can also become an opportunity for the sector to shift to more sustainable practices, with the support of training, advice and investment opportunities.

Overuse of pesticides negatively impacts the quality of groundwater resources since leaching from the soil results in the pollution of such water resources.

Implications for needs and the case for intervention

In recent years, much has been achieved in respect of new policies and commitments in this domain, but there remains a need for significant intervention to enhance and restore Malta's water resources and improve the quality, protection and nutrient status of its soils.

Malta's CAP can help to support the essential shift away from inefficient fossil fuel-based farming systems and towards more efficient harnessing and use or re-use, of soil and water resources. The EC Strategic Objectives briefing note on soils highlights three specific types of 'gap' (in respect of adopting more precision agriculture to improve soil protection and efficiency) that the policy can address, all of which are relevant, in Malta:

- Knowledge gap: farmers lack the tools or the context to analyse their own data and are mostly unaware of the extent to which their data could be stored, traded and analysed for future use.
- Application gap: small or less educated farmers may be unable to keep up with new technologies. Therefore, having independent advisory services in place with sufficient digital knowledge and access to the data is very important. There is a need to develop adapted solutions for small farms. There is still a high need for incentivising innovation, to better tailor precision agriculture technologies to farmers' needs.
- Perception gap: the high start-up costs with a risk of insufficient return on investments pose challenges with accessibility and affordability. According to the 2017 Europe's Digital Progress Report, 44% of the EU population and 37% of the workforce had 'insufficient' digital skills in 2016. Malta is relatively advanced in its digital connectivity and economy, but the agriculture sector is anticipated to be less digitally literate than many other sectors.

Key measures to address these gaps and achieve enhanced practice will include both EAGF and EAFRD opportunities, such as:

- Continued use of conditionality to encourage farmers to undertake soil and water audits and assessments on a regular basis, among all farmers who produce crops for sale or processing;
- Training and advice to raise farmers' awareness and capacity to act effectively to reduce water use and minimise water pollution by nutrients, wastes and pesticides;
- Support the conversion to organic farming and shifts to lower input systems of production (adopting agroecology principles and technical innovations);
- Eco-schemes and land-based management commitment support to promote integrated crop management and enhanced soil and water management practices that go beyond the regulatory baseline, as part of regular farm management activities.

In pursuit of a strengthening of the AKIS in Malta, training, advice and demonstration are likely to be key elements in support, which can be required under EAGF measures under conditionality obligations and supported through the implementation of eco-schemes, and also

supported via the Farm Advisory System and funded via EARDF measures related to training, advice and cooperation, tailored carefully to the particular needs and capacities of Malta's different farm sectors.

A holistic approach which strengthens the whole AKIS in Malta, will be an important feature of the CAP strategy. This needs to ensure that all farmers have ready access to qualified advisers (using the advisory measure of the EAFRD where necessary), who are skilled in soil and water protection techniques and assessment; also the strategy should offer targeted training (under the training measure of the EAFRD and planned with farmers' organisations wherever possible), to encourage adoption of precision techniques to help enhance soil and water conservation and reduce or re-use wastes. It should also establish examples on Maltese farms to demonstrate (using the knowledge transfer measure) the improved impacts on business performance of enhanced efficiency in resource use; and it should support farmers and researchers to experiment together in order to identify how best to apply efficiency techniques and approaches in the Maltese context, through the cooperation measure.

Key intermediary bodies including education bodies and the Farm Advisory Service in Malta should be closely involved in developing this holistic approach, in partnership with government, independent researchers and farmers' organisations in the different production sectors.

In addition, new investment to raise standards of rural water infrastructure provision, particularly to reach as-yet inaccessible farmland areas with New Water supplies, also to enable greater efficiency and re-use of water on-farm and in food processing and manufacture, will continue to be an important feature of CAP policies in Malta. Such investments will be supported through EAFRD interventions featuring off farm investments in infrastructure that will benefit the wider agricultural community. At a holding level, there is still scope for investments in rainwater capture infrastructure, such as water reservoirs. Physical investments will build on state-aid schemes provided for farmers and producers, aimed at mitigating the impact of COVID-19 on the agricultural sector.

Thus the needs for this SO are:

5.1 Provide training and advice to increase awareness on the efficient management of natural resources

5.2 Ensure adequate treatment of farm waste to reduce groundwater pollution

5.3 Introduce Mechanisms and processes that convert agricultural waste to fertilizer

5.4 Increase efficient use of water and soil by restoring geographical and landscape features

5.5 Encourage farmers to invest in efficient farming systems that make efficient use of resources

5.6 Demonstrate the value to farm profitability of crops and livestock produced to higher standards

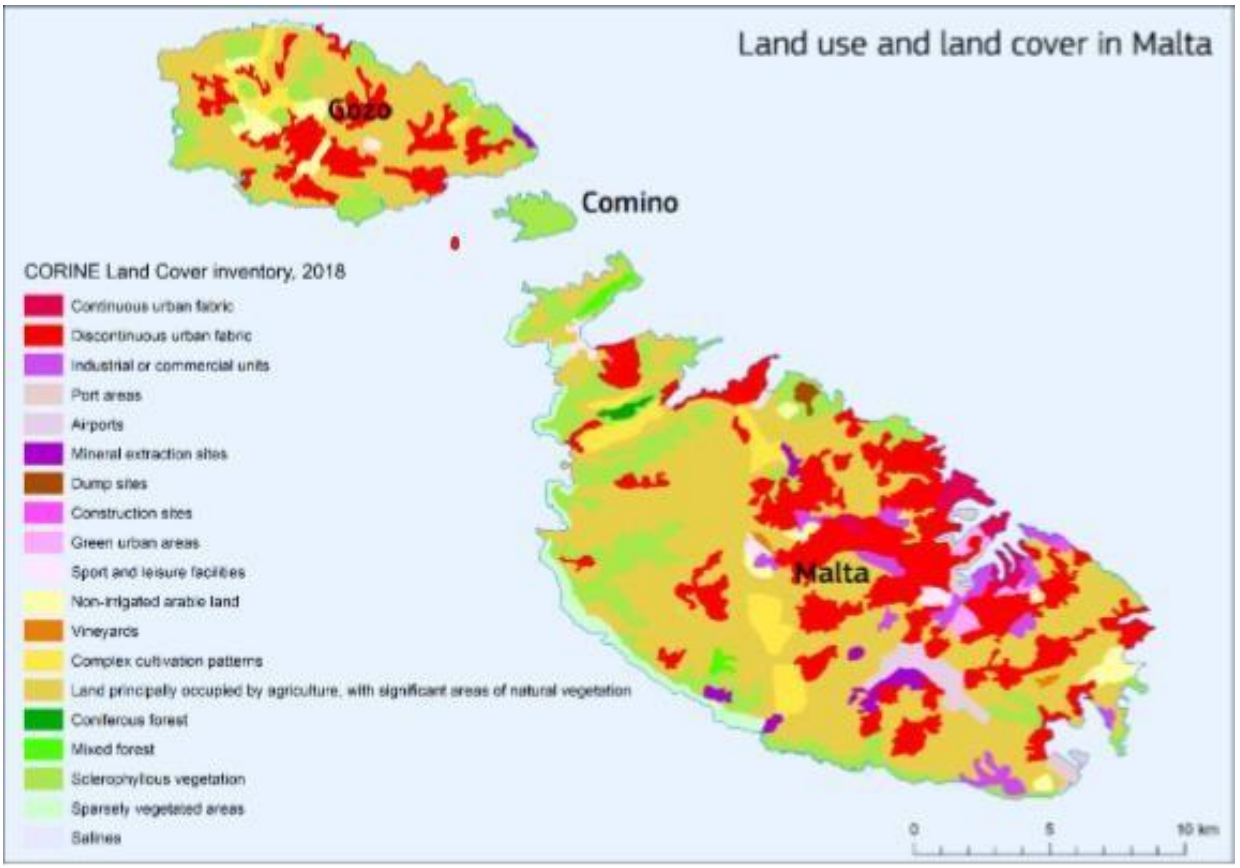
5.7 Identify ways to reduce nutrient loading to air, soil and water from agricultural activity.

Specific Objective 6: Contribute to halting and reversing biodiversity loss, enhance ecosystem services and preserve habitats and landscapes.

Context and evidence

Malta has a unique landscape which is characterised by its small size and limited natural resources aswell as a high degree of urbanisation and the highest population density of any member state in the EU. Malta's biodiversity is threatened by a variety of pressures. Habitats and species are exposed to the pressures and threats relating to development, construction and use of residential, commercial, industrial and recreational infrastructure and areas, threats from alien and problematic species and natural processes (excluding catastrophes and processes induced by human activity or climate change) and extraction and cultivation of biological living resources (other than agriculture and forestry), as well as operation of transport systems.

Figure 6.1 Land use and land cover in Malta, Gozo and Comino



Source: CORINE Land Cover inventory 2018

The National Biodiversity Strategy and Action Plan (NBSAP) aims at providing strategic direction on the management and protection of biodiversity, and it drives the integration of biodiversity concerns into relevant sectoral and cross-sectoral plans, programmes, and policies. Malta adopted its first NBSAP in 2012, covering the period to 2020. It included targets that contributed towards EU and global targets to reduce pressures on biodiversity. Malta's second NBSAP for the period to 2030, which is currently being developed, builds

upon Malta's first NBSAP and its final review of progress, in order to continue the Government's long-term efforts to manage and protect biodiversity. The updated version of the NBSAP will include measures to integrate biodiversity aspects in the agricultural sector, while operating in synergy with the present policy.

- Enhancing implementation

The 2018 State of the Environment Report notes that Malta's biodiversity continues to experience numerous threats and pressures from natural biotic and abiotic processes, invasive and other problematic species, human interference, geological events, and natural catastrophes. On the conservation status of habitats and species of Community importance, Malta has reported that 53% of the species and 28% of habitats have good conservation status, showing an improvement over previous years that can be attributed to new knowledge and improved interpretation.[113] However 24% of species and 72% of habitats do not have a favourable conservation status, and hence require enhanced conservation action.[114]

Local biodiversity can be found in both rural and urban environments – numerous species exist in farmland and villages, including mammals, birds, reptiles, and invertebrates. Biodiversity and agriculture are closely linked, for example, soil organisms are very important for the maintenance of good soil structure and fertility and wild pollinators are essential for the development of crops. Certain species rely on agriculture for the provision of food (e.g. farmland birds), whereas other species rely on agricultural landscape features, such as rubble walls, as their habitat.

Despite covering a small share of local agriculture, beekeeping in the Maltese Islands has always had an invaluable role within the Maltese agricultural community [115]. Promoting biodiversity and supporting local ecosystems and the species which reside within these systems, while focusing also at bee health have been the main aim of Malta's Apiculture programme and support offered via RDP measures. According to the National Agricultural Policy (2018) "*the geographical insularity of Malta in the centre of the Mediterranean has isolated the local bee species from other bee populations around the Mediterranean littoral with the result that there is the endemic sub-species Apis mellifera ruttneri (Sheppard WS et al, 1997) that has, over the years developed resistance and resilience to the particular climatic conditions prevalent in these islands. This endemic sub-species of honeybee is known to have inhabited the Maltese Islands for centuries. It is a sub-species of the Western honeybee or European honeybee (Apis mellifera), but is different from other Mediterranean bees. Up to recent times, it was the sole honeybee species in the Maltese Islands (Attard E. and Bugeja Douglass A., 2010)".* Bees are important pollinators of mainstream crops and orchard fruits as well as colonisers of many garigue areas. These beneficial aspects of garigue landscapes act as

[113] State of the Environment Report 2018, Summary Report, SoER-Summary-Report-2018.pdf (era.org.mt)

[114] Malta's National Biodiversity Strategy Action Plan 2012-2020, https://era.org.mt/en/Documents/MaltaNBSAP_2012-2020.pdf

[115] Malta National Apiculture Programme, 2020-2022, https://ec.europa.eu/info/system/files/food-farming-fisheries/animals_and_animal_products/documents/nap-mt_mt.pdf

a persuasive motive for protecting and conserving this unique and vastly biodiverse habitat[116].

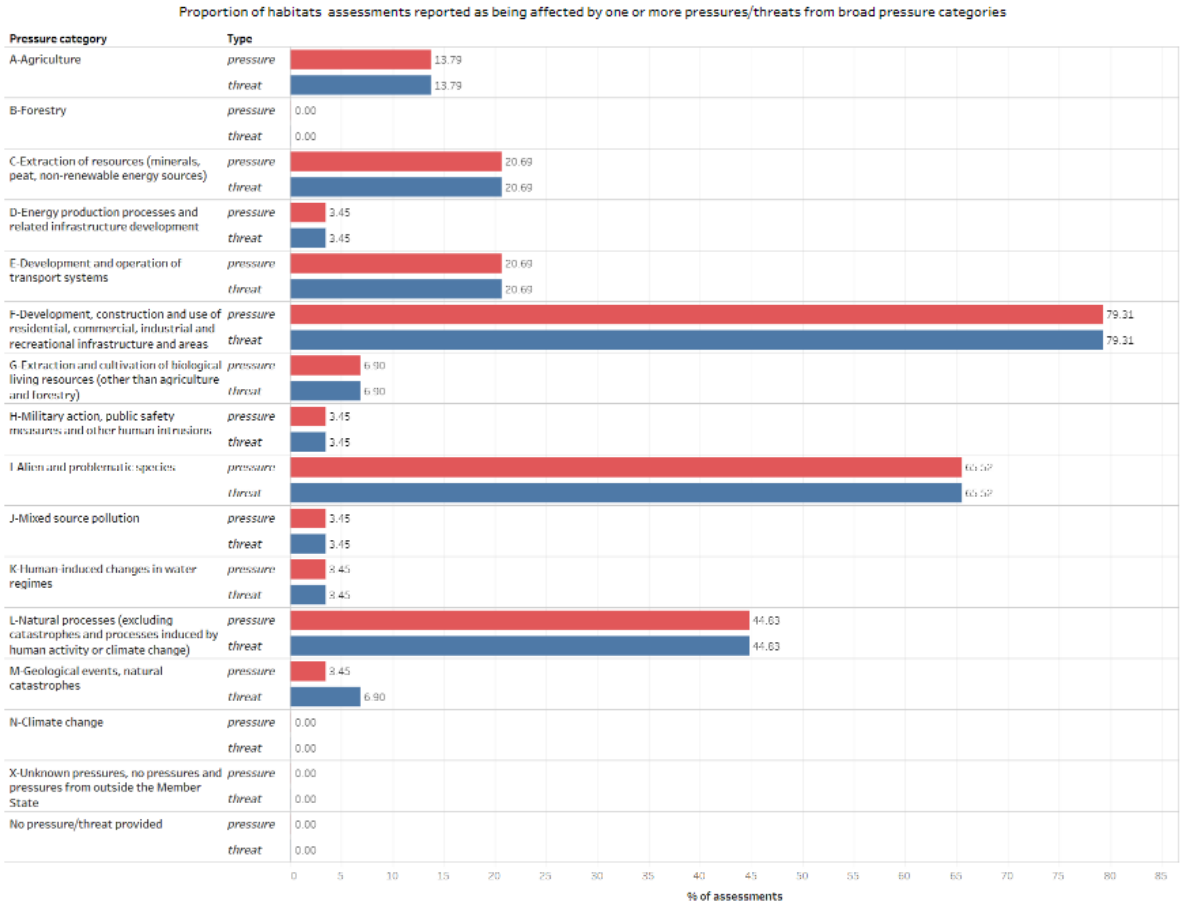
The State of the Environment Report suggests that the pressures and threats that most often affect habitats and species are pressures and threats relating to development, construction and use of residential, commercial, industrial and recreational infrastructure and areas, threats from alien and problematic species and natural processes, extraction and cultivation of biological living resources, as well as operation of transport systems. alien and problematic species. Although agriculture poses a pressure and a threat to both habitats and species, its impact is not as significant as other categories; nevertheless, steps should be taken to reduce this source of impacts.

Malta's National Strategy for Preventing and Mitigating the Impact of Invasive Alien Species (IAS) in the Maltese Islands, highlights the detrimental effects of invasive alien species on Malta's biodiversity, that can also have adverse implications for agriculture. Agriculture may be one pathway through which invasive species are introduced, either intentionally if the species are used as a crop or an ornamental plant, or unintentionally, for example through trade. Deliberate introduction generally occurs without good knowledge of the long-term consequences. The Strategy introduces measures that encourage the eradication of IAS pathways as well as good agricultural practices that can avoid the accidental spread of IAS [117].

[116] National Agricultural Policy for the Maltese Islands 2018-2028 Parliamentary Secretary for Agriculture, Fisheries and Animal Rights, ttps://agrikoltura.gov.mt/en/agricultural_directorate/Documents/nationalAgriculturalPolicy/napFinal.pdf

[117] ERA, National Strategy for Preventing and Mitigating the Impact of Invasive Alien Species (IAS) in the Maltese Islands, 2018, https://era.org.mt/national-strategy-for-preventing-and-mitigating-the-impact-of-invasive-alien-species-ias-in-the-maltese-islands/

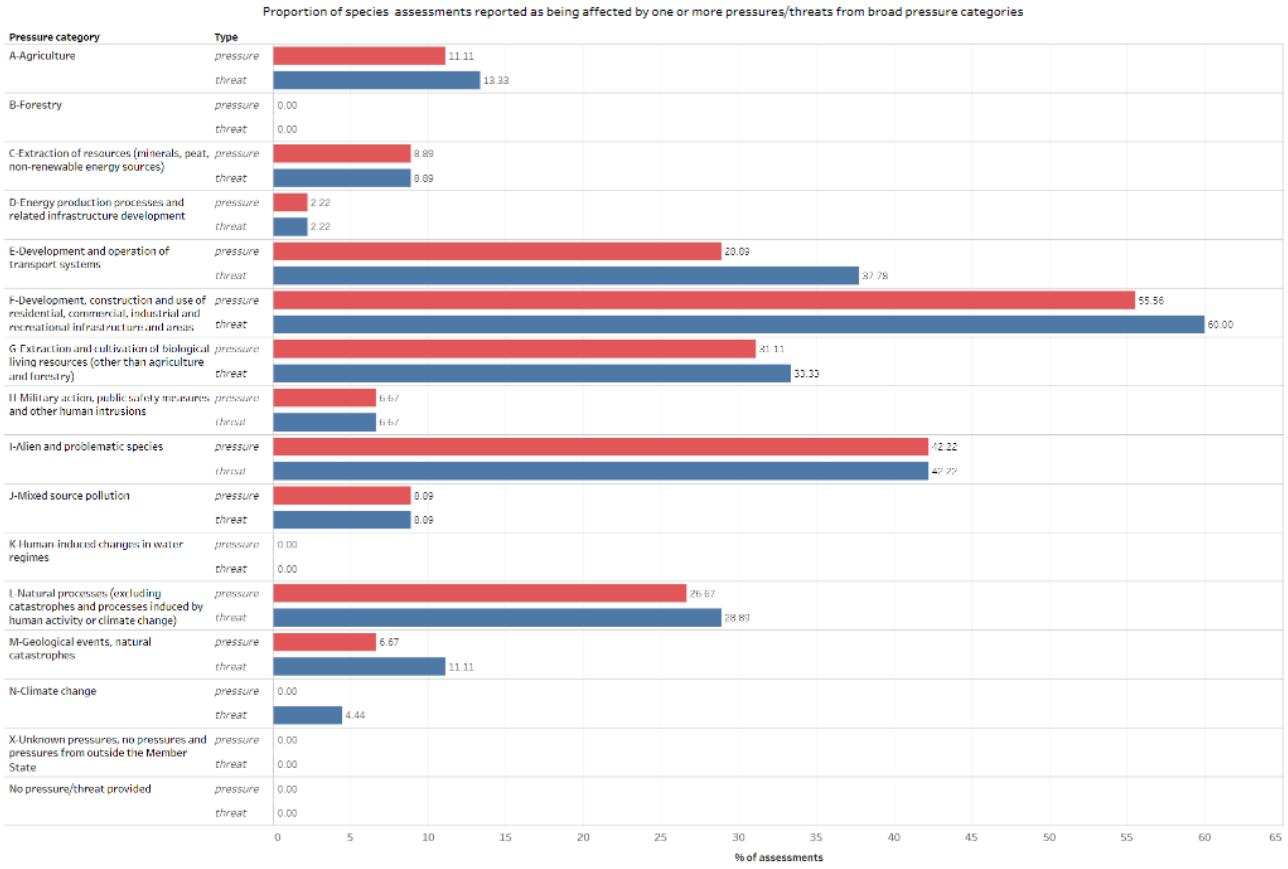
Figure 6.2 – Frequency of significant pressures and threats for Malta's priority habitat assessments



Source: EEA, Biodiversity-Ecosystems, State of Nature in the EU, National Summary dashboards

- Habitats, Main Pressure and Threats

Figure 6.3 – Frequency of significant pressures and threats for Malta's important species assessments



Source: EEA, Biodiversity-Ecosystems, State of Nature in the EU, National Summary dashboard

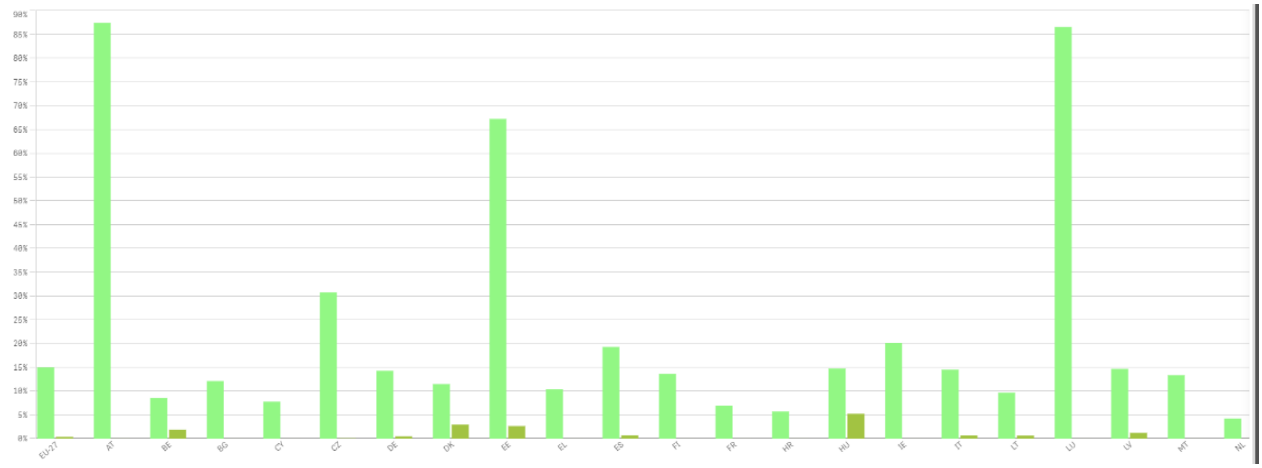
- Habitats, Main Pressure and Threats

Improved countryside management has been pursued through the designation of protected areas and the establishment of Natura 2000 site management plans for all terrestrial Natura 2000 sites, in line with the Habitats Directive, whose drafting was funded through the 2007 – 2013 Rural Development Programme. Also, there are ongoing afforestation initiatives and other initiatives to promote rare indigenous, endemic and other tree species that are well adapted to the local climate, identifying 30 tree protection areas (TPA's) and seeking to improve Malta's tree and woodlands protection regulations. In 2018, 13% of agricultural land was under relevant agri-environment contracts (Figure 6.4), which is just under the EU27 average share. The total number of TPAs over the Maltese Islands are now 60, of which 48 are in Malta, 10 are in Gozo and 2 are in Comino.

Natura 2000 sites have a critical role for conserving nature by affording protection to habitats and species of wild fauna and flora of Community interest. This is done through the establishment and implementation of conservation objectives and measures that ensure that

the condition of the natural habitats and species, which are of particular importance, are maintained and/or restored in order to ensure their long-term survival.

Figure 6.4 Share of land under contracts supporting biodiversity and/or landscape and forest (%),EU28, 2018[118]



To date, Malta has four proposed Sites of Community Importance (pSCIs), 13 Sites of Community Importance (SCIs) and 27 Special Areas of Conservation (SACs) declared under the EC Habitats Directive (92/43/EEC), together with 22 Special Protection Areas (SPAs) declared under the EC Birds Directive (2009/147/EC), that include both terrestrial and marine sites[119]. Over 43.6km^2 (13%) of the land is covered by Natura 2000 sites while marine sites cover 4,138km^2 (35.5% of Maltese waters).[120]

Eight Natura 2000 sites are managed by NGOs to tackle management issues in line with the respective Natura 2000 plan, in relation to, for example, the control or removal of invasive alien species and habitat restoration. NGOs are also increasing public awareness through various activities.[121]

The Environment and Resources Authority (ERA) set out in December 2016[122] the ecological priorities for the management of all Malta's land-based Natura 2000 sites; 22 management plans and 8 conservation orders have been prepared, which cover a variety of sites including coastal cliffs in Malta and Gozo, sand dunes such as Ramla, saline marshlands such as il-Ballut ta' Marsaxlokk, woodland areas like Buskett and other islands, including Filfla and Kemmuna and their surrounding islets [123].

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[118] Biodiversity (EU 27) European Union 27 (excluding UK); https://agridata.ec.europa.eu/extensions/DashboardIndicators/Biodiversity.html?select=EU27_FLAG,1

[119] Natura 2000 in Malta, Environment and Resources Authority. HYPERLINK "https://era.org.mt/topic/natura-2000-in-malta/"https://era.org.mt/topic/natura-2000-in-malta/ Accessed on 1/08/2022

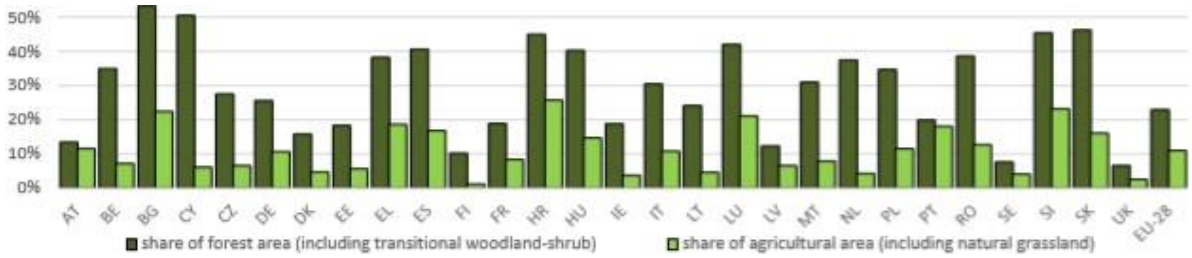
[120] Environment and Resources Authority, Natura 2000 in Malta: https://era.org.mt/management-plans-for-terrestrial-natura-2000-sites-in-malta-gozo (accessed 17 April 2020).

[121] State of the Environment Report 2018, Summary Report, https://era.org.mt/wp-content/uploads/2019/05/SoER-Summary-Report-2018.pdf

[122] Management Plans for Terrestrial Natura 2000 Sites in Malta & Gozo: https://era.org.mt/management-plans-for-terrestrial-natura-2000-sites-in-malta-gozo (accessed 17 April 2020).

[123] Currently the ERA is revising the management plans including the conservation objectives and measures for all habitats and species.

Figure 6.5 Area under NATURA 2000



Source: NATURA 2000 Barometer Statistics Reports, NATURA 2000 data and CORINE Land Cover (CLC)

These policy documents outline the need to safeguard the ecological qualities of each area, such as ecological restoration, regulation of certain activities, visitor management and site interpretation, sustainable rural tourism and recreation, public awareness initiatives, patrolling and monitoring. [124] In this regard and building upon the investment made under the 2014-20 programming period, Government aims to continue supporting investment in Natura 2000 sites by increasing conservation measures, habitat restoration, planting of indigenous plant and tree species, introducing climate mitigation actions to counteract soil erosion, drought and flooding as well as coastal erosion, and monitoring the pathways of invasive alien species, amongst other actions.

In line with Article 8 (1) of the Habitats Directive, Malta has developed a Prioritized Action Framework (PAF). The PAF serves as a strategic multiannual planning tool, aimed at providing a comprehensive overview of the measures that are needed to implement the Natura 2000 network and its associated green infrastructure, specifying the financing needs for these measures and linking them to the corresponding EU funding programmes. The measures contained in Malta's PAF reflect the terrestrial Natura 2000 site management plans and the developing marine Natura 2000 site management measures in synergy with other plans and priorities under related policies. The development of all of these plans and programmes involves or has involved consultation with relevant stakeholders, providing a number of routes for stakeholders to influence the management of and priorities for the Natura 2000 network in Malta.

Agricultural practices have a substantial impact on Natura 2000 sites and countryside management in Malta, although only 8% of agricultural land in Malta is designated under Natura 2000, compared to the EU-27 figure of 11%.

The Management Plans for the terrestrial Natura 2000 sites indicate some of the main threats to these areas, include farmers' limited knowledge about the significance of Natura 2000 sites. There is scope for training and advice to ensure better coexistence of agricultural practices within N2000 sites. The management plans identify practices that are harmful to ecosystems, providing clear indications for government action to reduce or eliminate such practices and

[124] ERA launches 30 Management Plans and Conservation Orders for Malta's Terrestrial Natura 2000 sites, Press Release https://era.org.mt/en/Pages/Press-Release-MPs-and-COs.aspx

support better management of such areas.[125]

In relation to Ecosystem Services, some of Malta's most vulnerable regulating services are those provided by water and soils – namely hydrological cycling and carbon storage, which are also considered in Specific Objectives 4 and 5. Other important services include pollination, supported byactions to preserve Malta's floristic diversity and insect life, including wild bees; and cultural serviceswhich relate to the protection and enhancement of the historic and scenic features of the Maltese rural landscape.

Malta's Low Carbon Development Strategy[126] favours further incentives for the development of organic farming that will reduce emissions related to pesticides and fertilisers. The European Commission's Farm to Fork Strategy sets ambitious targets for an increase in agricultural area under organic practices and a reduction in the use of pesticides and artificial fertilizers.[127] There is scope for continued support to organic producers and the promotion ofsuch practices, with the aim of increasing the percentage of land being managed through organic practices. Maltese agricultural land reform needs to be tackled to make parcels of land more productive and efficient at lowest possible carbon cost.

Malta's second National Action Plan (NAP) for the sustainable use of pesticides has six main objectives[128]:

- Training, information and awareness-raising for farmers;
- Controls on pesticide application equipment;
- Controls on handling, storage and disposal;
- Controls on pesticide usage in specified areas;
- IPM and alternative low pesticide management; and
- Risk indicators and data gathering.

In 2020 Malta was recorded as having a total of 11,402 ha of agricultural land, of which 10,730 ha was Utilized Agricultural Area (UAA), while unutilised agricultural area and other areas made up 672 ha. Arable land accounted for 7,782 ha of the total UAA, while permanent crops and kitchengardens were 953 ha and 1,995 ha respectively[129]. There is no recent data and information on agricultural pesticide use in Malta, with the most recent information reported in the 2007 and 2010 NSO surveys. From these, it appears that:

- The majority of Malta's utilised agricultural area (5,077.6 hectares or 62.7% of the area

  surveyed in the 2010 land cover survey) is regularly treated with pesticides (NSO,

[125] ERA, Natura 2000 Management Planning for Terrestrial Sites in Malta & Gozo https://era.org.mt/en/Pages/Natura-2000-Management-Planning.aspx

[126] Malta, Low Carbon Development Strategy, October 2021, https://unfccc.int/sites/default/files/resource/MLT_LTS_Nov2021.pdf

[127] EURACTIV, LEAK: EU's Farm to Fork Strategy will be based on five key targets, https://www.euractiv.com/section/agriculture-food/news/leak-eus-farm-to-fork-strategy-will-be-based-on-five-key-targets/ (accessed 06 March, 2020).

[128] MCCAA, Public Consultation Feedback Report on Malta's National Action Plan on the Sustainable Use of Pesticides 2019-2023; https://meae.gov.mt/en/Public_Consultations/MJCL/Documents/NAP%202019-2023%20Public%20Consultation%20Feedback%20Report%20-%20MCCAA.pdf

[129] NSO, News Release, Census of Agriculture 2020, 1 February 2022 https://nso.gov.mt/en/News_Releases/Documents/2022/02/News2022_015.pdf

2010)[130], most commonly fungicides;

- At the time of the most recent detailed survey of usage, these are mainly applied using knapsack sprayers (NSO, 2007)[131];
- The quantities of pesticides applied per hectare are high (NSO, 2007 – on average, 5.6 Kg/ha;by crop type, Table 6.1).

Pesticide sales in Malta show substantial variation, being highest for fungicides and bactericides and other plant protection products as presented in Table 6.2.

All distributors and professional users of pesticides are required to undertake training, and use is restricted in sensitive sites including Natura 2000 areas and buffer zones (Malta NAP for Sustainable Use of Pesticides 2013 – 2018)**.**

Table 6.1 Amounts of main types of pesticides used on UAA in Malta, 2007

Acaricides	< 0.1 kg/ha
Fungicides	Vegetables (open field): 28.7 kg/ha
	Potatoes: 0.7 kg/ha
	Vines: 2.1 kg/ha
Herbicides	1.2 kg / ha
Insecticides	0.3 kg/ha

Source: NSO Plant Protection Products usage on crops in Malta survey (2007)

Table 6.2: Pesticide sales Malta (kg)

Year	**Fungicides andBactericides**	**Herbicides, haulm destructors, mosskillers**	**Insecticides andacaricides**	**Molluscicides**
2011	95,040	6,223	4,377	911
2012	124,625	7,959	4,710	400
2013	122,070	7,006	5,131	515
2014	97,370	7,632	4,406	480
2015	118,644	4,748	4,449	699
2016	83,523	5,609	4,972	412

[130] Census of Agriculture. National Statistics Office, 2010; https://nso.gov.mt/en/publicatons/Publications_by_Unit/Documents/B3_Environment_Energy_Transport_Agriculture_Statistics/Census_ of_Agriculture_2010.pdf.

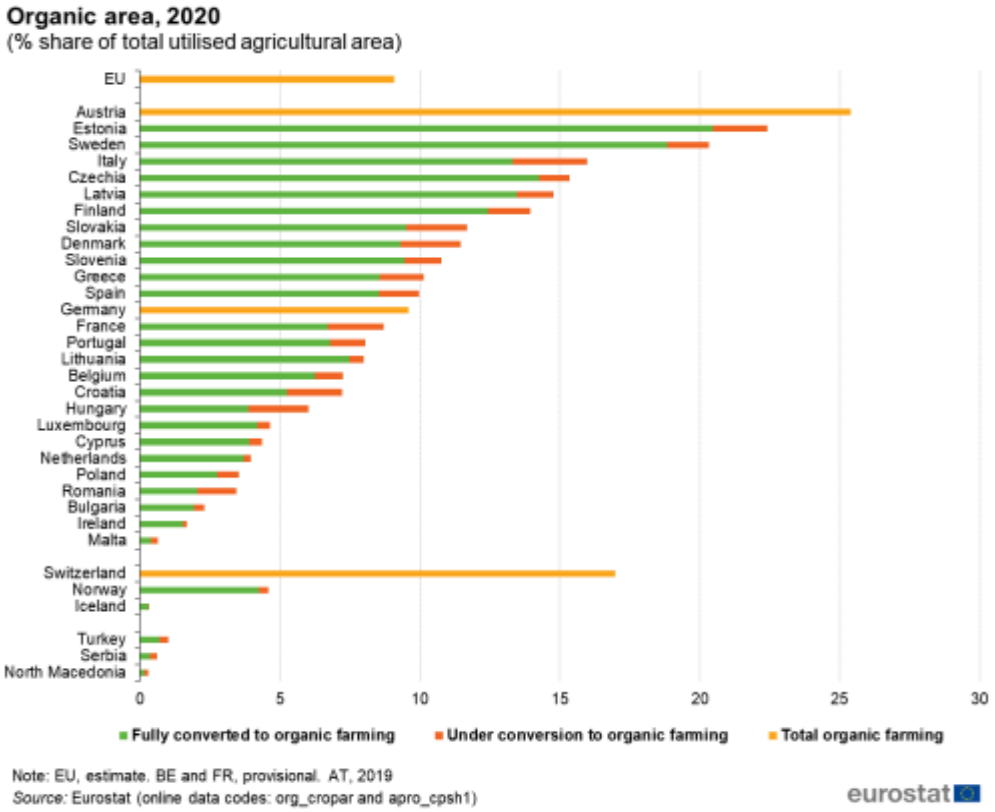
[131] Plant Protection Products Usage on Crops in Malta. National Statistics Office, 2007; https://nso.gov.mt/en/publicatons/Publications_by_Unit/Documents/B3_Environment_Energy_Transport_Agriculture_Statistics/Plant_Pr otection_Products_2007.pdf.

2017	101,943	2,244	3,078	235
2018	82,509	3,247	3,492	753

Source: Eurostat https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do

The NAP highlights the importance of providing advice on ways to reduce dependence upon pesticidesand support to encourage conversion to organic farming. The farmed area with low input intensity increased between 2004 and 2016 from 15% to 19%, whereas the area with high input intensity decreased from 67% to 61%, where intensity is defined as the level of farm inputs used per hectare ofland.

Figure 6.6 Organic share of total utilized agricultural area.



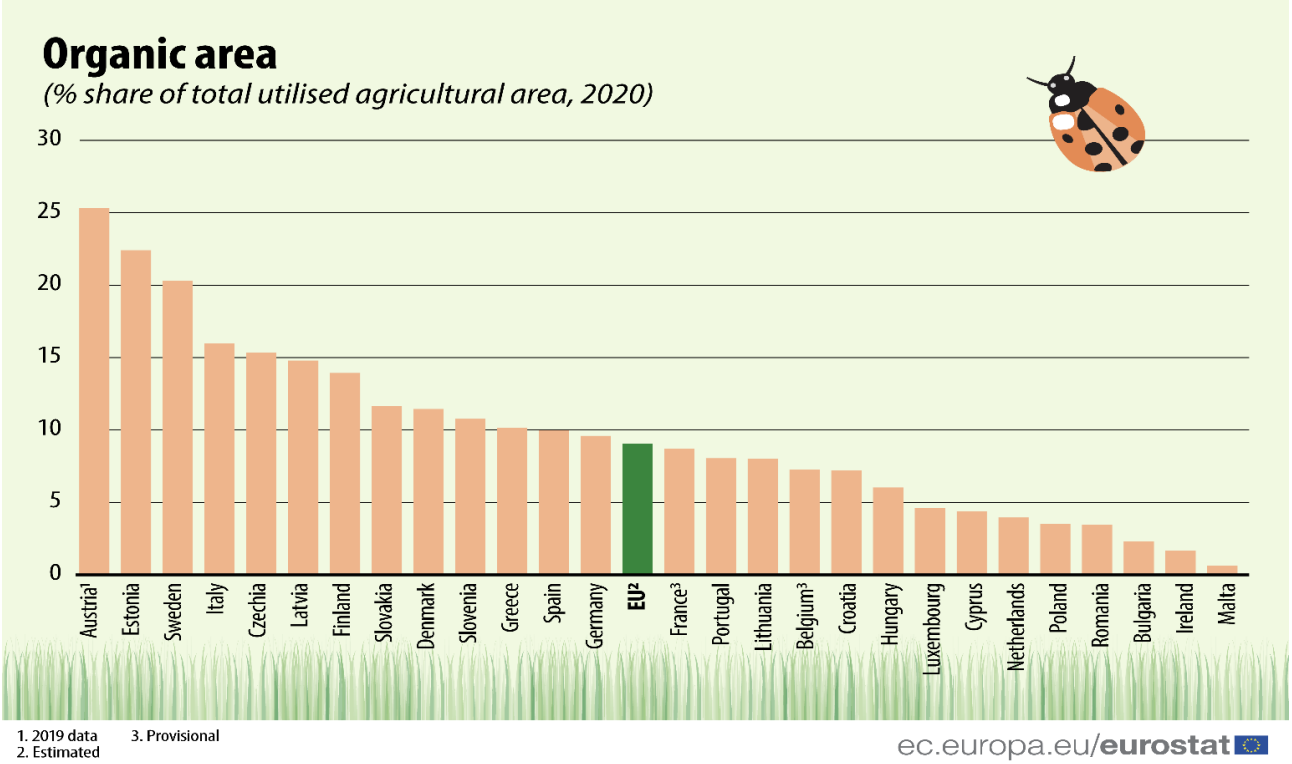
Source: EUROSTAT

However, at present, only around 24 [132] of Malta's approximately 10,000 farms are registered as organic or in conversion to organic production. Figure 6.6 shows the share of organic area in 2020 in the EU, with Malta's share being less than 0.4 % for UAA being fully converted to organic farming, and UAA under conversion to organic farming. Whereas the trend in the EU is upwards, the number of organic hectares in Malta remains very low (Figure 6.7). Nevertheless, the fact that there are somesuch producers now, represents a significant growth

[132] Register of Operators Certified under EU REG 834/2007, available at: https://mccaa.org.mt/media/7551/organic-operators-as-at-15-07-2022.pdf

in this sector since the previous programming period.[133]

Figure 6.7 Total area under organic farming 2020



Source: EUROSTAT

The area under organic practices in Malta grew from 24ha in 2016, to 47ha in 2018 and then reaching a total of 67ha in 2020 (of which 41ha are fully converted to organic agriculture, 26ha were under conversion in 2020).[134] Despite this, Malta still has the lowest share of total organic area in total Utilised Agricultural Area (UAA) across the EU, at 0.4%.[135] Malta's preliminary and indicative target for agricultural land under organic farming by 2030 is 5%. The actual target will be determined by the National Organic Action Plan which is foreseen to be finalised by mid-2023.

The National Agricultural Policy identifies the perceived 'strict, complex and long process for obtainingorganic status' as a deterrent to farmers considering organic farming.

The National Agricultural Policy also lists a number of difficulties that are encountered by organic farmers including land fragmentation, proximity to conventional farmers, windy

[133] MCCAA, Organic Farming Certification, https://mccaa.org.mt/Section/Content?contentId=1252.

[134] Eurostat, Organic crop area by agricultural production methods and crops: https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do (accessed 20 April 2020)

[135] Eurostat 2020, Organic Farming Statistics: https://ec.europa.eu/eurostat/statistics-explained/index.php/Organic_farming_statistics (accessed 20 April 2020)

conditions leading to pesticide drift, and poor soil conditions. Organic farming demands a shift in production and a customer-oriented approach and does not simply involve replacing chemical substances with biological methods – it should imply a change in farm management that needs to take place over a period of time. Organic farming certification, although perceived as complex, follows a well-organisedprocess from registration, controls and testing carried out by the MCCAA to market surveillance by the Agriculture Directorate, that acts as the competent Authority. Organic products are therefore backed by a regulatory framework that is well monitored and enforced.

Malta's food and nutrition policy seeks to educate Maltese consumers in order to increase knowledgeabout and demand for healthy food products, and the demand for organic produce in Malta is slowlygrowing, and there is therefore room for this sector to develop further.

Strengths

The Maltese Islands host a variety of indigenous and endemic species, and a range of priority habitats distributed widely across the islands. Malta's historic landscape is considered an important cultural asset, showing the traces of many centuries of habitation, diverse uses and customs and a particularlyrich archaeology.

The garrigue and maquis represent terrestrial habitats of national and international importance for biodiversity. Given the small size of the Maltese islands there is particularly high diversity of terrestrial plants and animals present.

Significant progress in recent years has enabled Malta to achieve comprehensive management planning for its highest value protected sites and this is just starting to show results in the form of enhanced levels of favourable conservation status for designated sites under the Natura 2000 network.

All terrestrial habitats, in line with Annex I of the Habitats Directive (92/43/EEC)[1] and Schedule I of the Flora, Fauna and Natural Habitats Protection Regulations (S.L. 549.44)[2] represent terrestrial habitats of national and international importance for biodiversity

Comprehensive management planning for the highest value protected sites (Natura 2000) through existing Management Plans.

Weaknesses

Low levels of awareness of the existing and potential value of Malta's farmed landscape for biodiversity and the designated terrestrial Natura 2000 sites, among both the farming and non-farming population, is a significant obstacle to stimulating sufficient remedial actions in the sector. Inthe majority of N2000 site Management Plans, educating farmers and local people about the importanceand value of these sites is listed as a priority for action.

More generally, fragmented landholdings and a lack of upkeep of landscape features and natural resources mean that the biodiversity status of farmland is vulnerable and in decline, in many places.

Small and part-time farms often lack the training and financial incentive to engage in

biodiversity management, when their main income is earned off the farm and the time that they can devote to their holdings is limited. Meanwhile, self-employed famers running large holdings with restricted manpower may also have little incentive to engage in biodiversity measures since they have little timeto dedicate to such measures.

The high average age of the farming population may hinder the sector from moving forward towardsa more sustainable future due to the conservative nature of the older generation. This may therefore slow down the regeneration of the sector and its move towards more agroecological and more sustainable practices. Biodiversity management is not considered as an integral part of farm management, which may be a result of thelack of knowledge, training and insufficient incentives for farmers to engage in biodiversity management or organic farming.

Opportunities

There are opportunites for more awareness of Malta's distinctive biodiversity and the encouragement of activities aimed at protecting and valorising its semi-natural habitats and landscape features associated with field boundaries and channels; and to enhance appreciation of its Natura 2000 sites

In view of the need to move towards agricultural systems which are less dependent upon significant use of water, there could be opportunities to encourage expansion of permanent cropping (e.g. of tree crops like olives and almonds, or other drought-tolerant fruits), which could benefit biodiversity by enhancing soils, encouraging a more humid microclimate and providing more diverse habitat for wildlife.

The growing interest of consumers in organic products could help to increase farmers' interest in Malta to adopt more biodiversity-friendly production methods via conversion to organic farming; so long as cultural barriers to this shift can be overcome.

Threats

Limited willingness to engage with CAP support and low levels of awareness of their impact upon biodiversity are all commonly cited tendencies among very small and part-time farmers in Malta (Dwyer et al, 2015)[136], which have threatened the achievement of Malta's goals for protection and enhancement of biodiversity, particularly in the farmed landscape. Intensification of agricultural practices and lack of knowledge on Malta's biodiversity and protected areas can diminish the desired favourable status of Natura 2000 sites and their ecosystems.

Other threats include involuntary spreading of invasive alien species in the Maltese countryside through agricultural practices that can have adverse repercussions on both the agricultural sector andbiodiversity. Also, increasing population density, urbanisation and the

[136] Dwyer, J., Powell, J., Kubinakova, K. (2015) Towards an enhanced rural development programme for Malta 2014-2020: summarisingresults of stakeholder consultations and workshops. Report to Maltese government.

need for additional infrastructure, including for residential or tourism purposes, pose a further threat to biodiversity.

Instances of overuse of pesticides lead to a negative impact on biodiversity, both on the holding and in the surrounding areas.

Increasing population density, urbanisation have a negative impact on biodiversity, since habitats are taken up due to the need for additional infrastructure.

Decline of local indigenous populations and varieties for both livestock and endemic crops due to the introduction of modern breeds of livestock and hybrid plants from other parts of Europehas resulted in the decline of local indigenous populations and varieties, most of which have disappeared.

Land abandonment, over-exploitation and urbanisation also leads to the degradation of rural habitats and cultural landscapes.

Changing climate patterns may also lead to an increase in the number and variety of pests: in warmerwinters pests are likely to remain dormant for shorter periods of time while an increase in average temperature over the year may be ideal for the proliferation of new pests that are imported throughtrade but which would have otherwise died out since the local climate is not suitable. This may lead to an increasing reluctance to switch to less pesticide intensive agronomic practices. Additionally, withhigher temperatures and changing rainfall patterns, endemic species may also be affected since thereis not enough time for them to adapt.

Implications for needs and the case for intervention

Malta's biodiversity remains a priority for policy actions within and beyond agriculture, in view of its continuing vulnerability and its international importance.

A very high level of promotional activity linked to the uptake of EAGF CAP aids, also conditionality awareness, training and advice, and finally facilitation to assist farmers to come forward and sign up to EAFRD aids, are likely all to be necessary, to overcome the weaknesses and avoid the threats identified here.

Agri-Environment Climate Measures (AECM's) have registered considerable uptake during the 2014- 2020 RDP**.** During 2018, approximately 1,000 beneficiaries benefited from one of the schemes,[137] which represents about 10% of registered farms. The draft AIR 2019 will report that commitment ofplanned RDP funds under both measures 10.1 and 10.2 is above 100%. In this regard, opportunities for further support in this area are deemed important.[138]

The funded measures for environmental actions included some investment measures which were verypopular, such as the restoration of rubble walls and planting of native tree species; whilst other annualpayments initially struggled to attract uptake. Eventually, uptake was noted

[137] Annual implementation report Malta - Rural Development Programme (National) reporting year 01/01/2018 - 31/12/2018; https://eufunds.gov.mt/en/EU%20Funds%20Programmes/European%20Agricultural%20Fund/Documents/Downloads%20And%20Links/AI R/2014-2020/Annual%20Implementation%20Report_2016.pdf

[138] Values can be updated once AIR has been completed.

for every programmed AECM, to different extents. On-farm non-productive investments shall continue providing incentives for planting of trees and shrubs along field boundaries, that will encourage a better management of natural resources, and reduce soil erosion.

The new eco-scheme under CAP EAGF aids could also prove significant for Malta, which was only minimally affected by previous 'greening' measures due to the small size of most Maltese land-based farms. There is scope to use the new instrument to promote a much broader awareness and buy-in to basic biodiversity protection and enhancement, notably through adoption of lower-input or less chemically dependent modes of production.

In an effort to reduce dependency on plant protection products, there is therefore scope for support with regards to the dedication of land for biodiversity purposes, support for the setting up of an IPM on the farm, and support for the use of mechanical means for weed removal, instead of herbicides. Support for the maintenance and conversion to organic farming will also contributes towards this aim.

In order to support beekeeping, the apiculture programme is expected to provide training and information, investments related to varroasis, restocking and transhumance and support for labs, given that bees, together with other pollinators, carry out pollination of agricultural species and wildflowers, therefore they also provide services to the ecosystem.

Knowledge transfer, through training and advice, is expected to complement the requirements established in the PAF and provide farmers with the necessary skillset with regards to the protection of biodiversity. Training and advice will aim to address biodiversity loss, through for example, the reduced use of pesticides and converting to organic farming practices, amongst others.

Thus the needs for this SO are:

6.1 Promote measures that protect and enhance biodiversity on agricultural holdings and wider rural areas

6.2 Disseminate knowledge amongst farmers to safeguard biodiversity on Natura 2000 sites

6.3 Promote the removal of invasive alien species and the planting of native and archaeophytic species

6.4 Improve and conserve the status of existing habitats protected under HBD and rural landscape features

6.5 Conserve endemic species with the aim of preserving local agricultural genetic resources

<u>Specific Objective 7: Attract and sustain young farmers and new farmers and facilitate sustainable business development in rural areas</u>

Context and evidence

As was discussed under Specific Objective 1, the average land holding size in Malta is very small whencompared with the European average. This micro-farming aspect is a result of land scarcity, topography, dense population as well as inheritance patterns that result in land fragmentation.

According to the Regional Statistics Malta 2020 Edition (2020) employment (employed persons comprise of full-time and part time [primary only] employment), in agriculture, forestry and fishing has been increasing slightly from 2016 to 2018. Employment in agriculture is heavily dominated by males.

Figure 7.1 Total employed persons by industry place of residence, sex and year (NUTS3)

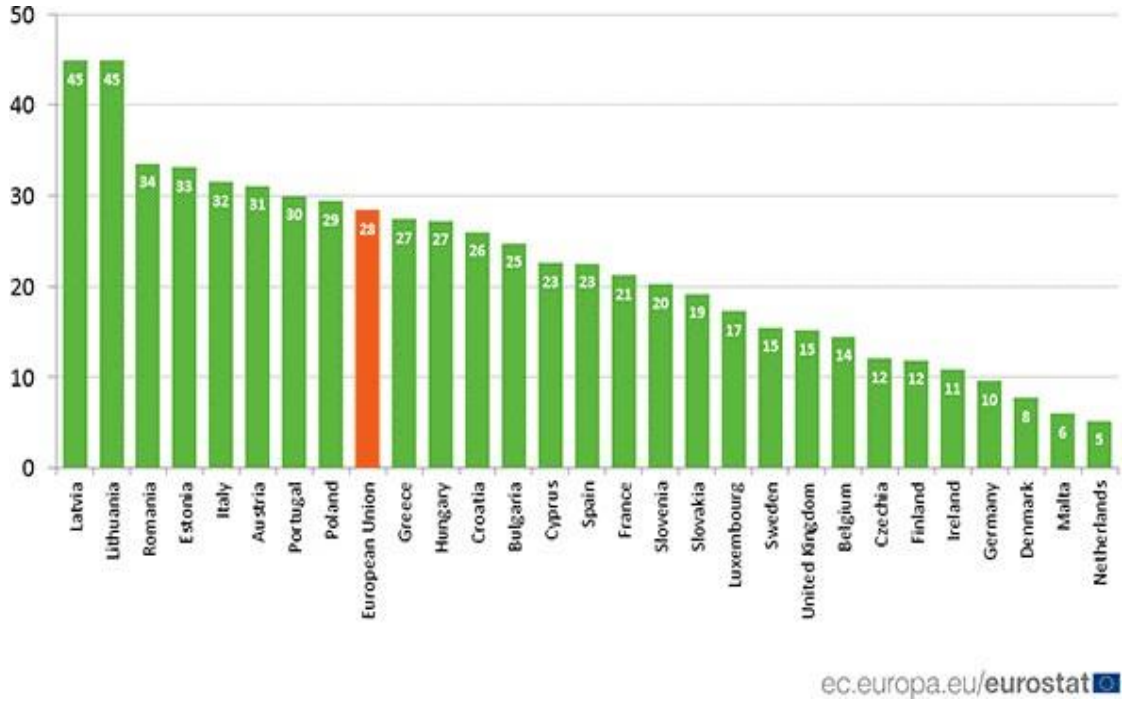
NACE Rev 2 at A*10/11			2018			2019		
			Males	Females	Total	Males	Females	Total
		MALTA	**2,858**	**466**	**3,324**	**2,997**	**496**	**3,493**
A	Agriculture, forestry and fishing	Malta	2,293	387	2,681	2,408	414	2,823
		Gozo and Comino	565	79	643	589	82	670

NACE Rev 2 at A*10/11			2020		
			Males	Females	Total
		MALTA	**3,061**	**535**	**3,596**
A	Agriculture, forestry and fishing	Malta	2,456	451	2,907
		Gozo and Comino	605	84	689

Source: Regional_Statistics_Malta-2020 Edition (2022)

The most recent data (Eurostat 2016) suggests that, on average, around 29% of farms across the EU are managed by a woman, however in Malta the share is only 6% (Figure 7.2). A thematic evaluation on the young farmers measure programmed in the RDP 14 – 20 period carried out in 2021 noted that around 82% beneficiaries of M6.1 are male while 18% are female. The proportion of female beneficiaries is higher than the ratio of total female farmers observed in 2016, implying that the measure is being successful in attracting young female farmers.

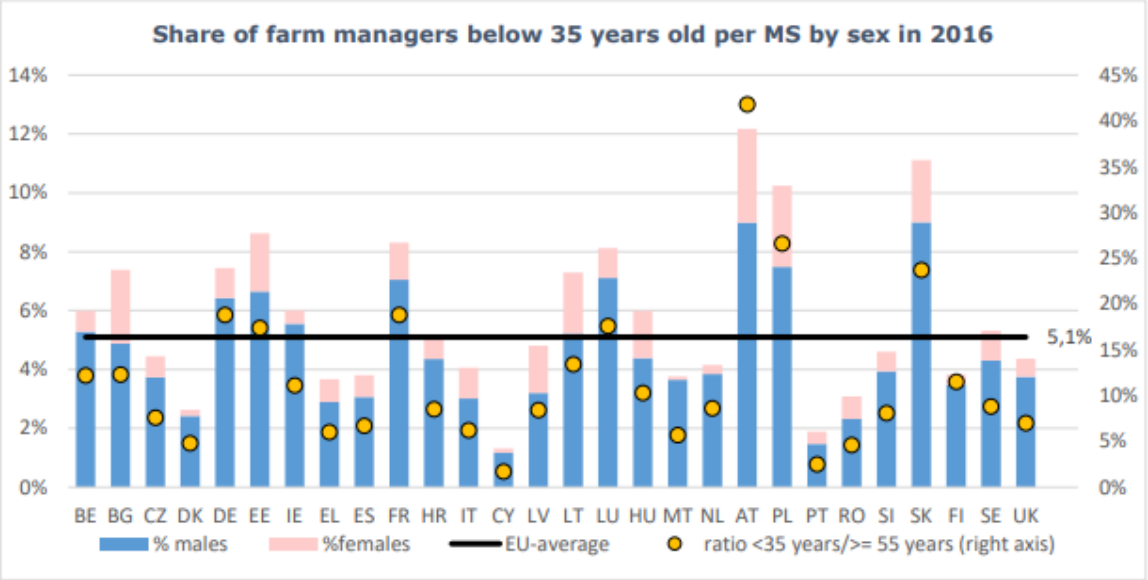
Figure 7.2 – Percentage of female farm managers EU, 2016 (Eurostat)



Malta has a low and declining share of young farmers as a percentage of total farm managers (3.8% in 2016, compared to 5.1% at EU level). Among these young farmers the share of women, as noted above is among the lowest in the EU[139]. According to the most recent 2020 Census of Agriculture (NSO 2022) agricultural managers were mostly male, with 11.1 per cent being female. Moreover, managers aged 44 years and younger amounted to 17.6 per cent of the total compared to 16.8 per cent in 2010. Managers aged 65 years and over accounted for 35.9 per cent of the total in 2020.

[139] EC (2019) Analytical factsheet for Malta, p.15

Figure 7.3 Share of farm managers below 35 years old by gender

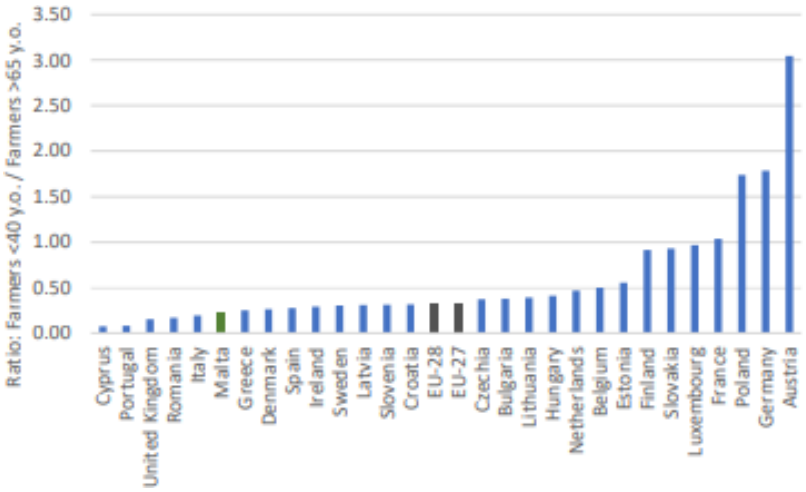


Source: DG Agriculture and Rural Development, based on Eurostat data 2016

Due to the economic constraints faced by the agricultural community as discussed under Specific Objective 1, farmers increasingly represent an ageing population. This is demonstrated by context indicator for the Common Agricultural Policy (CAP) which refers to the ratio of young farmers (youngerthan 40) to every older farmer (older than 65). Based on the data from 2016, in the EU, for every 10 older farmers (over the age of 65), there were 3 young farmers (a ratio of 0.3 young to elderly farmers). In Malta, there are only 2 young farmers for every 10 older farmers [140].

[140] E-Cubed Consultants, EMCS, Adi Associates 2021: THEMATIC EVALUATION YOUNG FARMERS RDP 2014-2020 (February 2021)

Figure 7.4 Young to elderly farmer ratio



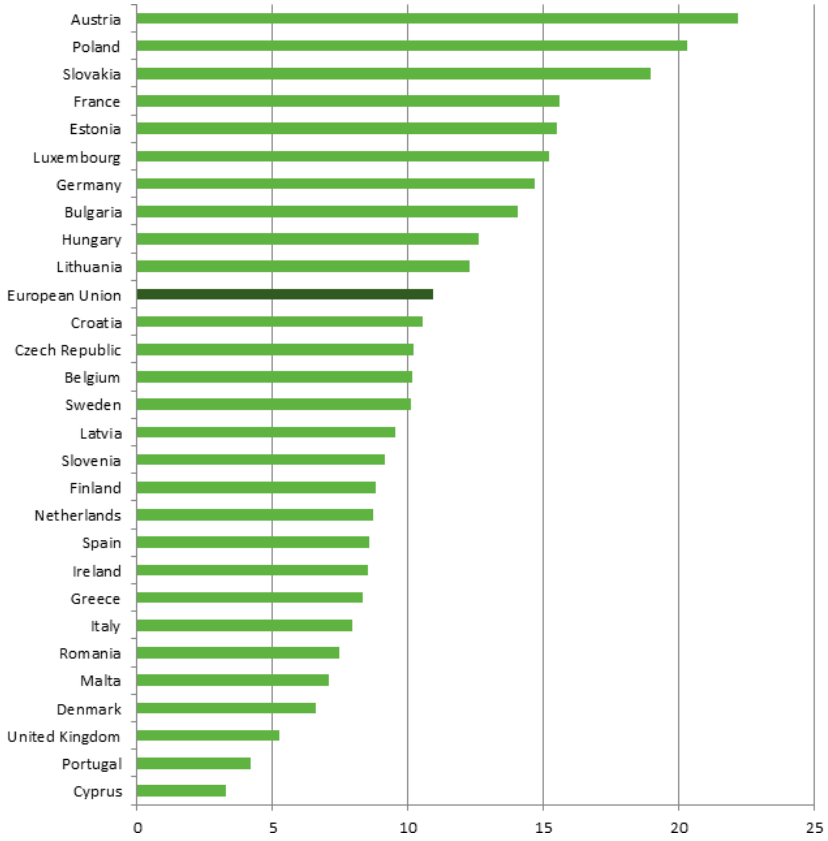
Source: Thematic Evaluation YF RDP 2014-2020 based on Context indicator 23 - Age Structure of FarmManagers data

The majority of farmers in Malta fall into the 40-64 and over 65 years bracket, with an average age of 55. For Malta, whereas generally 44.5% of the national workforce is aged between 40 and 64, the value for agriculture is much higher, at 73.7%. It is also evident that young people form a much lowerpercentage of the agricultural workforce, when compared to the general workforce (Eurostat, 2016).

Eurostat figures show that in 2016[141], out of the 10.3 million people working as farm managers across the EU, one third (32%) of farm managers were 65 years of age or older while only 11% of farm managers were under the age of 40. Figure 7.5 shows the percentage of young farmers amongMember States, with Malta at the lower end of the spectrum with around 7% of farm managers aged under 40 years, well below the EU average.

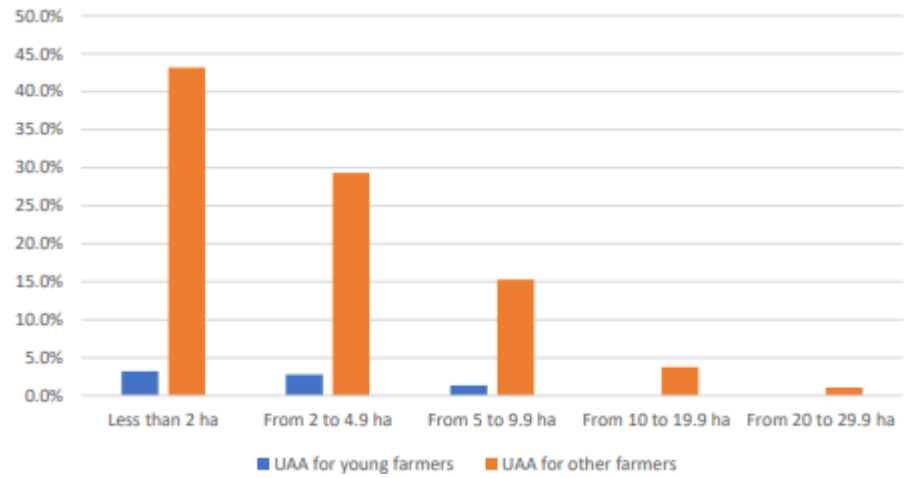
[141] Farming: Profession with relatively few young farmers, https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20180719-1?inheritRedirect=true (accessed 13 May 2020).

Figure 7.5 Percentage of farm managers aged under 40, 2016 (Eurostat)



In terms of the farm area managed by young farmers, this amounted to 8% of the total Utilised Agricultural Area (UAA) in 2016. The majority of the land managed by young farmers, around 76%, is less than two hectares (ha) and only 3% of young farmers have a farm area between 5ha and 9.9ha. As depicted in Figure 7.6, the majority of land is farmed by the older generation of farmers and land which is greater than 10 hectares is managed solely by relatively older farmers.

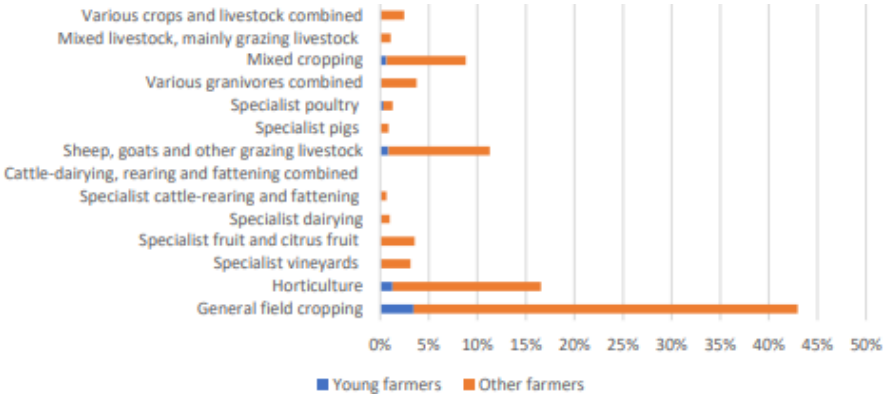
Figure 7.6 Distribution of land between young farmers and other age category of farmers - Malta



Source: Thematic Evaluation YF RDP 2014-2020 (2021) based on Eurostat data 2016[142]

Around 43% of the farms in Malta are engaged in general cropping, of which only 3% are managed by young farmers, yet this represents the highest proportion of farming activity by young farmers. Indeed 48% of the farms managed by young farmers focus on general cropping followed by 18% on horticulture [143](Figure 7.7).

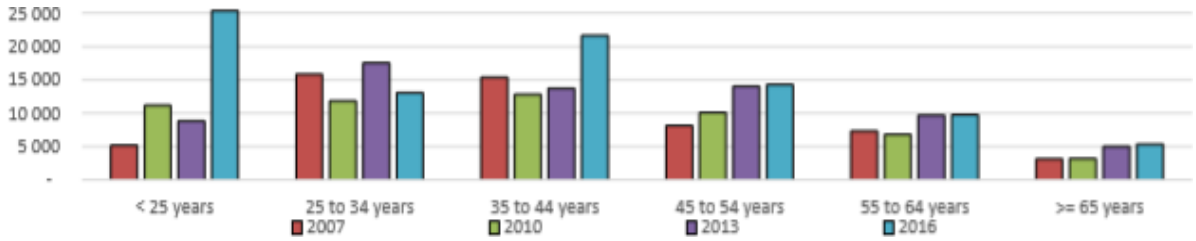
Figure 7.7: Type of farms by farmers categories (2016) - Malta



Source: Thematic Evaluation YF RDP 2014-2020 (2021) based on Eurostat data 2016

Average economic farm size in Malta is the highest for farmers up to 44 years old, as noted in Figure 7.8.

Figure 7.8 Average economic farm size measured as Standard Output, in Eur



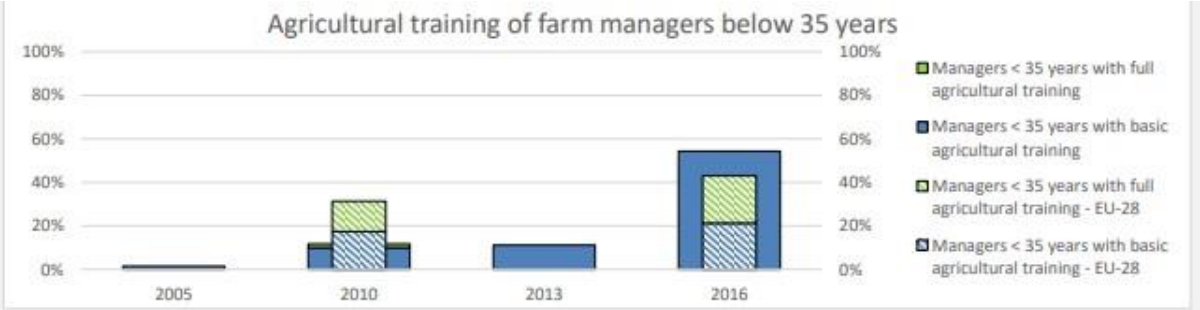
Source: DG AGRI – EUROSTAT

Young farmers contribute to about 15% of the total standard output produced by the sector. The standard output per farmer is higher for young farmers than it is for the older farmers potentially due to more efficient techniques of production. This is also common across Europe where young farmers tend to have larger farms[144]. The share of farm managers below 35 years of age with at least a basic level of agricultural training in Malta (at 54% in 2016) is above the EU average for this age bracket (Figure 7.9). This share is also much higher than the total share of farm managers with at least a basic agricultural training in Malta (31%).

[142] In this analysis, young farmers are considered up to the age of 45 years as Eurostat data prior to 2016 is not being captured for the bracket 35 to 39 years
[143] E-Cubed Consultants, EMCS, Adi Associates 2021: THEMATIC EVALUATION YOUNG FARMERS RDP 2014-2020 (February 2021)
[144] CAP Strategic Objective Brief No. 7

These data show how the younger generation of Maltese farmers have a higher level of knowledge and are much more likely to manage a full-time business, than their older compatriots, but they represent only a very small proportion of total farmers.

Figure 7.9 Agricultural training of farm managers



Source: DG AGRI – EUROSTAT 2016

Often, the conservative mentality of elder farmers restricts opportunity for new entrants in the sectorby denying them the opportunity to transfer land or hand over production capital. In many cases, young farmers are incentivised to search for more secure jobs to supplement their farming income orreplace it completely.[145]

More than the physical hardships of working in this sector or the natural constraints, young farmers claim that the most significant push factors for them to leave farming are the irregularity of income and the lack of capital to invest in modern machinery and equipment.[146] Young farmers also face otherbarriers before they can start agricultural activity in the form of:

- difficulties in accessing land due to the high costs of purchasing or renting, unless they inheritit;
- fragmentation of land meaning that it is difficult to acquire and manage a sufficient area for aviable business;
- difficulties in obtaining loans for business investment through regular commercial channels mainly due to lack of collateral (Thematic Evaluation YF, 2021);
- resistance from older farmers, often those from whom they will eventually inherit but first they must work with, who are not open to new ideas, innovation in production or marketing;and
- limited opportunities for continuous professional development related to both technical matters and business development skills and knowledge.

The National Agricultural Policy outlines a basic farming package of requirements that

[145] National Agricultural Policy for the Maltese Islands 2018 – 2028,pg.166, Parliamentary Secretary for Agriculture, Fisheries and Animal Rights, https://agrikoltura.gov.mt/en/agricultural_directorate/Documents/nationalAgriculturalPolicy/napFinal.pdf
[146] Ibid.

includes skills, knowledge, working capital and an agricultural holding; such assets are mostly available only to young farmers from farming families. To those coming from outside the sector the barriers to entry are therefore sizeable.[147] Existing young farmers that have been active within the sector for some time do not require start-up aid but may still face strong incentives to switch occupations. Such farmers need to be supported to ensure that they remain active within the sector and can continue to expand and modernise their businesses.

The National Agricultural Policy has identified four critical targets, one of which is to facilitate the entry of young farmers by creating a cost-effective agri-business sector. In view of the small and fragmented nature of many farms on Malta, increased strength from co-operation and innovation are needed, as are a better skills base and greater provision for continuous professional development in the sector. These challenges are discussed further in Specific Objective 3.

According to Malta's Agricultural Policy[148] an effective cooperative approach would alleviate most of the economy of scale issues faced by farmers, thus providing them with scope to invest and diversify their operations. The creation of functional cooperatives or farmer clusters is essential so that the sector can be re-organised to plan production according to demand, strengthen representation with authorities, increase efficiency and reduce production costs, as well as carry out research and promotion campaigns.

The previous RDP (2014-2020) elicited limited interest in the cooperation measure; in fact, only a small number of applications for funding through Measure 16 were received by the Managing Authority by August 2022**.** As noted in Specific Objective 2, these applications are indicative of potential for this kind of activity among certain agricultural actors in Malta. Therefore, supporting forms of cooperation is still relevant in the local scenario**.** Limited interest in the formation of Producer Organisations is a consequence of the high perceived administrative burden.

According to the National Agricultural Policy, consolidation of farmland must be pursued and should prioritise active farmers, farm-entrepreneurs and young agribusiness graduates who have a clear business direction in the sector. Land consolidation is seen as an important element to provide the means for motivated young farmers and entrepreneurs so that they secure a healthy farming future in the Maltese Islands [149].

The Maltese government supports young farmers through its land lease legislation. As noted in the National Agricultural Policy, land transfer regulations were amended in 2017 to permit land transfer of agricultural parcels to *bona fide* farmers and also providing agriculture students with leased land at a favourable rate for five years. These changes, although not falling within the remit of the CAP SP, can complement the efforts undertaken through Plan.

[147] Ibid, p. 33.
[148] Ibid, p.170.
[149] National Agricultural Policy for the Maltese Islands 2018 – 2028, pp.134 Parliamentary Secretary for Agriculture, Fisheries and Animal Rights, https://agrikoltura.gov.mt/en/agricultural_directorate/Documents/nationalAgriculturalPolicy/napFinal.pdf

Several measures are being provided through the CAP SP that will target support for young farmers, with the aim to attract young farmers into the agricultural sector. Measures under EAGF include direct payments such as BISS and CIS YF which will address income irregularity, and provide support during the first years of operation. EAFRD interventions will include a start-up aid scheme in the form of a lump sum that can be used for numerous investments, including farm modernization and purchase of new machinery amongst others. Legislative changes outside the scope of the CAP SP regarding limited land availability are ongoing, however support through a financial instrument under EAFRD interventions is foreseen, which will offer a loan guarantee, supporting young farmers in the purchase of land.

This FI is expected to create leverage for financial institutions to unlock credit opportunities to assist young farmers' access to credit to purchase agricultural land, enabling easier access to finance, paving the way for sustainable growth and improving their position in the local economy. Support under this FI may be combined with non-repayable grant support under the CAP SP targeting the installation of young farmers. This, together with a renewed impetus towards the roll out of advisory services related to business development, training possibilities and the young farmers schemes under Pillar I, will holistically aim to create the necessary framework for young farmers to establish and thrive in their agricultural pursuits. In turn, this will contribute towards generational renewal, a shift towards the adoption of new ideas and technologies, improved food security, as well as the long-term sustainability of the sector. The aim is to support young farmers in increasing both entrepreneurial and investment activities, increasing and maintaining employment, as well as improving the sustainability of the sector. Coordination with support provided by the Malta Development Bank (MDB), that is currently being supported through the Technical Support Instrument on the identification of Start-up financing gaps and the development of a financial instrument which provides support through various forms of finance and corporate management know-how, will be pursued.

Such interventions will be complemented with training measures targeted at young farmers that have benefitted from the start-up aid measure or the financial instrument, as well as those who have not. The existing Young Farmer installation measure in the Malta RDP 2014-2020 has been successful, and a cohort of young farmers has been established through this aid.

The Thematic Evaluation[150] (2021) reported that the measure was initially launched in April 2017 andin 2019, with the eighth call leading to a full absorption of the budget. Up to 2018, there were 25 beneficiaries. In the final call, 36 beneficiaries were approved, such that a total of 61 beneficiaries are supported, resulting in an attainment of the result target. The committed expenditure by the end of 2019 amounted to c.€4.2 million, with realised expenditure amounting to c.€3.3 million. It is also interesting to note that 11 beneficiaries of Measure 6.1 have benefited from other measures in the Programme. A majority have

[150] E-Cubed Consultants, EMCS, Adi Associates 2021: THEMATIC EVALUATION YOUNG FARMERS RDP 2014-2020 (February 2021).

benefitted from Measure 4.1, although there are individual beneficiaries who have also benefitted from Measures 4.4, 6.4 and 19.2. An RDP modification was undertaken in 2021, in view EURI funding and transitional period financing, through which, the budget allocated towards this Measure has increased. An open call for applications is ongoing (in August 2022) and is expected to close by end September 2022.

Strengths

Young farmers tend to be more innovative and more likely to invst in innovative, modern technologies that tend to be more efficient, both as regards production but also with regards to the use of resources. This is therefore likely to regenerate the sector in the long run.

As also highlighted in the RDP 2014 – 2020, there is an increasing awareness to innovate and learn thelatest techniques and farming methods, particularly among young farmers. Young farmers have high IT literacy and digital skills, supported by high level of next generation broadband coverage in Malta.

Because of the close proximity of Malta's rural land and settlements to its larger conurbations, business diversity in rural areas is already quite high and non-farming market opportunities are many.Nevertheless, diversification of some sectors such as tourism so as to offer more rural-oriented and environmentally focused business options could be beneficial to rural development.

Weaknesses

Compared to the EU average, the percentage of Maltese farm managers below the age of 40 is low and early results from the Census of Agriculture 2020 indicate that the situation has not significantly improved, with majority of farmers still falling into 55-64 and over 65 years old age bracket.

Amongst the most pressing challenge is the availability of land for farming which tends to be scarce and costly for either purchasing or renting purposes. Fragmentation of land, difficulties in obtaining loans for business investments, problems in accessing markets and resistance from older farmers arealso problems which young farmers have to deal with.

Training facilities in Malta may not be best suited to support the needs of a young generation of farmers whose general levels of education tend to be lower than young workers in other sectors. TheCensus of Agriculture[151] indicated that around 90.15% of the 11,713 sole holder managers declared that they had agricultural training only from practical experience. 8.6% of these sole holder managers,equivalent to 1,004, had basic training and only 1.3% or 149 had full training in agriculture. Sole holderholdings make up 90.7% of the total annual work units in agriculture, and the rest are limited liability companies and partnerships.

[151] The Census of Agriculture, NSO 2010.

Access to new and useful knowledge and the access to useful training/ workshops/ networks was listed as the second most pressing need identified by young farmers in Malta in the EKORYS study (2015) and it has been reiterated by recent survey among young farmers conducted as part of the Thematic evaluation[152] (2021).

Lack of access to subsidies and credit- while this has been to some extent addressed through RDP Measure 6.1 in 2014-2020, the financial resources required to set up a farm and maintain a sustainable livelihood through it are high, particularly for a young farmer and tailored support is needed for new entrants to farming.

There are also skills mismatch issues, where agriculture students graduating from higher educational institutions are not always taken on by entities or sectors directly related to agriculture[153], perhaps because they foresee that returns in the farm sector will be lower than those available to them in other occupations.

The image of farming in Malta still implies low returns, low value and little opportunity for entrepreneurial growth and development, in all sectors. This requires addressing if more young people are to be successfully attracted to the sector in both full and part-time businesses.

Opportunities

There are opportunities for farmers, especially young farmers, to innovate and set up enterprises, to for example attract rural tourism in rural areas, to further boost their income and and farm profitability. There is therefore potential to stimulate new business activities. The growing cohort of young farmers assisted by the current RDP 2014-2020 can be seen as potential ambassadors to recruit more young people into this career.

Developing niche markets and business diversification (e.g. eco-tourism) could offer additional income and support networking and collaboration activities among younger generation of farmers.

Young farmers require professional, tailor-made training and upskilling in order to become more efficient, however, this expertise may not be available locally. There is an opportunity for AKIS development in order to build a pool of experts better trained to transfer such knowledge, on both horticulture and veterinary services, to the local farming population and to young farmers in particular.[154] There is a need to tailor knowledge exchange and advice better to actual conditions – offering informal, frequent and easy-access options rather than long and formal training options which require many hours spent in class. Training measures for young farmers are foreseen in the CAP SP, and will offer support for young farmers that may be benefitted from the start-up scheme or the financial instrument, as well as those who have not.

[152] E-Cubed Consultants, EMCS, Adi Associates 2021: THEMATIC EVALUATION YOUNG FARMERS RDP 2014-2020 (February 2021).
[153] National Agricultural Policy for the Maltese Islands 2018 – 2028.
[154] Ibid, p. 32.

An improved and meaningful access to education and research could assist entrepreneurship and innovation in agriculture that lead to improved profitability and sustainability for small farms. Improving skills related to management, marketing, food safety, handling of food, processing, quality, and even more specialised skills in relation to each sector (e.g. meat, apiculture, etc.) would help young farmers rely less on the middlemen and sell directly to the market[155].

Certification related to educational courses should be provided and used to consolidate farmer

and livestock breeder classification systems through recognition of educational level and skills[156].Further opportunities can be developed through AKIS such as networks that train and support the introduction of young farmers through capacity building and transfer of relevant knowledge between generations

The establishment of Malta's strategy for land consolidation under the new Agricultural Policy should create more opportunities for re-parcelling land when it is released by a previous generation, to enable better installation by successors and new entrants. Furthermore, legislative changes outside the scope of the CAP SP regarding limited land availability are ongoing, with the aim of improving access to land.

Threats

Generational renewal in agriculture and rural areas ultimately relies upon the extent to which farming and other rural occupations offer a secure and valued source of future livelihood. Therefore, to the extent that Maltese agriculture is vulnerable to external threats which undermine its market share and its competitiveness in supplying Maltese consumers, then generational renewal in Maltese agriculture and related rural occupations is also under threat.

The acquired cultural and practical knowledge gained through experience of longstanding generations of farmers may be lost if not transferred to an emerging generation of farmers or if the uptake of new farming roles is relatively weak.

At present farming is not offering adequate income, also due to the limited support offered in previous programming periods under EAGF. Therefore young people tend to choose employment opportunities outside of agriculture, which offer greater financial security and opportunity for full time employment.

Poor perception of agriculture and it is not viewed as a desirable career path in view of the reasons mentioned above.

Land succession practices and unwillingness of old farmers to retire act as additional barriers for young farmers.

[155] E-Cubed Consultants, EMCS, Adi Associates 2021: THEMATIC EVALUATION YOUNG FARMERS RDP 2014-2020 (February 2021), survey of YF (2020) and ECORYS (2016) Needs of young farmers Report I of the pilot project : exchange programmes for young farmers, final.
[156] National Agricultural Policy for the Maltese Islands 2018 – 2028, p. 32

Implications for needs and the case for intervention

The ageing of Malta's farm population means that CAP policies should continue to offer support to encourage installation and successful development of young farmers. Consideration should be given to the need to promote both full time and part-time farming as an attractive and viable business option for young people in Malta. This may be enhanced further through the support that is being planned through the CAP SP with regards to the start-up aid scheme as well as the financial instrument aimed at supporting the purchase of land.

In the tourism and cultural sector, CAP policies can be used to encourage smaller-scale, added value and more diverse and rural-sensitive forms of tourist business that can be feasible to supplement a farm's income or to run as a full-time occupation in its own right.

The evidence discussed in the SWOT provides a good case for continuing the existing start-up aid for young farmers and also support for suitable 'added value', sustainable and innovative forms of rural business, notably including rural tourism, supported through EAFRD measures. According to survey ofyoung farmers and evidence from interviews and FG, conducted as part of the Thematic Evaluation Young Farmers (2021) "*young farmers are typically interested in digitalisation and technology and theyare working towards moving away from traditional methods and incorporating new methods and technologies in their production"*[157].

Through EAGF interventions, enhanced support will be provided, through complementary income aid for young farmers which provides an annual premium that can contribute towards enhanced economic performance of the holding. Additionally, training and advice for young farmers will also be provided through EAFRD interventions supporting Knowledge exchange and dissemination of information.

Thus the needs for this SO are:

7.1 Provide start-up financial aid for young farmers (including full and part time farmers)
7.2 Provide training, advice, mentoring and assistance for young farmers
7.3 Promote cooperation among young farmers to trade at a scale that is resilient and viable
7.4 Explore enhanced opportunities for access to land among young farmers
7.5 Facilitate land consolidation and farm transfer through legislative changes.

[157] E-Cubed Consultants, EMCS, Adi Associates 2021: THEMATIC EVALUATION YOUNG FARMERS RDP 2014-2020 (February 2021)

Specific Objective 8: Promote employment, growth, gender equality, including the participation of women in farming, social inclusion and local development in rural areas, including the circular bio-economy and sustainable forestry

Context and evidence

Rural development policy can play a role in promoting a more inclusive society and making rural areasa better place to live. Keeping people, and notably the young ones, in rural areas and addressing othersocial challenges require enabling conditions, such as access to business opportunities, knowledge, and basic services.

Rural areas in Malta cannot be considered remote and those inhabiting rural areas still have access to similar services as those inhabiting urban areas, including access to jobs, high speed broadband, medical and educational facilities. Therefore, the opportunities for rural and urban communities to interact and be interdependent are significant. Disadvantage is more associated with the agricultural sector than with rural location alone,and basic services are fairly universal across the Maltese Islands although the infrastructure provision in Gozo is slightly less advanced than the rest of the country, with Gozo also having a more seasonal labour market resulting in less extensive job opportunities. The role of agriculture and population density is significantly different between the islands.

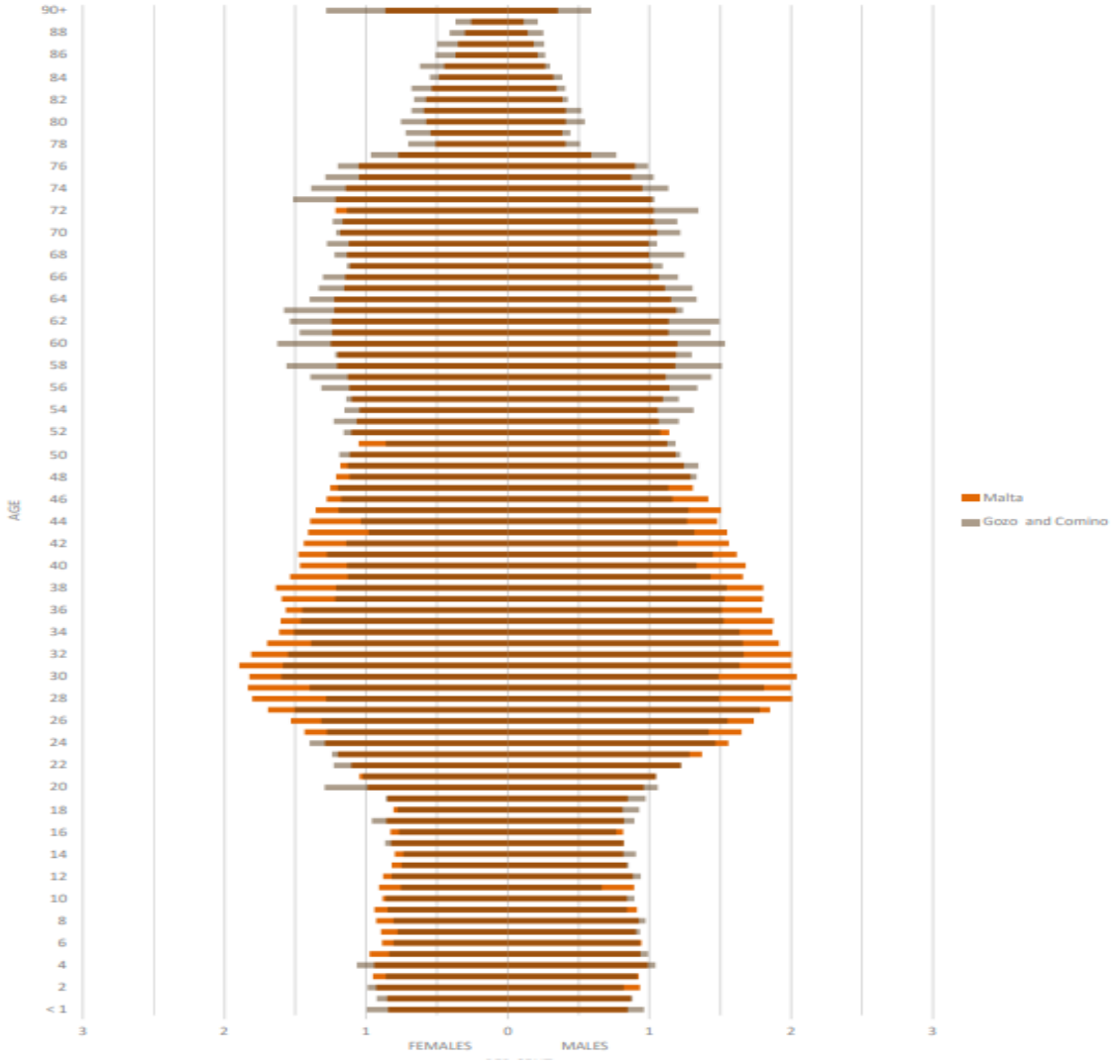
NUTS 3 divides MALTA into two regions: the first is comprised of the largest island – Malta, while thesecond region is comprised of the other two inhabited islands – Gozo and Comino. Both are defined as "predominantly urban" regions according to the NUTS 3 classification. For the purposes of the CAPSP, rural areas are defined under Chapter 4.

The number of inhabitants living in Malta as at the end of 2020 amounted to 516,100 with 481,537 residing in Malta and 34,563 residing in Gozo and Comino (Figure 8.1). Persons between 30 and 39 years of age accounted for the highest share, 17.8 %, of the population of the Malta region. Additionally, in the Gozo and Comino region, persons aged between 30 and 39 years, also accounted for the highest share that of 14.9 % of the population. The population between the two regions in terms of female-male distribution in both regions is even across most of the age groups, except for the 75 years of age and older where there was a broader share of females than males and which happened to be more pronounced in the Gozo and Comino region (Figure 8.2). On other hand, the age demographic structures differed between the two regions. The population in Malta showed relatively higher concentration in the 20 to 39 years of age with a relatively equal female-male distribution. However, the age structure of the population of the Gozo and Comino region displayed a higher proportion of persons over the 50 years of age with a relatively equal female-male distribution.

During the period 2014 to 2020, the population of Malta increased significantly every year,

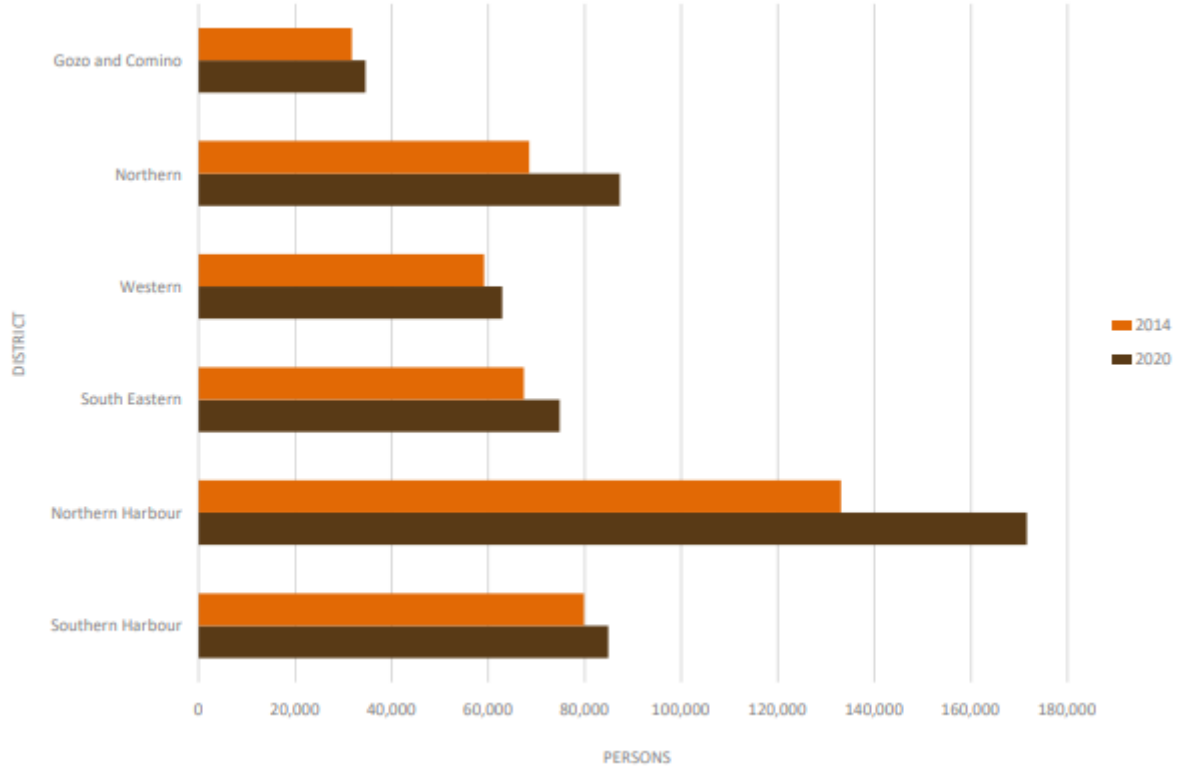
with an overall growth of 73,579 inhabitants. Similarly, the population of the Gozo and Comino region increased every year where there was an overall population growth of 2,830 inhabitants.[158]

Figure 8.1 Distribution of population by age, sex and region (NUTS 3): 2020



[158] NSO, Regional Statistics Malta 2022 Edition https://nso.gov.mt/en/publicatons/Publications_by_Unit/Documents/02_Regional_Statistics_(Gozo_Office)/2022/Regional%20Statistics%20Malta%202022%20Edition.pdf.

Figure 8.2 Population by district (LAU 1) and selected years



The Census of Population and Housing 2021 indicates that Gozo was inhabited by 34,563 residents, representing around 6.7% of the Maltese population. Malta retained its place as the most densely populated EU Member State, with the population density continuing to increase as a result of population growth, reaching 1,649 persons per square kilometre in 2021 – an increase of 324 persons per square kilometre (or 24.5 per cent) compared to 2011. The average in the EU in 2019 stood at 109 persons per square kilometre. Malta is 3.4 times more densely populated than Gozo at 1,948 persons compared to 572 persons per square kilometre respectively. In absolute terms, the population of Gozo has increased between 2011 and 2029, from 31,375 to 39,287 inhabitants. The populations of Malta and Gozo grew by a similar proportion from 2011, at 24.4 per cent and 25.2 per cent respectively.[159]

In 2017, GDP per capita in Gozo, in Purchasing Power Standards (PPS), corresponded to 60% of the EU-28 average, a level significantly lower than in Malta which is roughly at the EU-28 average[160] .The gap in relative economic development between the two islands widened from 2000 to 2017, from 26% to 41%. However, the relative proximity between the two islands allows workers to commute to the island of Malta while living in Gozo. In fact, more than 20% of the Gozo resident workforce works on the island of Malta. [161]

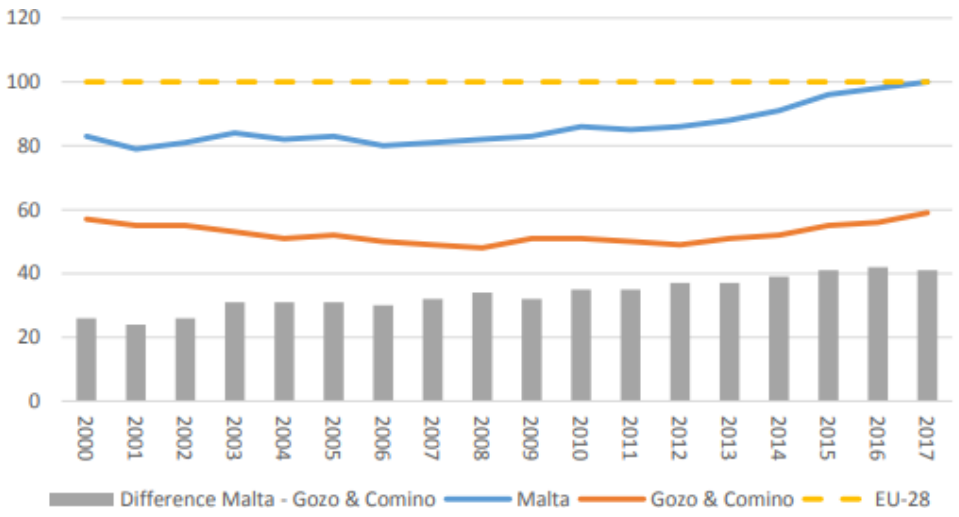
Figure 8.3. Evolution of GDP per capita in Purchasing Power Standards in the regions of Malta, Gozo and Comino, 2000-2017 (EU-28 =

[159] NSO (2022), Census of Population and Housing 2021, Preliminary Report https://nso.gov.mt/en/nso/Media/Salient-Points-of-Publications/Documents/2022/Census%20of%20Population%20and%20Housing%20Preliminary%20Report/Census%20of%20population%202021.pdf

[160] European Commission (2019) REPORT FROM THE COMMISSION TO THE COUNCIL 2019 report on the economic and social situation of Gozo (Malta).

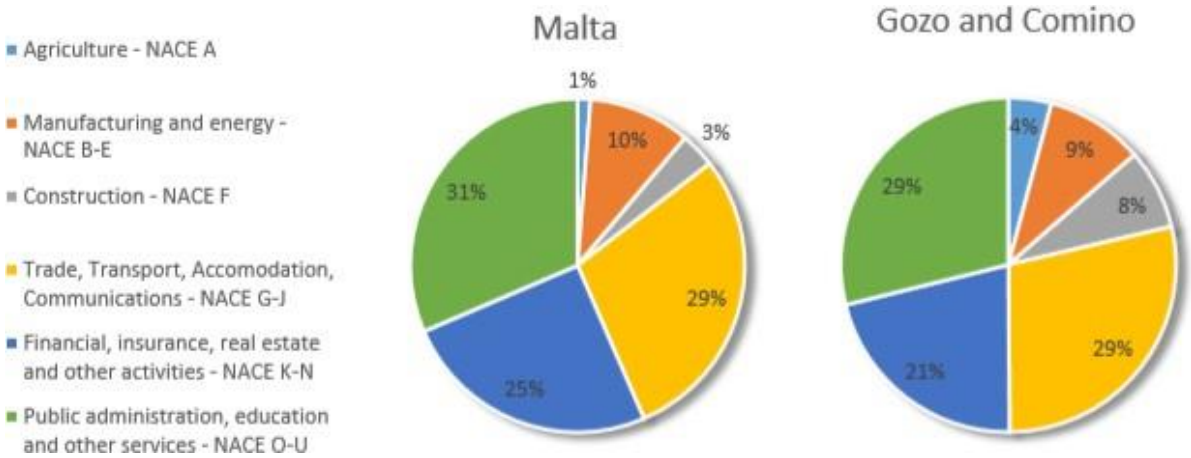
[161] Ibid.

100)[162]



Regarding the sectoral composition of Gross Value Added between two regions, the economy of Gozorelies more on agriculture and fishing and construction sectors than the island of Malta, and less on financial, insurance, real estate and other services (Figure 8.4).

Figure 8.4 Composition of Gross Value Added in the regions of Malta, Gozo and Comino



Source: European Commission (2019) based on Eurostat data 2016

The composition of the workforce on the two islands is very similar to the composition of Gross ValueAdded[163]. Gozo employs 4% more people in agriculture and fishing, and 3% more in construction than Malta, but 7% less in the financial, insurance, real estate and other

[162] Ibid.
[163] Eurostat 2016.

services.

The employment rate in Malta increased from 57% in 2000 to 73% in 2017. The employment rate in predominantly rural areas tracked this increase, reaching 75.3% in 2017. The employment rate for women has increased significantly since 2005 but remains relatively low[164] by comparison with other Member States.

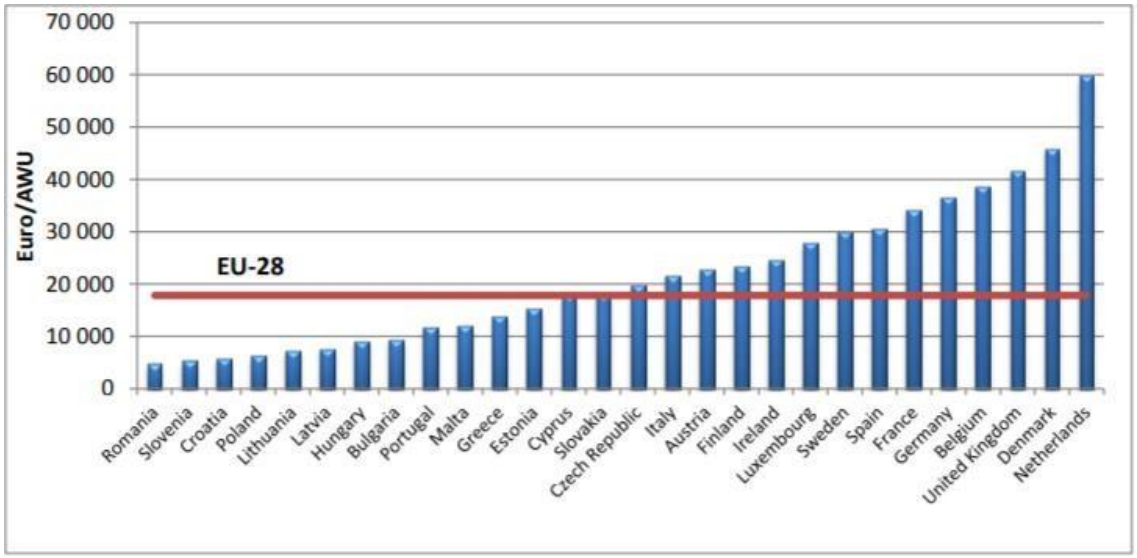
In recent years, female employment trends have been on the increase, registering an improvement from 54.3% in 2014 to 69.6% in 2021.[165] As discussed under SO7, the agricultural sector is predominately male oriented, with females only occupying 11.1% of the population. Under the RDP (2014-2020) around 14% of the beneficiaries under land-based measures (ANC and AECMs) were women. For the other measures under the RDP 14-20, only around 7% of the beneficiaries were women. It is expected that in line with the share of women in the sector, this representation will continue over the 23-27 period.

Such low levels can be attributed to women facing various limitations such as being the primary carers of dependent persons. Whilst acknowledging the latter, it is important to note that in Malta, there is no distinction between women living in rural or urban areas. In addition, in the Maltese context, there are different opportunities in rural areas for women, not only limited to activities in the farming industry. Furthermore, it must also be noted that whilst Gozo faces double insularity and challenges associated with the resulting vulnerability, this does not translate to disadvantages being faced specifically by women living in rural areas. This specific characteristics of Gozo affect equally all individuals living on the island. Nonetheless, Government is committed to further facilitate the entry into the labour market of women in an effort to achieve improved gender balance.

Farming in Malta is characterised by relatively low incomes and low levels of formal education and training, compared to employment in other sectors. As presented in Specific Objective 1, FADN data suggests that average income per Annual Work Unit (AWU) in agriculture in Malta is about 60% of the average income per AWU across all sectors. As presented in Specific Objective 7 the Census of Agriculture [166] indicated that around 90.15% of the 11,713 sole holder managers declared agricultural training only from practical experience. Thus, to some extent it can be said that agriculture is a sector that faces a degree of disadvantage and social exclusion, which merits action to address.[167]

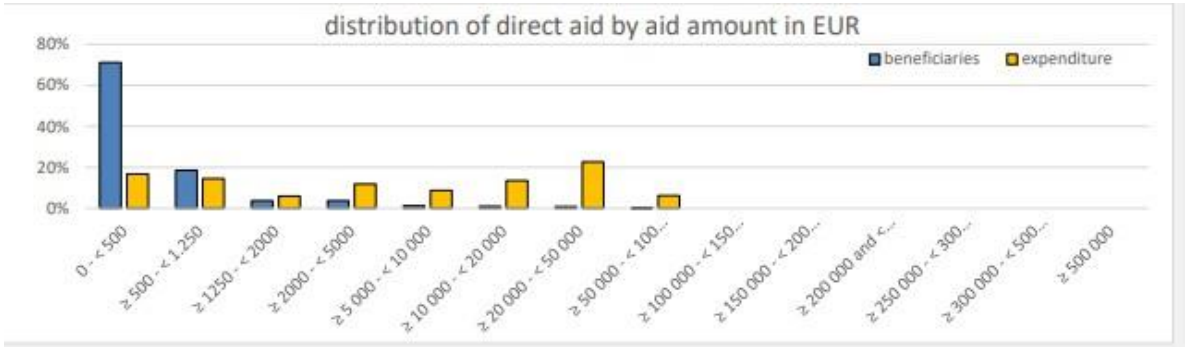
[164] EC (2019) Analytical factsheet for Malta: Nine objectives for a future Common Agricultural Policy p.16.
[165] https://ec.europa.eu/eurostat/databrowser/view/LFSI_EMP_A__custom_3212189/default/table?lang=en
[166] The Census of Agriculture, NSO 2010.
[167] Agricultural and farm income, DG Agriculture and Rural Development, Unit Farm Economics https://ec.europa.eu/agriculture/sites/agriculture/files/statistics/facts-figures/agricultural-farm-income.pdf.

Figure 8.5 Agricultural factor income (current) per AWU by country (source: EC)



The distribution of direct payments reflects the specific characteristics of Maltese agriculture with many small farms, but also the targeting of the (indoor) dairy farming sector through coupled payments to relatively large but entirely landless farms. The 20% largest beneficiaries concentrate 72% of the direct payments, which is higher than the concentration of land. (Figure 8.6) [168].

Figure 8.6 Distribution of direct payments (2017)



[168] EC (2019) Analytical factsheet for Malta: Nine objectives for a future Common Agricultural Policy, p.17.

To address the relative disadvantage of farming communities, education/training and skills development, adding value to farm produce and agri-food- tourism are all promising options.

Vertical integration with the food sector, as well as linking producers to consumers in hospitality, tourism and related roles – offers opportunities to enhance the status and level of skills in the sector, although enhanced co-operation could also increase the reach and scale of such developments.

The COVID 19 pandemic has had an unprecedented negative impact on the Maltese economy, with the hospitality and agricultural sectors hit hard. Malta's economy relies heavily on the tourism sector and international trade; thus, it was severely affected by the outbreak of the COVID-19 pandemic and the restrictions that followed.

Agricultural income is also linked to tourism that was severely impacted by the COVID-19 pandemic. Inbound tourists for 2020 added up to 969,246, an increase of 47% over 2020, however, the value is still much lower than pre-pandemic levels - the number of tourists in 2019 exceeded 2.7 million.[169]

The study on Analysis of the Impact of COVID-19 on the Economic Activity of the Agricultural Sector in Malta (2020) noted that "*when compared to the baseline scenario, wherein COVID-19 would not have been an issue, the loss in tourism expenditure by inbound tourists excluding airfare is estimated at -€1.3 billion and -€484.2 million by the end of 2020 and 2021, respectively. As a result of this loss in tourism expenditure, the change in the direct and indirect economic value added when compared to a baseline scenario is estimated at -€820.2 million and -€300.1 million by the end of 2020 and 2021, respectively. Furthermore, the loss in the economic value added of the agricultural and fisheries sector is estimated at -€12.2 million in 2020 and -€4.5 million in 2021. The loss in value added when compared to the baseline scenario during the peak season between April and September is estimated at -€10.2 million".*

[169] NSO (2022), Inbound Tourism: December 2021 https://nso.gov.mt/en/News_Releases/Documents/2022/02/News2022_019.pdf

Table 8.1 Change in Tourism Expenditure and Sectoral Economic Value Added Over the Baseline Scenario[170]

Change from Baseline	2020	2021
Effect on expenditure (excl. airfare) by inbound tourists (€m)	**-1323.5**	**-484.2**
Effect (direct and indirect) on economic value added (€m)	**-820.2**	**-300.1**
Agriculture and Fisheries	-12.2	-4.5
Production	-60.7	-22.2
Construction	-12.7	-4.6
Distribution	-126.5	-46.3
Transport	-167.5	-61.3
Hotels and Restaurants	-268.4	-98.2
Arts, Entertainment and Recreation	-71.9	-26.3
All Other	-100.2	-36.7

Source: E-Cubed Consultants estimates based on NSO data

The Maltese agricultural sector experienced a notable loss in its economic value added as a result of the global pandemic. International tourism demand is considered as the main channel of the COVID-19 shock which is in turn affecting all the sectors in the economy including the agricultural sector. The Maltese government has therefore paid emergency support to its various agricultural sectors to help them to cope with the impacts of the pandemic.[171]

Malta Tourism Strategy 2021-2030 is based on the three-pronged approach of Recovering, Rethinkingand Revitalising this important pillar of Maltese economic activity.[172]

Malta's rural areas have an important role to play in the economic recovery, especially in relation toagriculture and tourism.

Malta's rural areas have untapped potential for enhanced quality of life through the restoration and extension of natural, heritage and socio-cultural features (including traditional and novel arts and crafts), providing benefits for residents and also offering scope for a greatly extended quality of rural and ecological/green tourism provision. Green infrastructure and the creation of more climate-proof and water-conserving facilities within this, is also an important area for small-scale innovative actions**.** Malta's unique cultural heritage in rural areas has tended to receive less attention than its most famous urban sites and monuments, over the years. For these reasons, rural development *per se* in Malta tends to coalesce around sustainable agricultural development and the restoration and valorisation of social, cultural and natural heritage assets in rural areas, as a means both to enhance quality of life in rural areas, and to enhance quality and sustainability in rural tourism.

LEADER in Malta has played the central role in broader rural development beyond

[170] E-CUBED Consultants (2020) An Analysis of the Impact of COVID-19 on the Economic Activity of the Agricultural Sector in Malta.

[171] Ibid.

[172] Malta Tourism Authority (2021) Malta Tourism Strategy 2021-2030 - Recover, Rethink, Revitalise Stakeholders & Public Consultation,p.32.

agriculture, but this role has tended to be rather limited, as demonstrated by the level of spending and scope of supported actions to date. Challenges have included a lack of institutional experience, as well as limited engagement of the local municipalities and other rural actors with Local Action Groups (LAGs), in some instances. LEADER has nonetheless successfully supported NGO/VOs in tapping into funding sources for small projects, providing resources for smaller initiatives that would not be eligible for funding under mainstream programmes. LEADER therefore serves as an opportunity for local communities to develop and implement strategies that are specifically elaborated to reflect the needs of their territories.

Three Local Action Groups (LAGs) were selected to continue implementation of LEADER during the 2014 – 2020 programming period. The main focus of the LAGs in Malta is on continued cultural and social development of rural areas, and promotion of the cultural heritage; investment in environmental and sensible landscaping of the rural areas; and fostering development of skills, knowledge base and transfer, with a focus on crafts. In Gozo, the LDS is focused on developing an ICT media platform as a tourism product; support for local food and gastronomy as well as sustaining young people on the island.

LEADER will be an important tool for the delivery of this Specific Objective, by supporting the sustainability of rural communities through adding value to the social, environmental economic aspects of the territory through investment in key infrastructure, training and development projects in rural areas.

The specific support provided by LEADER will depend on the Local Development Strategies that will be drafted by the respective Local Action Groups using a bottom-up approach and inclusive local participation. Through these LDSs, LEADER may support cultural, touristic and artisanal interventions, as well as promoting social inclusion and reducing poverty in rural areas, also based on the particular socio-economic status prevalent in the region. Interventions may also encourage economic growth, jobs and innovation, cooperation and knowledge transfer. The Local Development Strategies should therefore be complementary to the goals of the CAP Strategic Plan, other Operational Programmes and relevant national policies and strategies.

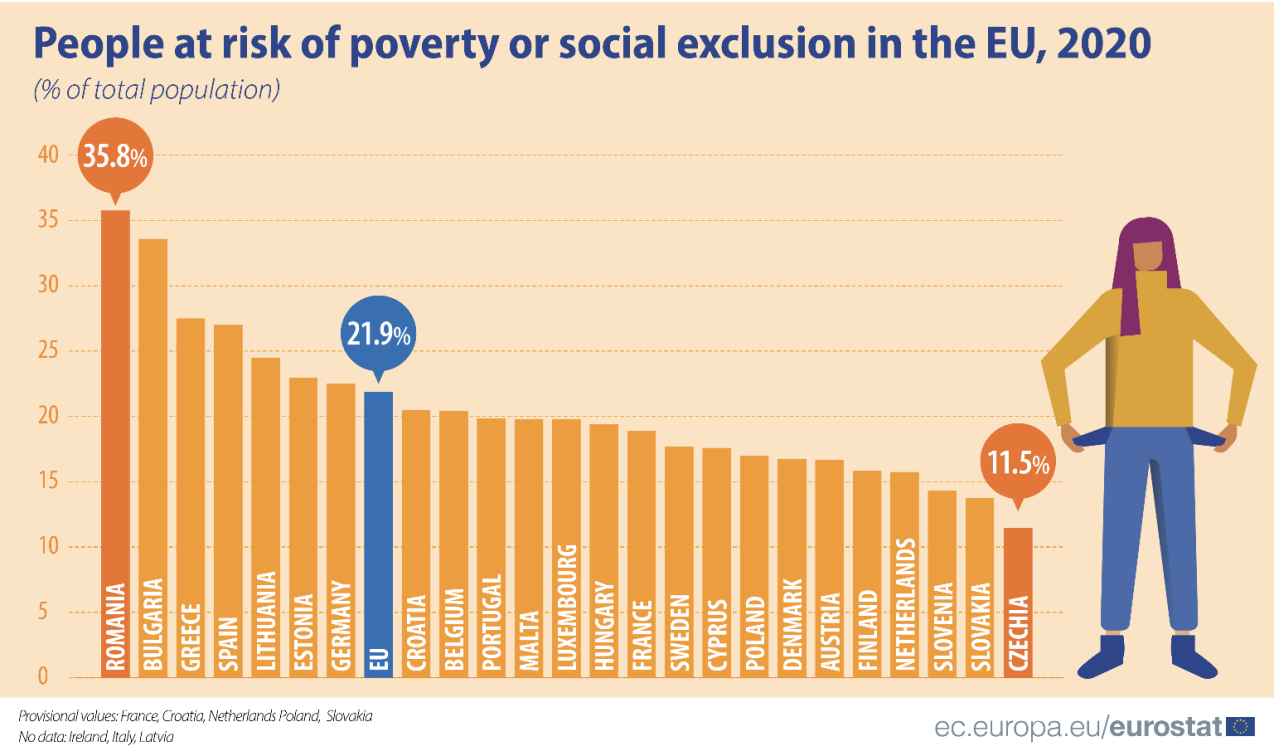
The National Strategic Policy for Poverty Reduction and for Social Inclusion, launched in 2014 [173], represents a comprehensive approach to address poverty and social exclusion. The focus is on Malta's population in general and four target populations in particular, namely children, elderly persons, unemployed people and the working poor. It addresses poverty from six dimensions which include social services, health and environment, culture, income and social benefits, education and employment.[174]

In 2020, 96.5 million people in the EU-27 were at risk of poverty or social exclusion; this was

[173] National Strategic Policy for Poverty Reduction & For Social Inclusion 2014-2024, https://family.gov.mt/wp-content/uploads/2021/05/Poverty-Strategy-14-EN.pdf
[174] Ibid.

equivalent to 21.9 % of the EU-27 population. According to EU-SILC, in 2021 the at-risk-of-poverty or social exclusion rate was estimated at 20 per cent of the population living in private households in Malta, slightly below the EU average (Figure 8.7).

Figure 8.7 People at risk of poverty or social exclusion 2020



The at-risk-of-poverty threshold is set at 60 per cent of the national equivalised income which proportion, in 2020, was calculated at €9,744. The largest share was registered among the elderly persons aged 65 and over – nearly 26.3% of this age cohort[175]. At a district level, the distribution of persons under the at risk of poverty rate (ARP) threshold was uneven across the Maltese Islands, with the Northern Harbour district having the largest share of ARP persons followed by the Southern Harbour district. On the other hand, the Western district registeredthe lowest ARP rate.

Figure 8.8 Distribution of the at-risk-of-poverty rate (ARP) by district

[175] NSO Malta and ESS (2021) News Release 2/2021 EU-SILC 2019: Material Deprivation and Monetary Poverty https://nso.gov.mt/en/News_Releases/Documents/2021/12/News2021_221.pdf

Chart 3. Distribution of the at-risk-of-poverty rate (ARP) by district: 2020

Source: NSO Malta (2020) EU-SILC 2020

The At-Risk-Of Poverty or Social Exclusion (AROPE) indicator is used to monitor the EU 2020 Strategypoverty target[176]. Table 8.2 shows how the AROPE rate for Malta exhibited a substantial decrease between the base year 2013 (24.6%) and 2019 (20.1%). This decrease is mainly attributed to a numberof factors, including robust economic performance leading to low unemployment rates. Malta has generally experienced a lower AROPE rate in comparison to the EU average, in recent years. However,at 20.1%, the at-risk-of-poverty or social exclusion rate (AROPE) increased by 1.1% when compared toEU-SILC 2018. The increase can be noted across all age groups, with the highest increase experiencedamong persons aged 65 and over, with 2.4%, thus reaching a rate of 29.1% for this cohort (Table 8.2)

Table 8.2 At-Risk-of-Poverty or Social Exclusion in Malta and EU by Sex, 2013-2019[177]

[176] The AROPE indicator refers to people in a household who are either at risk of poverty, are severely materially deprived or in a household with a very low work intensity.

[177] National Strategic Policy for Poverty Reduction & For Social Inclusionhttps://family.gov.mt/wp-content/uploads/2021/05/Poverty-Strategy-14-EN.

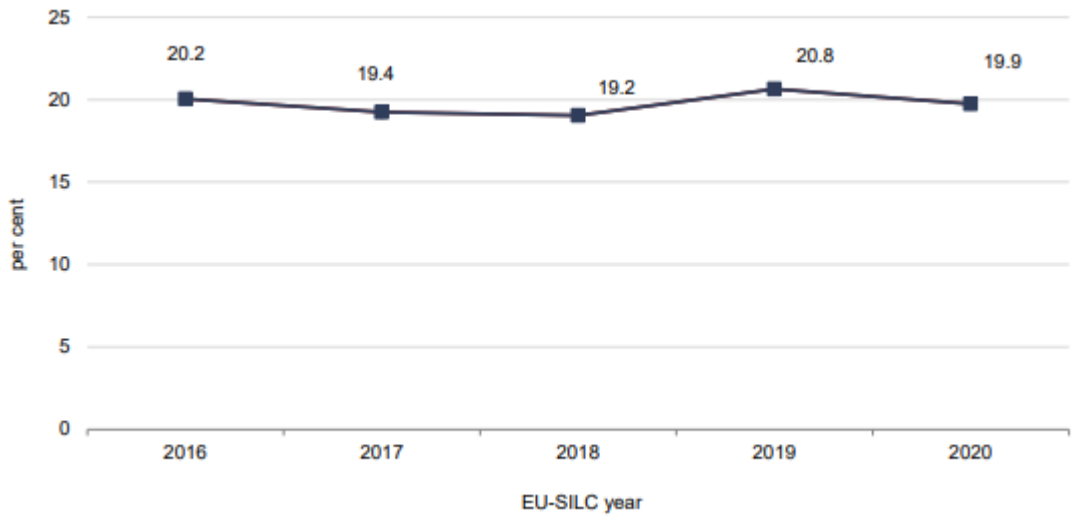
At-Risk-of-Poverty or Social Exclusion	2013	2016	2017	2018	2019
EU	24.6%	23.5%	22.4%	21.8%	:
Malta	24.6%	20.3%	19.3%	19.0%	20.1%
Malta: At-Risk-of-Povertyor Social Exclusion	102,000	90,000	87,000	89,000	97,000
Malta: Not At-Risk-of-Poverty or Social Exclusion[119]	**312,000**	**353,000**	**365,000**	**378,000**	**388,000**
EU: Males	23.7%	22.6%	21.5%	20.8%	:
Malta: % Males	23.8%	20.2%	18.5%	17.4%	18.8%
Malta: Males	49,000	45,000	42,000	42,000	46,000
EU: Females	25.5%	24.4%	23.3%	22.8%	:
Malta: % Females	25.5%	20.4%	20.2%	20.6%	21.4%
Malta: Females	53,000	45,000	45,000	47,000	51,000

Table 8.3 Number and share of persons at-risk-of-poverty or social exclusion (AROPE) by various socio-demographic characteristics

Characteristics		2016		2017		2018		2019		2020	
		Number of persons	%	Number of persons	%	Number of persons	%	Number of persons	%	Number of persons	%
Sex	Male	43,835	19.6	42,174	18.5	41,035	17.3	47,145	19.0	47,733	18.3
	Female	45,467	20.7	45,519	20.3	48,654	21.1	53,431	22.6	52,979	21.8
Age	Under 18	18,600	23.7	18,750	23.6	18,797	23.3	19,587	23.9	18,729	22.6
	18-64	49,793	17.4	47,322	16.3	47,434	15.7	54,285	17.2	56,346	17.0
	65 and over	20,910	26.7	21,621	26.5	23,458	27.8	26,704	30.7	25,637	28.5
Most frequent activity status[1]	At work	13,911	7.3	13,520	6.8	15,115	7.1	18,733	8.2	22,632	9.1
	Unemployed	5,365	63.6	4,120	71.2	3,494	66.4	1,971	57.0	2,964	59.6
	Retired	14,277	23.0	16,466	23.1	16,372	25.8	18,607	27.0	16,378	23.9
	Other inactive	34,660	36.3	33,620	36.3	35,579	35.3	40,446	41.0	39,592	40.5
Highest level of education achieved[2]	Low	59,884	28.7	55,615	27.1	58,071	27.5	64,612	29.5	64,670	28.9
	Medium	10,770	11.2	13,230	12.7	12,430	11.5	15,040	13.6	14,114	11.9
	High	2,346	3.5	[2,451]	[3.4]	2,782	3.6	2,997	3.7	4,865	5.5
Tenure status of the household	Outright owner	47,285	17.9	46,621	17.4	50,289	18.3	53,525	18.9	53,965	18.2
	Owner paying mortgage	10,650	11.0	8,951	8.9	9,495	9.0	10,054	9.7	12,594	10.8
	Tenant or subtenant paying rent	27,070	42.2	28,414	42.4	25,186	37.4	32,215	41.3	28,752	41.0
	Accommodation is provided free	4,298	23.7	3,708	21.2	4,718	25.2	4,781	23.7	5,402	25.7
Total		**89,302**	**20.2**	**87,693**	**19.4**	**89,689**	**19.2**	**100,576**	**20.8**	**100,712**	**19.9**

[1] Includes persons aged 18 years or more. For more information refer to methodological note 4.
[2] Includes persons aged 16 years or more. For more information refer to methodological note 4.

Figure 8.9 Share of people at-risk-of-poverty or social exclusion (AROPE)[178]



Around two fifths (42.1 %) of the EU-27 population living in single adult households with dependent children was at risk of poverty or social exclusion in 2019 [179]. According to Eurostat data people living in single-parent households constitute a particularly vulnerable group, with Malta being no exception. In fact, this category is by far the highest in comparison to other groups (Table 8.4).

Table 8.4 At-risk-of-poverty or social exclusion rates (AROPE) by age group, sex and household type:EU-SILC 2018-2019

Age group	Sex	2019	2020	
		%	%	Number of persons below the threshold
All ages	Males	16.1	15.6	40,784
	Females	18.1	18.3	44,585
	Total	**17.1**	**16.9**	**85,369**
Under 18	**Total**	**20.6**	**20.4**	**16,901**
18-64	Males	12.1	12.8	22,565
	Females	14.4	14.3	22,252
	Total	**13.2**	**13.5**	**44,817**
65 and over	Males	25.9	24.7	10,402
	Females	29.3	27.8	13,249
	Total	**27.7**	**26.3**	**23,650**

Table 8.5 Persistent at-risk-of-poverty rate, 2020, EU-28 [180]

[178] NSO EU-SILC (2020) News Release 221/2021: Material Deprivation and Monetary Poverty, https://nso.gov.mt/en/News_Releases/Documents/2021/12/News2021_221.pdf

[179] Eurostat 2021, Children at risk of poverty or social exclusion, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Children_at_risk_of_poverty_or_social_exclusion

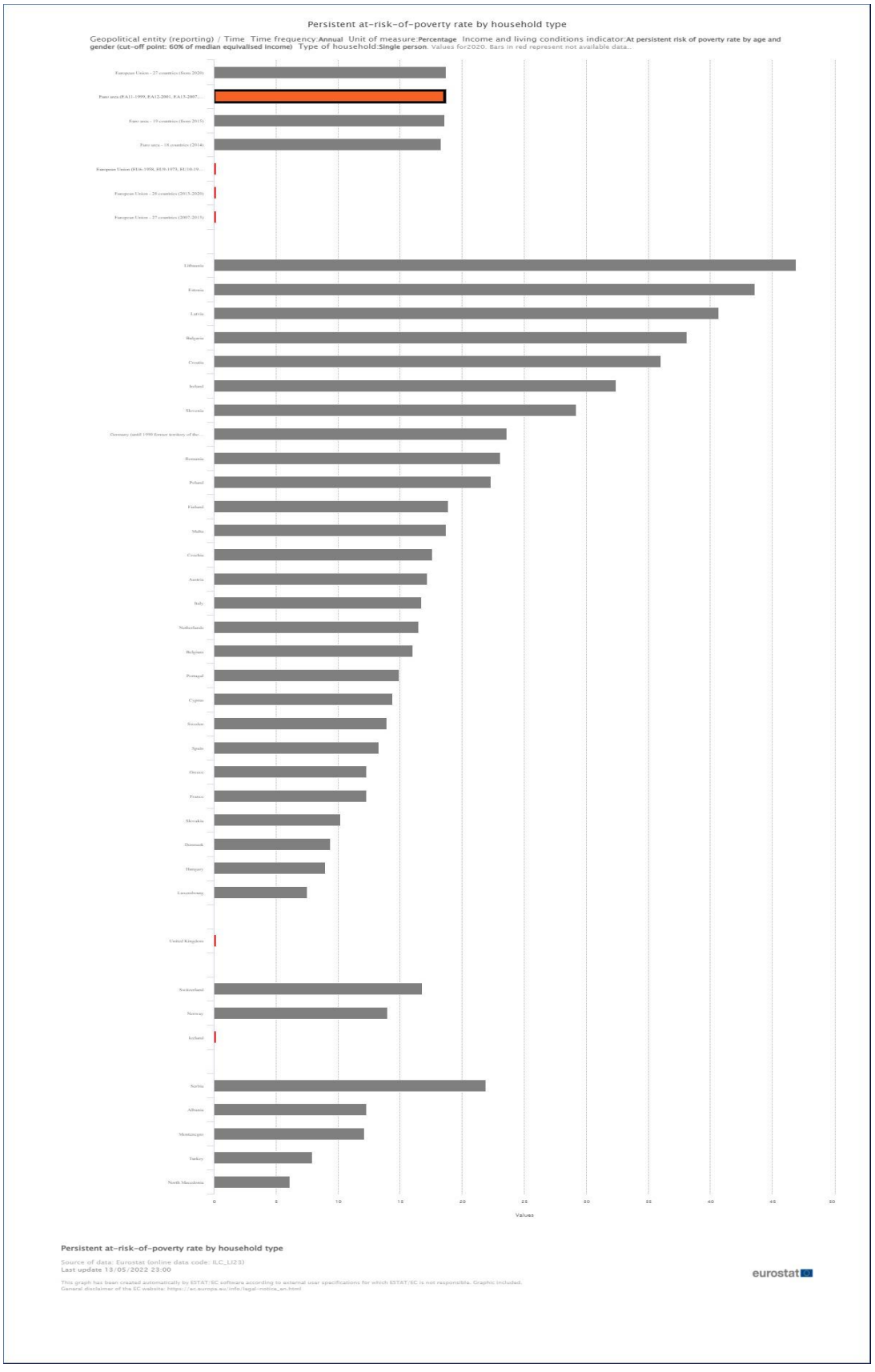
[180] Eurostat Persistent at-risk-of-poverty rate by household type, https://ec.europa.eu/eurostat/databrowser/view/ilc_li23/default/bar?lang=en

Household type	2019	2020	
	%	%	persons below the threshold
All households	**17.1**	**16.9**	**85,369**
Households without dependent children	**16.9**	**16.4**	**42,576**
of which:			
One person household, under 65 years of age	26.7	32.6	9,807
One person household, 65 years old and over	28.5	30.7	8,424
Two adults, no dependent children, both under 65 years of age	11.0	8.9	5,736
Two adults, no dependent children, at least one adult aged 65 or more	29.6	26.2	15,022
Other households without dependent children	4.5	4.5	3,588
Households with dependent children	**17.3**	**17.5**	**42,793**
of which:			
Single parent household, one or more dependent children	42.9	49.7	7,861
Two adults, one dependent child	9.4	9.9	7,209
Two adults, two dependent children	17.6	18.3	11,225
Two adults, three or more dependent children	33.1	35.8	4,584
Other households with one or more dependent children	14.6	14.4	11,913

Source: NSO Malta EU-SILC 2020 (2021)

The AROPE rate for elderly people over 65 years of age in Malta tends to be much higher than the EUaverage. As shown in Table 8.4, AROPE rate among the elderly decreased slightly from 27.7% in 2019 to 26.3% in 2020. While pensions in Malta have been increasing annually over the last few years, wages have increased at a higher rate, thus pushing up the poverty threshold. It is worth noting that another contributing factor is that social transfers in kind, such as free health care and free medical aid which are more likely to be accessed by older persons, are not captured in the data. Moreover, in contrast to the EU most pensioner households in Malta depend on just one pension, as many Maltese women did not accrue pension entitlements[181]. The persistent at-risk-of-poverty rate shows the proportion of people with a level of income below the poverty threshold in both the reference year as well as the preceding year. In 2019 and 2020, there was a higher persistent risk of poverty among the population living in single person households. On average, more than one fifth (21. %) of the EU-28 population living in single-parent households was at persistent risk of poverty, while 18.2% of the population living in single person households faced similar risks of persistent poverty (Table 8.5); both of these figures were considerably higher than the risk of persistent poverty recorded for people living in households with two or more adults (irrespective of whether or not they had children). Figures for Malta were well above EU average.

[181] National Strategic Policy for Poverty Reduction & For Social Inclusion 2014-2024, https://family.gov.mt/wp-content/uploads/2021/05/Poverty-Strategy-14-EN.



Malta's social inclusion policies have no specific focus on rural areas and their population; however, there could be scope for LEADER to target this issue in rural areas and among farming communities, learning from other best practices that good examples of such actions in other Member States.

Animation and exchange have been weak among and between Malta's LAGs and the EU-wide LEADERnetworks, which has constrained capacity among LAG actors and in the development of

LDSs.

Malta, including its rural areas, is rich in cultural heritage, with a dense concentration of artefacts ranging from Neolithic monuments, remains of Phoenician and Roman civilizations, rare examples of early Christian and medieval architectural, imposing constructions by the Order of St. John and nineteenth century examples of British military and civil architecture. In order to improve the quality of life in rural areas, there is also the need for better recreation, cultural and tourism infrastructure that may be targeted through LEADER.

In addition to all this, there is a need to continue improving rural roads, with the aim of enhancing accessibility to increase land utilization, improve access to machinery, prevent land abandonment, improve farm management and increase farm efficiency. Road infrastructure remains necessary to increase competitiveness and accessibility, as well as mitigate risk from adverse weather conditions. Improving the rural road network will also cut down on the time required by farmers to travel from one land parcel to another, keeping in mind the fragmented nature of local agricultural holdings.

Strengths

Favourable economic conditions and low unemployment rates pre-COVID 19 pandemic have brought about a decrease in the number of people that are at risk of poverty or social exclusion along the years. Therefore, the LEADER programme can be used to further support and strengthen communities within the respectiveterritories.

Amongst the general public, there is enthusiasm to maintain local culture and traditional events, especially following their suspension during the COVID-19 pandemic. There is therefore renewed scope for more support to improve existing festivities, for the enjoyment of the general public and tourists.

Currently, Malta's three LAGs cover all of its rural territory and have a good level of institutional support. Maltese community groups appreciate many aspects of social and cultural heritage and there is enthusiasm to maintain local culture and traditional events such as football clubs and annual feasts. Local Action Groups have now been established since the 2007 – 2013 programming period, becoming reference points within their respective region, supporting and consulting with numerous regional actors. The 2007 – 2013 and 2014 – 2020 RDPs financed numerous projects that have improved life inrural areas, from the restoration of historical artefacts to the rehabilitation of open spaces and the resurfacing of rural roads. Rural areas on the main island of Malta remain popular for residential and touristic purposes, though depopulation remains a concern for Gozo.

The female employment rate in Malta has been invreasing over the past years, as outlined above, from 54.3% in 2014 to 69.6% in 2021.[182] Further efforts to increase the participation of women in the labour market shall be targeted through Cohesion Policy, mainly through the ESF+ programme.

Women are also significantly active within rural communites as volunteers, both within the agricultural sector itself but also within the community in general. Ample culture and historical assets can be found across the islands, inlcuding in rural areas. There is therefore scope for support through LEADER to continue improving such assets, which can then bring about regeneration in such areas.

[182] https://ec.europa.eu/eurostat/databrowser/view/LFSI_EMP_A__custom_3212189/default/table?lang=en

Weaknesses

The scale of impact of CAP income support remains below the average income

The underutilisation of historical and natural heritage and failure to conserve and invest in natural and historical assets and local cultural and historical knowledge has a direct impact on the level of diversification which can be undertaken in rural areas. In this regard, LEADER initiatives may prove critical for development in this regard.

Higher seasonality element in Gozo's economic activity (dependence on agriculture and tourism) and lack of diversification as well as emigration of young, highly skilled people from the island, represent relative weaknesses for Gozo. Number of women taking part in rural development activities remain low across Maltese islands.

Agriculture is not considered as profitable as other sectors, therefore, investment in the sector needs to be leveraged though EU funding. There is therfore limited entrapreneurial confidence in the agricultural sector.

Even though high speed broadband is readily available across all of Malta and Gozo, including in rural areas, a low levels of digital skills among rural population, especially the older farming population, remains challenging.

Opportunities

A younger generation of Maltese rural people is keen to encourage more innovative and creative enterprise in rural areas, drawing upon wider Maltese arts, crafts, technology and entrepreneurship to stimulate and help develop a new and broader vision for local action.

There are opportunities to stimulate new business activity and help support rural incomes and standard of living, including interventions such as farm diversification, gastro tourism, investment in cultural and natural heritage, and social inclusion, co-operation and knowledge transfer.

High level of visitors/tourism creates a large potential market for local products and activities. There are therefore opportunites for further development in this regard, for the benefit of the local agricultural sector and rural communities.

Feasibility studies on renewable energy using waste and development of bio-economy sectors on the islands, should create an opportunity to investigate wider use of renewable energy sources in the future.

Threats

Growing population, with some areas experiencing a high percentage of older people, is resulting in higher pressure on resources such as water, air and land as well as on local infrastructure.

Malta's population is an ageing one[183] and with older people (aged 65 and over) more at-risk of social exclusion or poverty, sustained effort is required to mitigate the situation.

Without a multi-pronged approach that mainly involves Cohesion funding and national programmes, but that may also include LEADER support, the high influxes of economic migrants may create social challenges, brought about by multiculturalism and a fast population growth rate.

Implications for needs and the case for intervention

There appear to be clear needs to improve the scope and scale of actions under this SO through new local development strategies which are tailored to today's needs and the needs of rural communities.

The focus of current LEADER activity on works for environmental enhancement needs to be enhanced so it can better address rural socio-cultural and environmental quality of life.

It would be possible to reinvigorate the LEADER agenda in this direction, with enhanced allocation tomultisectoral and business-oriented projects and initiatives designed to reverse negative stereotypes concerning rural and agricultural conditions and opportunities. However, there may also be important roles to be played by non-agricultural policies, especially those focusing on social, health and regional development meaning that careful demarcation and coherence need to be assured.

Outside the scope of the LEADER programme but also under this SO, the need for improving the rural road network remains, to improve accessibility for farmers, prevent land abandonment and thereby preventing a decrease in production that may have a negative impact on food security.

Thus, the needs under this SO are:

8.1 Support small projects within rural areas to foster local development
8.2 Promote and encourage community and social activities within rural areas.
8.3 Improve farm access to rural roads

Specific Objective 9: Improve the response of Union agriculture to societal demands on food and health, including high-quality, safe and nutritious food produced in a sustainable way, to reduce food waste, as well as to improve animal welfare and to combat antimicrobial resistance

Context and evidence

Antimicrobials play a crucial role in the treatment of diseases of farm animals and the safeguard of food security both in terms of quality and ensuring adequate supply. Farmers recognize the prudent use of antimicrobials for livestock as a means of safeguarding their produce and business. Nevertheless, the use of antimicrobials itself brings with it additional costs and impacts the well-being of farm animals and consequently human health if not applied in the right manner. Malta is not immune to the significant challenge of Antimicrobial Resistance (AMR); in common with most Mediterranean countries, several drug-bug resistance combinations are locally prevalent in significantly greater

[183] https://nso.gov.mt/en/nso/Media/Salient-Points-of-Publications/Documents/2021/Regional%202021/Regional%20Statistics%202021_full%20publication.pdf

proportions than other EU regions.[184] 'A Strategy and Action Plan for the Prevention and Containment of Antimicrobial Resistance in Malta 2020 – 2028 [185]' has been published as a cross-sectoral response to the threat of AMR in Malta with the aim of controlling and possibly reversing these current AMR trends.

Recent European reports cited in the Strategy[186] have provided new evidence on the burden of AMR in Malta. A 2019 ECDC publication estimates that 25 to 35 Maltese die every year from infections caused by AMR organisms (Cassini, et. al., 2019). OECD has also reported that AMR is resulting in direct costs of more than €3,000,000 a year to the Maltese economy. It estimates that, in a worst-case scenario, in which no antimicrobial treatment is effective, AMR infection could cause healthcare losses of more than 6000 hospital days, and almost 20 million euros, a year. AMR in animals is also a significant problem. The level of resistance to ciprofloxacin in Salmonella inlocal broiler flocks tested in 2016 was 50%, while 48.8% of the isolates were resistant to nalidixic acid.[187]

Animal welfare and prudent use of antimicrobials go hand in hand; one cannot exists without the other. In order to improve the prudent use of antimicrobials, the Competent Authority has undertaken several projects some of which are included below.

With regards to legislation, LN 179/2021 that amends S.L 437.47 was published in April 2021. It contains a number of provisions related to the prudent use of veterinary medicinal products, including antimicrobials. This legislation introduces new obligations for most stakeholders and corresponding fines in case of infringements. As from April 2023, all establishments where animals are kept are obliged to have Animal Health Plans, under the responsibility of a person qualified to do so by the Veterinary Surgeon Council (Regulation 79(2)). These legal provisions will allow effective enforcement and legal direction for all stakeholders, especially those who prescribe, dispense and administer antimicrobials. Guidelines regarding the new provisions on AMR have also been prepared. Other new laws have also been drafted by the Competent Authority, including a bill to change Chapter 437, The Veterinary Services Act. This will allow stepping up of enforcement and add powers to the respective Minister. These amendments, that are still being discussed by the legislators (July 2022) will impact: veterinary prescription, medicated feed, veterinary pharmacies, wholesale distribution of VMPs, role of the National Veterinary laboratory and powers to take enforcement action.

As regards education and awareness raising and education, several guidelines on antimicrobials or with an emphasis on antimicrobial use have been published on the Competent Authority website. These guidelines are based on the legislation (both national and EU) and also on good animal husbandry practice. The guidelines range from good biosecurity in farms and how to deal with the supply, use, disposal and records of veterinary medicinal products. Several leaflets have been published which are given directly to farmers during official inspections, disseminated during agricultural fairs, provided during informative/educative session and sent by post. They are also available on-line on the Competent Authority's website. The subjects include the importance of Animal Health Programmes, the use of veterinary medicinal products and the prudent use of antimicrobials in farms. All material used during the informative/educative sessions with farmers is made available on the website.

[184] A Strategy and Action Plan for the Prevention and Containment of Antimicrobial Resistance in Malta (2018 -2025) p.11; at: https://meae.gov.mt/en/Public_Consultations/MEH-HEALTH/Documents/AMR%20Strategy_FINAL_EN_%20Public%20Consultation_NOV2018.pdf

[185] Ministry For Health, Ministry For Agriculture, Fisheries & Animal Rights, A Strategy and Action Plan for the Prevention and Containmentof Antimicrobial Resistance in Malta (2020 – 2028)

[186] Ibid.

[187] Ibid.

A Disease Guidebook for pets has also been published. The Competent Authority is working with the assistance of its EU Counterparts to publish an antimicrobial treatment guideline booklet on the most common diseases in farm animals and the optimum treatment options.

To ensure dissemination of information, the Competent Authority has carried out various actions, including: merchandise provided free of charge during events, messages in pay-slips received by e-mail by public officers, newsletters sent to public officers, messages on the SMS/E-mails received by veterinary surgeons, and customers in the veterinary e-prescription.

With regards to the safe disposal of antimicrobials in the community, a system has been developed through the provision of wastebins for expired/unused VMPs. These wastebins have been provided in veterinary pharmacies and are emptied at regular intervals.

Collaboration with stakeholders is also prioritized, to ensure adequate outreach. Meetings with cooperatives have resulted in agreements for the organization of joint seminars for farmers concerning rules on AMR, which are included in agreements these cooperatives make with their members (e.g. quality of milk versus use of antimicrobials). One of the cooperatives included useful links to the Competent Authority's website on its social media channels, for ease of access to information. Physical training sessions with farmers have also been conducted. Collaboration extends also in the EU/international sphere. Malta has participated in the OIE antimicrobial sales data since 2012 and with ESVAC since 2017.

A Maltese language infographic about new important legal provisions emanating from Regulation (EU) 2019/6 has also been prepared in conjunction with the Federation of Veterinarians of Europe and can be found on the FVE website.

In Q4 of 2018 Malta published a consultation document on Antibiotic Resistance (AMR) that included a proposed strategy as well as a 6-year Action Plan to address the challenge of antibiotic resistance. An seminar was held in January 2019 which brought together key stakeholders in the implementation of the AMR strategy and action plan. This was also an opportunity for key stakeholders to discuss strategy action points relevant to their areas of interest and an opportunity to put forward suggestions and provide feedback about the Strategy during several workshops.

In order to improve surveillance, collaboration between different sections of the Competent Authority has intensified. An SOP which defines and explains this cooperation has also been updated. Collaboration had been enhanced, to enable better use of resources. Assessments of application for new or renewed VMP containing antimicrobials are being made in the light of the new legislative requirements, with unauthorized VMPs containing alleged antimicrobials were removed from the market.

With regards to training, continuous professional development and education, lectures related to AMR were delivered University and other students by officers of the Competent Authority. . Sessions were also held internally within the Competent Authority, with professionals, such as veterinary surgeons and pharmacists, and representatives of professional bodies (Veterinary Surgeons Council). The latter included compulsory continuous professional development to veterinary surgeons to maintain their warrant active. Discussions started with the University of Malta for the inclusion of specific lectures on AMR. Circulars concerning the new categorization of antimicrobial and other relevant subjects were sent to the relevant stakeholders. Officers from the Competent Authority participated in several TV programs which discussed AMR and various articles on the subject were also included in popular magazines which have wide readerships amongst key stakeholders (e.g. farmers). Contribution in these magazines has become regular.

antimicrobial Measures encouraging the use of the electronic veterinary prescriptions for all veterinary medicinal products, including antimicrobials were taken as soon as the electronic veterinary prescription was launched in November 2021. The electronic veterinary prescription is also envisaged to be an extremely important tool to collect data on the use of antimicrobials. This development aim to contribute towards address the main underlying causes behind the high AMR rates; the cause of which might be the result of a multitude of factors, including gaps in the legislation, poor biosecurity measures at farm level and lack of use of the veterinary prescription. Other challenges relate to the need to carry out necessary tests to identify causes of diseases as well as the identification of the optimum antimicrobial treatment antimicrobial with a view to avoid the spread of disease and encourage antimicrobial use in a targeted and efficient manner. Such testing would also allow effective monitoring which in return would enable more proactive efforts towards addressing AMR.

AMR surveillance in animals is carried out by the National Veterinary Laboratory on resistance of Salmonella species in poultry (layers and broilers) and swine as well as for E. coli under Decision 2013/652. Surveillance on bovine species reared in Malta is not compulsory because calves are not slaughtered. Other species such as rabbit, ovine and caprine are not targeted as this is not an EU requirement. National legislation allows for the slaughtering of small numbers of rabbits on farms without the presence of the official veterinarian on site. However, it does exempt the farm from being monitored if they are registered with the Food Safety Commission.

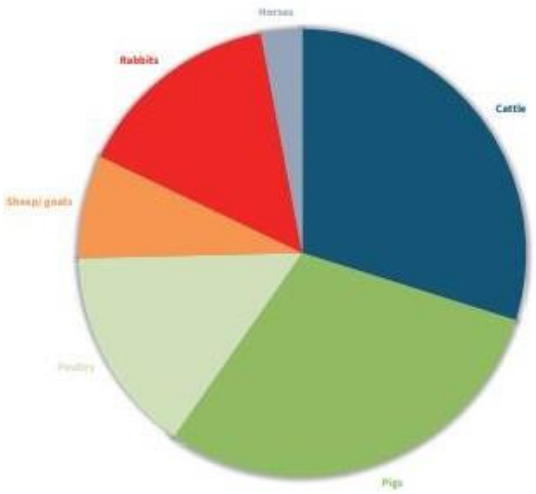
As identified in the AMR strategy, innovative technological solutions and research initiatives can be successful if they reach out to practitioners in the field and include experts from different disciplines and backgrounds. It is important to motivate stakeholders such as farmers, advisors and veterinarians to adopt better biosecurity, management and other practices that help reduce the need for antimicrobial treatments as well as to ensure better controls on prescriptions and the sales of antimicrobials.

The strategy outlines plans for a surveillance system to monitor antimicrobial usage in agriculture and other sectors, and calls for improved hygiene standards on farms to prevent cross-transmission of animal pathogens. It also proposes to expand educational Animal Health campaigns aimed specifically at farmers, animal and pet owners emphasizing the risks of non-prescribed use of antimicrobials or acquisition of antimicrobials from unlicensed sources, as well as the benefits and cost-effectiveness of greater hygiene.

The Veterinary Medicine Antimicrobial 2017 (Figure 9.2) summary report presents data on the sales of veterinary antimicrobial agents for the year 2017 and places emphasis on food-producing animals. According to the report the sales of antimicrobial veterinary medicinal products in Malta, expressed as mg sold per population correction unit (PCU), was 121mg/PCU for 2017. The EU average, as stipulated in 2016 ESVAC Report, was 124.6mg/PCU with a range from 2.9 mg/PCU to 453.4 mg/PCU across the 31 countries [188].

Figure 9.3: Estimated PCU (in 1,000 tonnes) of the population of food-producing animals, for 2017

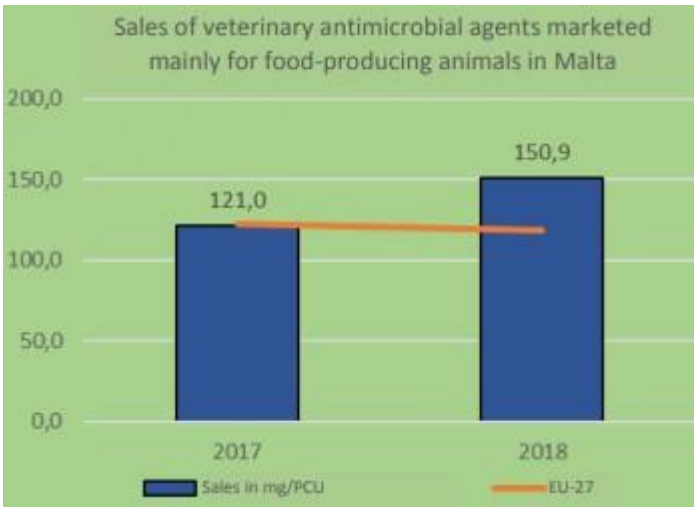
[188] National Antimicrobial Committee: Antimicrobial Consumption and Resistance in Malta Annual Report 2019 https://deputyprimeminister.gov.mt/en/nac/Documents/NAC%20Annual%20Report_2019_VH_OP_WEB_LR.PDF



Source: Antimicrobial Consumption and Resistance in Malta 2019

In 2018, the total sales of antimicrobial VMPs in Malta were 150.9 mg/PCU (Figure 9.4). Pleuromutilins,tetracyclines and other antibacterial were the most-sold classes, accounting for 29%, 26% and 18%, respectively, of the total sales of antimicrobials (mg/PCU) for food-producing species, including horses. In Malta, sales (mg/PCU) of 3rd- and 4th-generation cephalosporins, fluoroquinolones, other quinolones and polymyxins represented 0.1%, 3%, 0.02% and 1.2%, respectively, of total sales in 2018. In the same year, sales of 3rd- and 4th-generation cephalosporins were 0.19 mg/PCU and sales of polymyxins were 1.85 mg/PCU.

Figure 9.4 Sales of veterinary antimicrobial agents marketed mainly for food-producing animals in Malta.



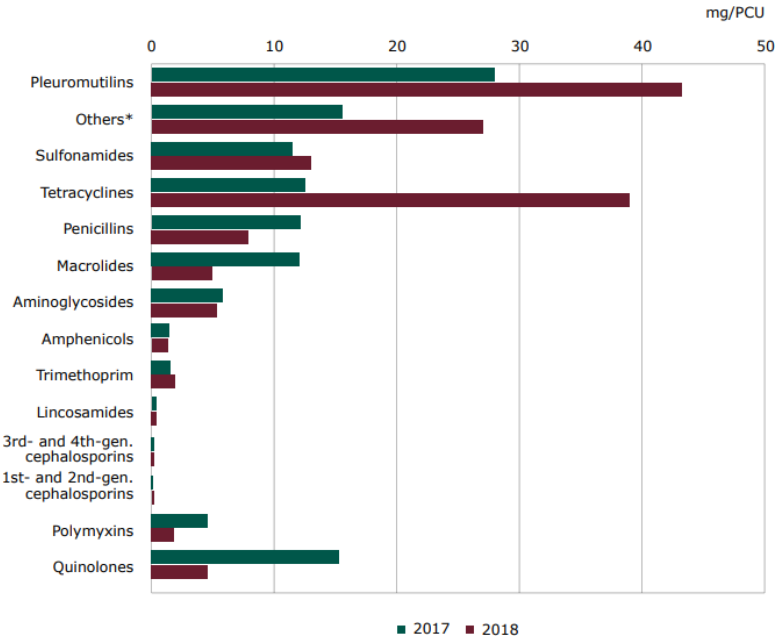
Source: European Medicines Agency[189], European Surveillance of Veterinary Antimicrobial consumption (ESVAC). Sales of veterinary antimicrobial agents in 31 countries in 2018 – trends from 2010 to 2018 Tenth ESVAC Report. EMA/24309/2020.

In 2018, sales of veterinary antimicrobial agents were reported to the ESVAC for the second time. Data were provided by 23 wholesalers. A 25% increase in sales (mg/PCU) was observed in Malta from 2017 to 2018 (Figure 9.5). This increase should be interpreted with caution as it was the result of this being the first two years of collecting data using the ESVAC template, bearing in mind that the overall sales, in tonnes, can fluctuate from year to year [190].

[189] European Medicines Agency, European Surveillance of Veterinary Antimicrobial consumption (ESVAC). Sales of veterinary antimicrobial agents in 31 countries in 2018 – trends from 2010 to 2018 Tenth ESVAC Report. EMA/24309/2020.

[190] https://www.ema.europa.eu/en/documents/report/malta-trends-sales-veterinary-antimicrobials-between-2010-2018_en.pdf

Figure 9.5: Changes in sales (MG/PCU) across years



Source: EMA Malta-trends-sales-veterinary-antimicrobials-between-2010-2018

Malta recognises many ways in which farming and agricultural policy can and should promote a better relationship between Maltese agriculture and the provision of safe, nutritious and healthy food for consumers, as well as a more sustainable food system with less waste and greater resource protection. The welfare of farm animals is an important consideration in the relatively intensive systems which characterise much of Maltese livestock production, and there is scope for continuous improvement in this respect.

According to the European Commission, European consumers are becoming increasingly interested in information on how animals are treated on farms and in livestock facilities. However, while voluntary welfare labelling schemes exist across the EU, there is no harmonised system of animal welfare[184] standards for labelling purposes. Across the EU, the only existing system of compulsory labelling concerns table eggs, that are regulated through EU legislation for laying hens, based on the different production methods, such as cage and free range. Such classification does not exist for other types ofanimal and animal products.[191]

Because of this, few products currently provide information to the Maltese consumer on welfare standards and there is little motivation for producers to improve animal welfare above the regulatory minimum and market their products accordingly. In this regard, the CAP SP will support animal welfare measures in a direct manner with a view to reverse this trend.

Dietary and health issues

Dietary and health issues in Malta are targeted primarily through other, non-CAP policies, including through a combination of national and EU funds. Malta has high prevalence of overweight and obesity. In Malta, the prevalence of overweight was 70% in adults aged 18-70 years in 2014- 65, and 37% of men and 31% of women were obese (Cuschieri et al, 2016). This shows a clear need for the promotion

[191] European Commission, Labelling related to animal welfare, available at: https://ec.europa.eu/food/animals/welfare/other_aspects/labelling_en (accessed on 30 March 2020).

of healthy eating and healthy ageing habits amongst the Maltese population as well as a shift towards increased physical activity.

As explained by the World Health Organisation (WHO) in its State of Health report on Malta (2019), Malta's main health determinants in relation to dietary risks include, low vegetable and fruit intake, and high sugar and salt intake, tobacco and alcohol consumption and low physical activity. The main determinants are linked to the shift from a balanced Mediterranean diet to more of a fast food based diet as well as to limited physical activity. The promotion of healthy eating is being addressed holistically at the national level and primarily through measures foreseen under the Draft National Health Systems Strategy for Malta 2020-2030 (2021). The latter foresees the promotion for of healthy school lunches and a family-based approach to healthy eating, amongst others. As outlined in the same strategy, poor eating patterns and a higher propensity towards risk-taking behaviours are commoner in adolescents from families with lower socio-economic and educational backgrounds. In this regard, dedicated programmes to target such adolescents are foreseen to be implemented outside of the scope of the CAP SP. Such programmes will adopt a comprehensive approach involving collaborations between the health, education, social and youth sectors, amongst others. Considering the high incidences of obesity in children and youths, Government enacted legislation outlining measures related to food procurement and the promotion of healthy eating in schools (LN 266/2018).

Complementarity can be noted between this Specific Objective and the school fruit, vegetables and milk scheme that supports the distribution of these products in schools, with a specific focus also on health, educational and information measures. These schemes aim to increase the consumption of fresh fruit, vegetables and milk products among children, therefore promoting the consumption of healthy food. In addition, The 'Healthy Plate' guide targets Maltese adults aged 19-65 years who are encouraged to modify their daily diet to reflect the proportions indicated by the graphical 'healthy plate' guide[192]. These efforts will aim to sustain a new generation of healthy eating and active living for an improved quality of life.

Malta's Health Ministry in 2020 undertook a nationwide survey of consumption patterns in Malta, which highlights the seriousness of the obesity problem in the country and indicates a strong link to poor diet, in particular high levels of sugar consumption in processed foods and drinks. The Ministry will use the publication of the findings of the survey to promote a range of new policies encouraging Maltese people to choose a Mediterranean diet with a higher proportion of fresh fruit and vegetables and a lower consumption of highly processed foods. This publication will coincide with the development of a new food and nutrition action plan.

The promotion of animal welfare standards coupled with the introduction of animal welfare measures could also enable a shift towards higher animal welfare standards to benefit livestock, farmers and consumers on the Maltese Islands alike.

The idea of the circular economy and the need to reduce food waste is also particularly relevant to Malta, given its island status, high population density, high import dependency, and limited, precious and fragile natural resource base. Malta's Long Term Waste Management Plan 2021-2030 describes the significant challenges facing the Maltese economy in seeking to reduce, re-use and recycle more of its waste, and the agri-food sector can play its part in this process. The Long-Term Waste Management Plan 2021-2030 prepared by the Ministry for the Environment, Climate Change and Planning provides a road map to maximise the resource value in waste through different management

[192] Dietary Guidelines For Maltese Adults Information for Professionals involved in Nutrition Education 2014 available at https://deputyprimeminister.gov.mt/en/health-promotion/Documents/library/publications/Dietary%20Guidelines%20for%20Professionals%20final.pdf

options;

- Innovate by designing waste prevention initiatives to lower Malta's per capita generation rate;
- Reform the collection system to increase economies of scale, harmonise collection practices and modernise the collection fleet;
- Build the necessary waste management facilities to treat recyclable, organic and residual waste to achieve Malta's targets;
- Study the feasibility of an enhanced producer responsibility framework to complement Malta's transition to a circular economy and reflect further on the true cost of waste management; and
- Promote further the involvement of the private sector in waste management.

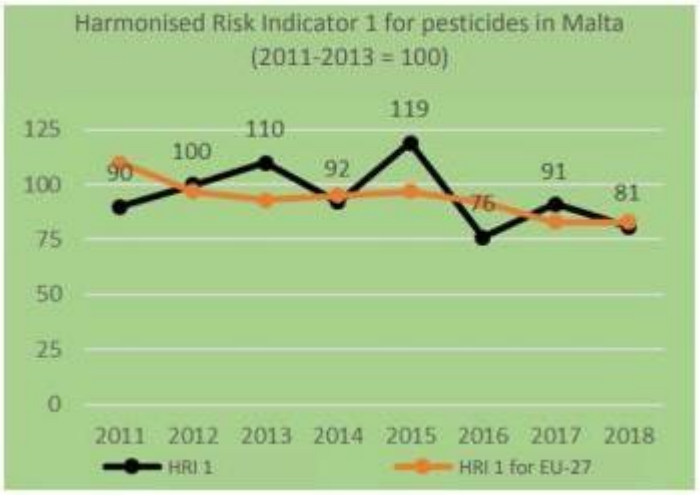
Whilst food wastes arising from producers and supply chain actors are considered as commercial wastes, their safe recycling might best be co-ordinated with the proposed 'community composting' for municipal biowastes, in areas around Malta.[193] Such activities could also create opportunities to produce soil enhancers and organic fertilisers, to be made available to farmers in order to reduce their reliance upon imported and chemical fertilisers, as already discussed under Specific Objective 4 and Specific Objective 5.

Pesticide usage (more on pesticides under SO 6) in Malta follows the typical pattern of the Mediterranean climate. Herbicide applications are mainly used in the beginning of the rainy season, which starts in September, when the weed seeds begin to sprout. Treatment with herbicides reached its peak in January whereas dry conditions in the April/September season retard weed growth. Fungicide use occurred throughout the whole season, with the main period of application occurring April to July, reaching a peak in June.

In 2014, according to the Pesticides Use Survey, carried out by the National Statistics Office (NSO), the area treated with plant protection products amounted to 4 071.8 hectares or 44.4% of the area surveyed. With higher shares of area treated for vegetables and potatoes (above 90%), vines (86%), stone fruit (78%) and citrus (45%) 119. Harmonised risk indicator 1 (HRI1) (Figure 9.6) shows a 19 % decrease in risks linked to pesticide use in 2018, compared to the baseline period 2011-2013. Although this reduction of risk was slightly higher than the EU average of 17 %, the use of more hazardous pesticides (candidates for substitution) was high and increasing as a percentage of total pesticide sales.

[193] Long Term Waste Management Plan 2021 – 2030. https://era.org.mt/wp-content/uploads/2022/02/Long-Term-Waste-Management-Plan-v1.4.3-Spreads-Digital-Version.pdf

Figure 9.6 Harmonised Risk Indicator 1 for pesticides in Malta (2011-2013=100)



Source: European Commission. Harmonised Risk Indicator for pesticides (HRI 1), by group of activesubstance. EUROSTAT [SDG_02_51]

Malta's first National Action Plan (NAP) for Sustainable Use of Pesticides[194] covering the period 2013-2018, set out a national strategy and established objectives, targets, measures, and timelines to reduce risks and impacts of pesticide use on human health and the environment, whilst encouraging Integrated pest management and alternative approaches or techniques to reduce pesticide-use dependency. This plan was updated in 2019 [195]. However, based on the Commission's assessment of the SUD implementation, Malta lacks enforcement of the general principle for integrated pest management at farm level.

Through the setting up and enhancement of an electronic prescription system, the competent authority will be able to collect better data on the prescribing, dispensing, use, and consumption trends of antimicrobials, at the level of the species. Such data will enable the competent authority to monitor the situation and issue specific guidelines for veterinarians, aimed at better addressing the use of antimicrobial agents. In the long run, and together with other actions outlined in the respective strategy, such as targeted information campaigns, this system is expected to reduce the use of antimicrobials in farming.

Complementing this electronic veterinary prescription system, investment in the modernisation of the National Veterinary Laboratory for AMR testing is also expected to be supported. Such upgrades in relation to AMR will enhance the testing capabilities of the laboratory and will allow for the introduction of molecular biology techniques which will enable the swift identification of pathogens on farm animals, enabling the improvement of treatment options and the quality of veterinary care. Such testing capabilities are currently limited and testing often needs to be carried out overseas, resulting in delayed identification of pathogens that leads to delayed treatment or the use of less optimum and targeted antibiotic use. These enhancements will therefore result in more timely, better targeted treatment and a reduction in the reliance of a high use of antibiotics.

Strengths

As mentioned also under Specific Objective 2, consumer awareness of Maltese products has been

[194] Malta's National Action Plan for Sustainable Use of Pesticides 2013 – 2018,https://mccaa.org.mt/media/1154/nap-mt.pdf
[195] Malta's National Action Plan for the Sustainable Use of Pesticides 2019-2023 https://mccaa.org.mt/media/3518/nap-for-the-sustainable-use-of-pesticides-2019-2023-for-public-consultation.pdf

enhanced in recent years, also through the development of a range of Maltese restaurants by chefs enthused tocreate and promote their national and regional specialities.

Both the Ministry for Agriculture, Fisheries, and Animal Rights and local NGOs are working towards creating more awareness about the benefits ofsupporting the local agricultural sector through seasonal consumption of fresh Maltese produce.[196]

Efforts have also been made within the Agriculture Directorate to establish a national register of traditional Maltese Agro-Food products through Subsidiary Legislation 427.89; Establishment of the National Register of Traditional Agro-Food Products Of Malta Regulations [197], as well as a national committee that acknowledges the culinary and cultural significance of local products such as the '*Gbejna*'. The register shall aim at officially recognising agricultural products and traditional recipes as Maltese cultural heritage. A public consultation was launched regarding this matter; and its outcomeawaits publication.[198]

Strong antibiotic stewardship programmes (including guideline development) in hospital care, especially at the main hospital in Malta- MDH and extensive surveillance data on antimicrobial resistance in governmental hospitals. Strict legislation is also in place, restricting the sales of antibiotics for human consumption, when this is not prescribed by a doctor.

The recently launched *A Strategy and Action Plan for the Prevention and Containment of Antimicrobial Resistance in Malta (2020 – 2028)* outlines actions aimed at targeting this important threat, coupled with legislation on the enforcement of prescription mechanism related to the sales of antimicrobials.

Efforts are being undertaken by the respective Competent Authority to promote the use the electronic veterinary prescription system, amongst stakeholders including livestock cooperatives, livestock breeders and veterinarians.

Weaknesses

Low consumer awareness of how the food is produced, particularly in Malta's large hospitality sector, is likely to weaken the prospects for developing and maintaining market advantage through an explicit link to quality and higher standards. This weakness would need to be addressed by much stronger promotion and education of the public and of the main hospitality sector providers, in tandem with action along the agri-food chain.

High level of food waste in the hospitality sector needs to be adressed, since this creates a waste problem that needs to be dealt with at disposal stage.

High level of plant protection products use is detrimental to both consumers and the environment, in view of their impact on water, soil and bidiversity. Efforts to reduce the use of such PPPs, such as through organic farming and implementing an IPMP on the holidng remain important.

Information on AMR in isolatesof animal origin remains sparse and restricted to a limited set of

[196] Friends of the Earth Malta, https://foemalta.org/
[197] Establishment of the National register of Traditional Agro-food Products of Malta Regulations, http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=12266&l=1
[198] Public consultation on the National Register of Traditional Agro-Food Products of Malta https://meae.gov.mt/en/Public_Consultations/MAFA/Pages/Consultations/PublicconsultationontheNationalRegisterofTraditionalAgroFoodProductsofMalta.aspx

isolates tested annually at the National Veterinary Laboratory in compliance with Commission Implementing Decision 652/2013(EU). There are currently no laboratories in Malta that can provide a suitable service for performing routine diagnostic and susceptibility tests,[199] hence scope for development in this area remains important. The number of veterinarians targeting farm animals is also significantly limited.

Current legislation requires that all antibiotics used for human patients (including topical formulations) as well as food animals, should be Prescription Only Medicines[200]. In animal health, legislation on the enforcement of prescription mechanism related to the sales of antibiotics is now in effect. . Detailed information on antimicrobial use in animals in Malta remains limited. Malta started providing sales data of antimicrobials to the European Medicines Authority's European Surveillance ofVeterinary Antimicrobial Consumption (ESVAC) network only in 2018.

Limited analysis on biosecurity at farm level and application of effective measures by farmers may result in less disease prevention, therefore leading to the spread of disease and therefore more antimicrobial use to treat infected animals.

The uncontrolled way in which antimicrobials can be procured and used by farmers needs to be addressed as to decrease the use of antimicrobials.

High volume of antimicrobials sold without prescription also requires addressing, to address AMR. The use of antimicrobials needs to be better targeted, as prescribed by veterinarians.

Other weaknesses have been identified and will be addressed through the national AMR strategy, including gaps in the national legislation that thwart effective enforcement action, limited awareness on risks associated with imprudent use of antimicrobials and how impudent use in animals can effect human health.

Opportunities

Increased awareness and demand for organic farming brings with it increased opportunities for farmers to convert their holdings to this agronomic practice to address market needs, despite the fact that achieving such status in Malta is a rather laborious process, in view of local geophysical, topographic and climatic barriers.

In livestock sectors there is an opportunity to improve animal welfare and enhance the five freedoms, (namely freedom from hunger and thirst; freedom from discomfort; freedom from pain, injury and disease; freedom to express normal behaviour and freedom from fear and distress) for all housed livestock in Malta, also to develop new welfare standards and certification, in partnership with key supply chain actors.

Development of a new holistic food policy that targets the entire food ecosystem and fosters the enabling conditions for more robust and resilient food systems will aim to influence the behaviour of producers and consumers in the food chain and address a number of needs linked to higher environmental and animal welfare standards, including organic farming, enhancing quality,

[199] Ibid.
[200] Ministry For Health, Ministry For Agriculture, Fisheries & Animal Rights *A Strategy and Action Plan for the Prevention and Containment of Antimicrobial Resistance in Malta (2020 – 2028)*

traceability of local produce and raising consumer awareness.

There are also further opportunities to further support and promote agronomic practices aimed at reducing the use of PPPs, through supporting schemes such as organic farming and the implementation of IPMPs on the holding, in order to expand the implementation of such practices for the benefit of the consumer and the environment.

There is also scope for the promotion of healthy, sustainable diets based on seasonal local products with a low carbon footprint. The consumption of local produce ensures that local farmers can remain in business and can further invest in the sustainability of their holding.

There is a scope to enhance knowledge and awareness on AMR among veterinary professionals by ensuring the availability of continuing professional education activities on AMR and targeted use of antimicrobials in line with the Strategy and Action Plan for the Prevention and Containment of Antimicrobial Resistance in Malta 2020 – 2028 [201].

Campaigns as part of the Long-Term Waste Management Plan 2021-2030 , on food waste awareness provide an opportunity to focus on the importance of consumption in a sustainable manner, both for the environment and people's well-being [202]. Food wastage accounts for 52.1% of municipal solid waste in the Maltese Islands.[203]In line with the United Nations Sustainable Development Goal 12.3 to halve per capita food waste by 2030, and the European Union Waste Framework Directive, where member states should send no more than 10% of municipal waste to landfill by 2035, Malta launched a successful nationwide household organic waste project that supported Malta's progress towards achieving the above goals. Building upon previous nationwide awareness raising campaigns *Don't Waste Waste* and *Sort it Out*, steps are taken to prevent food waste in Malta across various stages of the food supply chain, ensuring correct source segregation of food waste, and investing in facilities to ensure resource recovery of food waste (Waste Management Plan 2021-2030).

Threats

There is still lack of consumer awareness on the need to sustain the local agricultural sector by purchasing local produce. This may also be a consequence of limited labelling and traceability, given that consumers do not have the necessary certainties with regards to the provenance of fresh produce. Lack of consumer awareness and lack of recognition towards the value of Maltese products is a continuing threat that must be tackled by promotion and education. Coupled with this is the threat arising from **l**ow environmental awareness among the Maltese population, especially in respect of how it treats agricultural and organic waste.

With regards to recognition towards the value of Maltese products, further effort is required to encourage local consumers to recognise the importance of supporting such products.

Reluctance of farmers to change practices and adopt new technologies. Risk averse farmers may not take up unproven techniques and technology easily. Besides, poor confidence in the profitability of the farming sector and other external factors could make farmers even less willing to accept the risks associated with the testing and adoption of new practices and/or technologies.

Poor confidence in the profitability of the agricultural sector limits entrepreneurship and investment

[201] Ministry For Health, Ministry For Agriculture, Fisheries & Animal Rights *A Strategy and Action Plan for the Prevention and Containment of Antimicrobial Resistance in Malta (2020 – 2028)*

[202] Long Term Waste Management Plan 2021 – 2030. https://era.org.mt/wp-content/uploads/2022/02/Long-Term-Waste-Management-Plan-v1.4.3-Spreads-Digital-Version.pdf

[203] Vella, D.2016 Analysing household food waste in the Maltese islands; bachelor Thesis, University of Malta

in the sector and inhibits generational renewal which in turn limits the long-term sustainability of the sector.

There is an absence of appropriate legislation in Animal Health providing tools for effective intervention and regulation, especially in food animal husbandry.

Implications for needs and the case for intervention

Other areas of Maltese policy and other government Ministries play specific roles in respect of promoting food and health connections, as outlined in the Malta Food and Nutrition Policy.

Training and advice for farmers and supply chain actors to promote higher standards in these areas would seem to be an essential element, but equally important is to consider how to create a strong incentive for farmers to take up such training, if offered. Persuasion via the key co-operatives is one important means to achieve this, but conditions on broader farm support and/or stronger strategic action planning between Government and with all key farm sectors could also be valuable, in this regard. As demonstrated effectively via the experience of other Member States, when governments partner with industry lead organisations it can be possible to achieve sector-wide transformation of production standards more rapidly and effectively than if either public or private sector actors were to try to do this alone.

To make an effective link between consumer loyalty to local products and animal welfare benefits, agricultural producers need to be more engaged in developing and promoting higherstandards in production, including lower input and more agro-ecological practices, in particular, including those which can avoid or reduce the use of antibiotics in farming. Key to achieving this will be stronger education and awareness raising among the farming community, as well as capacity- building to promote innovation in these directions. There is also scope for investment support for equipment that improves animal welfare on the farm.

Availability of analytical and diagnostic tools would allow introduction of effective vaccination programmes and targeted use of antimicrobials. Supporting investments to set up an electronic prescription system enabling the monitoring and collection of quality data on the prescription, use, consumption and trends of antibiotics in Malta would be an important step towards fulfilling specific action in Strategy and Action Plan for the Prevention and Containment of Antimicrobial Resistance in Malta (2020 – 2028). The data would be used to carry out risk assessments and to complete the pictureand assist in implementing the strategy in Malta. Support may also include upgrades to the AMR laboratory.

Thus the needs under this SO are:

9.1 Foster higher animal welfare standards to ensure wellbeing among farmed animals;
9.2 Introduce new measures aimed at reducing, reusing and recycling food waste along the supply chain;
9.3 Promote products produced to higher standards for environmental and animal welfare;
9.4 Provide support for farmers to invest in improved animal welfare measures;
9.5 To reduce the use of antimicrobials;
9.6 Enhance quality transparent environmental and animal welfare standards to increase traceability.

Specific Objective 10: Cross-cutting objective related to modernising agriculture and rural

areas by fostering and sharing knowledge, innovation and digitalisation in agriculture and rural areas and by encouraging their uptake by farmers, through improved access to research, innovation, knowledge exchange and training

Context and evidence

Under the 2014-2020 period, Malta committed to strengthen knowledge transfer and innovation in agriculture trough training and advisory initiatives and address some of the problems mentioned above. Malta programmed 8.2% of the total rural development under Measure 1 (M.01) (knowledge transfer and information actions, to which 3.4% of the envelope is programmed), M.02 (advisory services, farm management and farm relief services, to which 1.9% of the envelope is programmed) and M.16 (Co-operation-European Innovation Platform, to which 2.9% of the envelope is programmed). This figure was the highest in the EU, where the average amounts to 3.6% (Commission recommendations for Malta's CAP strategic plan 2020). In terms of implementation, however, Malta has so far spent a very small percentage of the funds programmed.

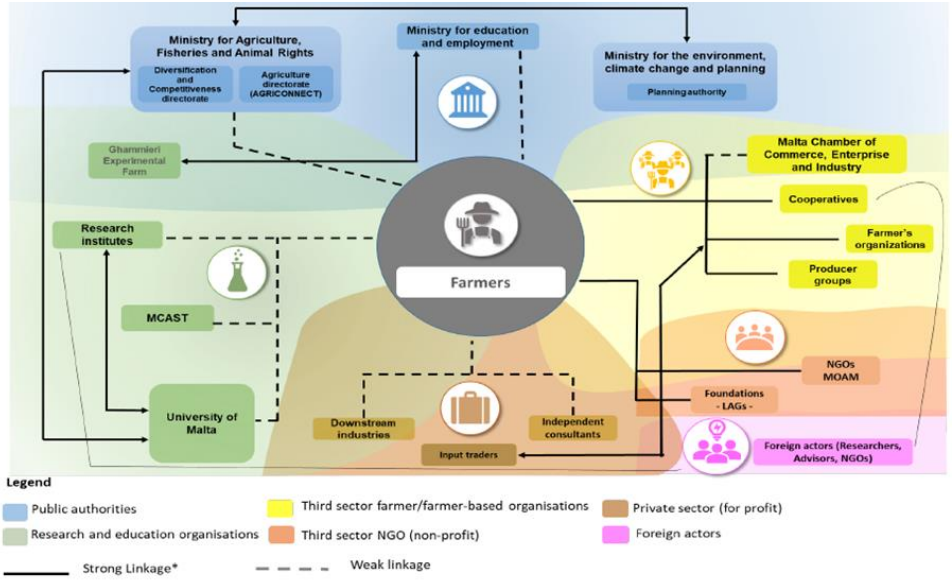
Agricultural Knowledge and Information Systems (AKIS) is the management of people, entities and institutions that use and generate knowledge and innovation for the sector. The main players are farmers, farmers organisations, researchers, advisors, public entities, processors and retailers, amongst others. AKIS aims to create a thriving network through which knowledge can be disseminated between the different actors, while also enhancing the links between researchers and practitioners.[204] The PRO-AKIS study[205] (2015) classified the Maltese Agricultural Knowledge and Innovation system as fragmented.

According to a recent i2connect report (2020)[206], AKIS in Malta is characterised by "*a small number of actors with a low level of coordination and a lack of systemic vision".* Farm advisory services are provided by few private, mostly farmers'-based organizations and one governmental body (AgriConnect), which present different degree of integration and approaches within the local AKIS and a clear distribution of competencies on advisory topics.

I2connect report (2020) further states that "*Research, education and vocational training are mainly concentrated within two public organisations, which also contribute to the definition of R&I and education programs at national level. Both have remarkably improved their activities in the last years. However, despite some efforts in strengthening relationships with other AKIS actors, there is still a gap between the Maltese research and education world and the agricultural and rural community, which is particularly evident in the lack of qualified advisory services on the island".*

Figure 10.1 AKIS diagram

[204] AKIS, Advice and Innovation Networking, available at: https://scar-europe.org/images/CASA/National_Presentations/PT/Mirror_Group_Meeting_05-02-2019/AKIS_CAP_post-2020.pdf (accessed 29 April2020)
[205] Knierim, A. and Prager, K. Agricultural Knowledge and Information Systems in EUROPE – weak or strong, fragmented or integrated?. July 2015. PRO-AKIS, https://scar-europe.org/images/AKIS/Documents/report-preparing-for-future-akis-in-europe_en.pdf (accessed 17 December 2021)
[206] Cristiano, S. et al. 2020 AKIS and advisory services in Malta Report for the AKIS inventory (Task 1.2) of the i2connect project (HORIZON 2020).



Source: AKIS and advisory services in Malta Report for the AKIS inventory (Task 1.2) of the i2connect project (2020)

Maltese agriculture comprises a very large number of individual actors managing often very small agricultural holdings with relatively low levels of formal qualification.

The current knowledge transfer and advisory set-up in Malta comprises different actors that are involved in some cooperation projects together but whose efforts need to be better coordinated. These include:

- Malta College for Arts, Science and Technology (MCAST)
- Malta Council for Science and Technology (MCST)
- University of Malta (UM)
- The Diversification and Competitiveness Directorate (DCD) in the Ministry for Agriculture, Fisheries and Animal Rights (MAFA) Farm Extension Services
- MAFA's in-house, accredited Farm Advisory Service, AgriConnect.
- numerous private advisors.

AgriConnect and AgriHub have both been set up recently and are an example of coordinated approach to linking more closely research and advisory service provision in Malta. While Agri Hub's focus is onResearch and Development, the extension and advisory services are operated under AgriConnect. AgriConnect was established in 2020, as one-stop-shop advisory service for farmers. The AgriConnecthas been established to act as the Government's Farm Advisory Service provider for Malta to providea free and holistic advisory service which ensures that farmers in Malta and Gozo have access to the qualitative technical support which they need. AgriConnect offers a number of services:

- Consultancy regarding the adherence to the requirements resulting from Cross Compliance (CC) Requirements. This consists in on-site visits to Land, Livestock and Farm, provision of reports to farmers on the findings of the visit and development of crop plans and fertiliser

plans based on soil testing. Nutrient Management Plans and Assistance for record keeping are also offered.

- Crop compensation calculations for loss of agricultural land. AgriConnect caters for the issuing of crop compensation losses in cases where Agricultural land is lost due to infrastructural projects or in cases where land is expropriated by a Government entity.
- Advisory service on Soil Management Plans (SMP): AgriConnect caters for the issuing of crop compensation losses in cases where Agricultural land is lost due to infrastructural projects orin cases where land is expropriated by a Government entity.
- Organisation and delivery of training to farmers on the use of Plant Protection Products (PPP), use of Nitrates, and obligations linked to the Agri Environmental Climate Measures (AECM).
- Front office services where farmers have access to all the service and schemes offered and accessible through the Agriculture Directorate.

AgriHub, supports innovative agriculture applicative research and implement pilot projects using the latest technology to test technologies that can provide support to farmers to help with their decision-making process. AgriHub activities aim at creating the required framework and platform to support Malta agriculture sector through research, which generated knowledge can be communicated and disseminated through.

The support to farmers will be provided through the development of guidance documents from the data and information gathered through the pilot projects but also through the establishment of demonstration sites for farmers on integrated production using precision agriculture and the production of good quality fodder for livestock. AgriHub is a collaboration between the International Center for Advanced Mediterranean Agronomic Studies (CIHEAM), the Malta College for Arts, Science and Technology (MCAST) and the Ministry for Agriculture, Fisheries, Food and Animal Rights in Malta.

Training and advice needs among Malta's farm and rural population are significant. Many farmers lack formal technical training in agronomy or agricultural business management: many farms are managed on a part-time basis and management practices are learned informally from parents or other relatives.

Continuous professional development opportunities related to both technical matters and business development skills and knowledge need to be improved. Around 90.15% of the 11,713 sole holder managers identified in the 2010 Farm Census, only received agricultural training in the form of practical experience. Additionally, 8.6% of these sole holder managers, equivalent to 1,004, had received basic training and only 1.3% or 149 had full training in agriculture. Sole holder holdings madeup 90.7% of the total annual work units in agriculture. There is therefore a need for improved and continuous training opportunities for farmers.

Throughout the years, Rural Development Programmes have provided training courses and advice for farmers, especially in relation to cross compliance and other environmental obligations, farm management, on-farm hygiene and health and safety. Training and advice focusing on the implementation of specific agri-environment-climate measures have also been provided. Therefore, sporadic training activities have been held throughout the years, complemented by training on the use of pesticides and fertilizers organised and delivered by the respective competent authorities. By

supporting AgriHub and AgriConnect Agriculture Directorate aims at providing "one -stop- shop" for farmers in respect of technical advice.

Meanwhile, the Malta College for Arts, Science and Technology runs a number of courses, including degrees, related to horticulture and animal husbandry, amongst others. These courses are complemented by a number of evening courses on topics such as beekeeping, organic farming and viticulture. There is therefore opportunity for these efforts to be consolidated and enhanced, also through lessons learnt from the previous programming periods. MCAST is well-connected within the local AKIS and, acts as a mediator between the multitude of internal and external knowledge players. It shows an increasingly farmer-oriented and systemic approach aimed at solving practical issues of local agricultural development, such as the management of water resources and the valorisation of local products.

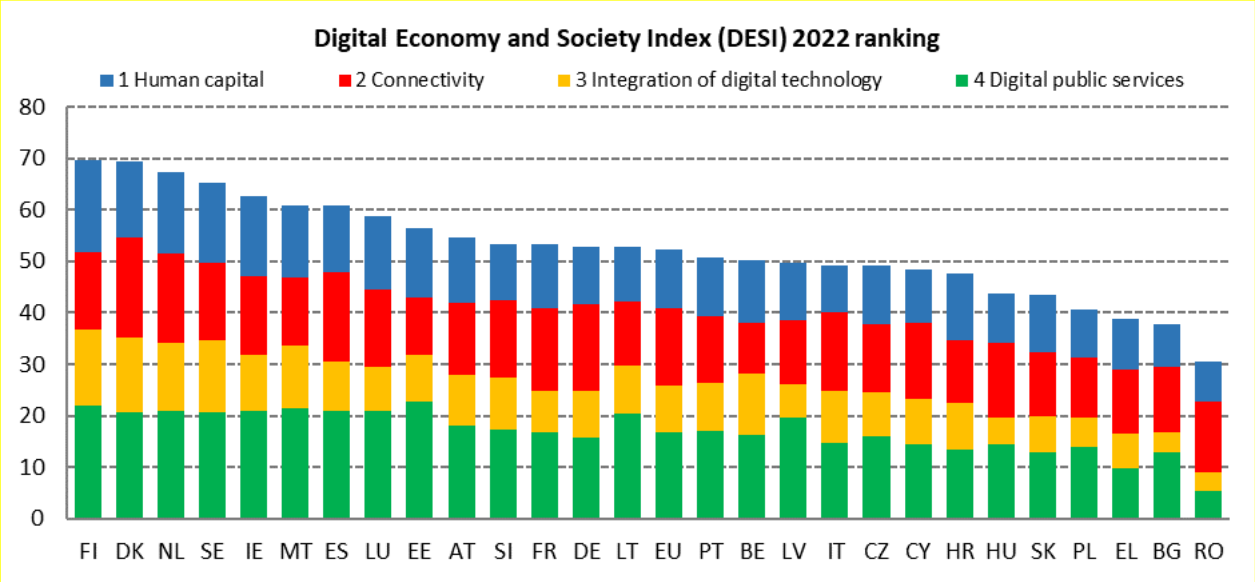
Opportunities for growth can be created through AKIS, through for example, digital reskilling and training, widening participation, engaging groups of people in rural areas who are still educationally excluded and socially disadvantaged through training, lifelong learning activities, and creating local knowledge hubs. As a network-oriented organisation, the CAP Network may also be involved within the local AKIS, following its setting up after the adoption of the CAP SP. There are also opportunities for complementarities with other funding streams, such as the European Social Fund.

The new programming period, therefore, offers a valuable opportunity to strengthen the farm sector's awareness of the need to plan, deliver and then demonstrate to Maltese consumers that local produce can better meet their concerns for environmental protection and animal welfare. Training and advice for farmers and supply chain actors to promote higher standards in these areas isimportant, but equally important is to consider how to create a strong incentive for farmers to take up such training, if offered.

Training and information needs are relevant to many Specific Objectives of the CAP Strategic Plan, ascovered in the respective SWOTs. AKIS is therefore a cross cutting issue that needs to target the economic and environmental sustainability of the farming sector. Training, advice, research, innovation and cooperation need to be enhanced in order to ensure viability of the farming sector, enhanced cooperation, improved quality standards, adaptation and mitigation to a changing climate, more sustainable use of natural resources, protection of biodiversity and enhanced farm hygiene and animal welfare, as also explained in Section 8 of the CAP Strategic Plan.
In respect of digitalization Malta ranks 6th out of 27 EU Member States in the 2022 Digital Economy and Society Index (DESI)[207], maintaining its rank from 2021 (Figure 10.2) .

[207] https://digital-strategy.ec.europa.eu/en/policies/desi

Figure 10.2 DESI ranking according to MS



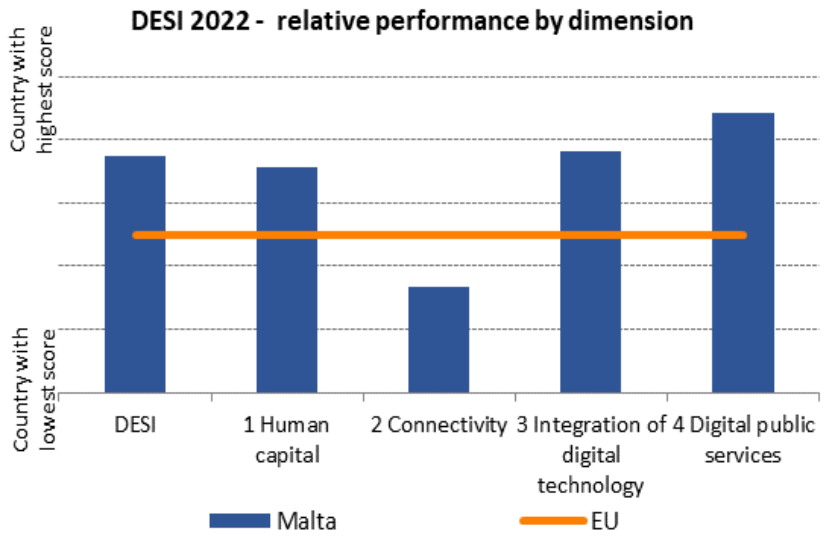
Source: DESI 2022, country report Malta

According to the DESI report (2022) Malta made good relative progress as regards the overall level of digitalisation of its economy and society, and maintained a comparatively high rank within the EU over the last five years. Between 2017 and 2022, Malta's aggregate DESI score grew slightly more than expected by the convergence curve, meaning it improved at a marginally higher pace than the score of the Union as a whole. Malta's various efforts are reflected in its good performance across the different dimensions of the 2022 DESI.

The large majority (73%) of Maltese small and medium-sized enterprises (SMEs) have at least a basic level of digital intensity and Maltese enterprises perform very well in the use of cloud solutions and big data.

There has been a remarkable improvement in the uptake of e-government services, with the share of users reaching 72% in 2021 and surpassing the EU average. Malta continues to be a leader in the offer of digital public services to its people and enterprises, but access to and use of open data remains weak. (DESI Malta 2022).

Figure 10.3 DESI- relative performance according to dimensions



Source: DESI Malta 2022

In the Human capital dimension, Malta ranks 7th out of 27 EU countries. Malta performs above EU average on digital skills: 61% of people have at least basic digital skills, including 35% who boast above basic skill levels across all dimensions. The eSkills Malta Foundation, in collaboration with other stakeholders and training providers, implemented several measures in 2021, including an annual digital skills bootcamp and initiatives for upskilling in advanced technologies (e.g., Industry 4.0, blockchain, AI). The foundation also organised training courses and events to promote women in digital. To further advance digital inclusion, Malta participates in the multi-stakeholder partnerships Women4IT and ICT 4 the Elderly.

Digital Malta 2014-2020[208] strategy outlined three strategic themes - Digital Citizen, Digital Business and Digital Government, and these have been supported by three strategic enablers: Regulation and Legislation, Infrastructure and Human Capital. The strategy aims at enhancing digital literacy and social equality, increasing access for all, with specific focus on vulnerable groups, elderly and women. Such efforts will continue through a new overarching policy for digital investments in Malta, which is the *Digital Strategy 2022-2027*.

In respect of digitalisation in agriculture, Malta has been participating in HORIZON 2020 project SmartAgriHubs[209]. It employs a multi-stakeholder approach and covers a broad value-chain network across all EU member states. Malta participates in the Regional Cluster Italy-Malta "Boosting the digitisation of the Italian and Maltese agri-food sector". The Regional Cluster focus lies in

[208] Digital Malta 2014-2020 https://digitalmalta.org.mt/en/Documents/Digita20Malt2020120-202020.pdf
[209] https://www.smartagrihubs.eu/about

"*supporting and fostering the digital transformation of the agri-food sector, connecting all the individual players of the national and regional innovation ecosystem. To serve this goal, it promotes the creation of new Digital Innovation Hubs (DIHs) by leveraging already existing initiatives fostering the participation of farmer communities to these innovation ecosystems."*[210]

The drive towards digitalisation is also being supported through Agriculture Research and Innovation Hub, which serves as the centre for research on innovative digital farming and sustainable farming management practices. Several projects have been implemented, focusing on:

- AI Traps: The installation of AI, IOT probes to monitor the pest populations that influence the five major crops grown locally;
- Pest prediction models: Using a variety of meteorological data inputs and expertise on pest population dynamics, pest prediction models are being developed to predict pest infestations thus safeguarding crop yields through precision farming.
- Research on the application of drone technologies in agriculture, aiming towards precision agriculture
- Siti for Farmer: The establishment of a holistic online platform for farmers to access data and information related to agriculture respective to their own parcels.
- Weather stations: Work is ongoing towards establishing a national network of weather stations that collect accurate meteorological data.

Strengths

The small size of the Maltese islands and the proximity of urban and rural areas logistically allows forfarmers to attend training sessions and receive advice, without having to leave holdings unattended for extended periods of time.

The small size of the agricultural community, in principle, should also be advantageous since information can be better disseminated among farmers. The high broadband coverage and level of digitalisation is a significant advantage and strength.

Some standards of knowledge are already in place, for example, all distributors and professional users of pesticides in Malta are required to undertake training, and use is restricted in sensitive sites. Similarly, training concerning the use of organic and inorganic fertilizer is also available. Establishment of bodies like AgriHub and AgriConnect aims to offer farmers a wider range of technical advice, while effectively combining research and development with up-to date advisory and extension services. Participation in Horizon2020 programme is also a positive step and can provide the local sector with valuable knowledge and best practices implemented in other Member States.

The share of farm managers below 35 years of age with at least a basic level of agricultural training inMalta (at 54% in 2016) is above the EU average for this age bracket. This share is also much higher than the total share of farm managers with at least a basic agricultural training in Malta (31%). These data show how the younger generation of Maltese farmers have a higher level of knowledge than their

[210] Smart AgriHubs, Italy & Malta Regional Cluster, https://www.smartagrihubs.eu/regional-cluster/italy-and-malta

older compatriots.

The farming community in Malta is small and although there is competition between farmers, there is also significant collaboration and social learning among farmers.

The establishment of AgriConnect as a one-stop shop for farmers in respect of advice is expected to significantly help farmers with CAP related requirments, including conditionality, area based payments, rural development measures, maintaining the herdbook, carrying out soil tests, and the setting up and updating of soil manangement plans, crop plans and nutrient management plans, amongst others.

The setting up of the Agricultural Research and Innovation Hub (AGRIHUB) aims to support innovative agriculture, apply research and implement pilot projects using the latest technology, with the aim of supporting local farmers. The aim is therfore to carry out projects and collect data and information that can then be disseminated amongst the farming community, to support its modernisation and ensure its renewal.

In view of the proximity of rural and urban areas in Malta, and the availability of similar services including education and high speed broadband across all of the island, adequate literacy skills can be noted also in rural areas.

Given that high speed broadband is available in both urban and rural areas, there is no evident digital divide and those operating in rural areas have access to the same services as other businesses operating in urban areas.

Participation in Smart AgriHubs and Horizon2020 programme, aims at boosting the digitisation of the agricultural sector, fostering the digital transformation of the sector through the participation of farming communities.

Weaknesses

For semi-subsistence farmers whose household incomes depend upon a variety of sources, the time and effort that they can devote to agricultural production is limited by their need to spend time earning income from other activities. This means that the sector suffers from a lower level of knowledge exchange and research and development.

Many farmers in Malta have insufficient knowledge of the potential benefits of co-operation, with farmers perceiving other farmers and farmer groups as competitors, or wishing to have sole control of their individual production and investment decisions, for historical and/or cultural reasons.

The farms present a low R&D absorption capacity (EC, 2019) which is mainly due to low degree of interaction between the producers and research/university bodies.

There is limited research and knowledge exchange on the topic of how best Maltese producers can switch to more climate-friendly production methods, including reduced reliance on chemical fertilisers and pesticides, water-saving practices, and alternatives to the use of fossil fuels (e.g. for groundwater abstraction, transport of goods to market, cooling).

In Malta farmers lack the tools or the context to analyse their own soils data and are mostly unaware of the extent to which their data could be stored, traded and analysed for future use.
Small, elderly or less educated farmers lack sufficient digital knowledge and access to data to develop

adapted solutions for small farms. They lack sufficient incentives for innovation, to better tailor precision agriculture technologies to their needs.

Young farmers face limited opportunities for continuous professional development related to both technical matters and business development skills and knowledge.

Experience of CAP funding to date suggests that demand for new knowledge and innovation among Malta's farmers is limited by their individual circumstances and the lack of collective or strategic institutions or organisations that could take such initiatives forward. The AKIS system in Malta is characterised by a small number of actors with a low level of coordination and a lack of systemic vision. Farm advisory services are provided by few private, mostly farmers'-based organizations and AgriConnect (public body).

Opportunities

There is an important opportunity to adopt a strategic and holistic approach to expand and strengthen the AKIS inMalta, to ensure that all farmers can access appropriate training and advice on sustainable practices and understand its long-term benefits for maintaining the sector.

Investing in training and support to young farmers in the sectors with potential to grow market share offers a clear opportunity to benefit incomes and sector viability in the longer-term.

There are opportunities to increase the knowledge base of local food producers in nutrition to better address the needs of the market, including through collaboration between the agriculture and health sectors.

The National Agricultural Policy identifies a number of sectors that could benefit from research and innovation, including rural tourism and the preservation of the rural environment; identification of new plant varieties and livestock to better withstand the climate; and novel or niche sectors that may hold potential for exports and/or processing including snail farming, insect farming, aquaponics; and the production of bio-control agents for use in Integrated Pest Management.

Looking ahead, new ways are needed to encourage collaborative working and social learning among farmers, which go beyond the provisions of existing measures and delivery approaches. A slow and steady building of confidence and social capital is warranted, which might best be fostered initially using measures such as training and advice.

Training and advice will play an essential role, not just in raising awareness about risks faced by climate change, but also potential strategies and technologies for decreasing risk and adapting. Training will

also be required in partnership working and collaborative actions, as well as working with existing co-operatives across the farm sector to encourage them to develop more climate-proof strategies.

There is a scope for innovative approaches and digitalisation in areas such as organic production, improved pesticide management, smart and precision farming, smart irrigation techniques, innovative technological processes and the electronic prescription system to support livestock farmers. Implementation of SmartAgriHubs outcomes present an opportunity to facilitate the adoption of cutting-edge innovations, and foster farmers' participation and strengthens their connection with these innovations.

There is an important opportunity to continue raising farmers' awareness and capacity to act effectively to reduce water use and minimise water pollution by nutrients, wastes and pesticides in order to protect this important resource that is already under threat.

There is still scope to further encourage collaborative working, cooperation and social learning among farmers, to improve digitalisation and the use of modern technologies within the sector.

Creating an informal educational system to pass on the knowledge in respect of traditional trades, customs and culture is an important opportunity, to ensure that practical knowledge that is in line with Malta's specific geophysical and climatic conditions is not lost as older generations retire.

Threats

Poor knowledge and understanding of the scope and significance of climate-mitigating measures and strategies in Maltese agriculture threatens the viability and extension of climate proofing in this sector.

Limited knowledge among farmers concerning the scope and importance of terrestrial Natura 2000 sites may threaten the adequate management of such areas.

The acquired cultural and practical knowledge gained through experience of longstanding generations of farmers may be lost if not transferred to an emerging generation of farmers.

Implications for needs and the case for intervention

The SWOT analysis identifies significant cross-cutting issues that need to be targeted for the agricultural sector to be able to renew itself and further develop the production of high quality, sustainably produced food. The lack of relevant expertise among farmers and others in the food sector, leads to limited traceability and lengthy food supply chains that do not benefit the primary producer. Given that knowledge regarding marketing, quality assurance and branding are very limited, capacity building needs to take place to improve knowledge concerning better food quality, safety and traceability that is in line with consumer demand and produced sustainably, while also ensuring the

viability of the holding.

On the other hand, limited environmental knowledge and recognition of its importance for sustaining agriculture in the longer term is a key challenge for Malta's farming population. Better farmer knowledge concerning climate change adaptation and mitigation; sustainable energy production; effective management of water, soil and air; and the protection of biodiversity, ecosystems and habitats are important to ensure environmental sustainability and reduce the impact of farming on the environment.

Improved technical agronomic and agri-business skills among Maltese farmers could enable the sector to be more productive and more profitable. There is also a need to update farmers on hygiene, health and welfare issues for all types of livestock; improved nutrition for rabbit, poultry, pig, bovine, ovine and caprine sectors; business development for producers, with the aim of improving market orientation of the sector; principles of quality schemes that add value to agricultural produce, their operation and advantages; production planning, better marketing and promotion of a wide range of products; realistic options and techniques for adding value to primary produce; strategies for enhanced marketing and promotion taking into account where appropriate environmental and climate credentials of the produce to valorise and capitalise further as a means of improved sales; assuring quality through traceability and record keeping.

Young farmers, the future of the agricultural sector, need to be equipped with the necessary knowledge that ensures profitable and environmentally sustainable farming. Young farmers, whether coming from a farming family or from an unrelated sector, require specific intensive training to deal with the many challenges faced by Malta's agricultural sector, in order to ensure its future sustainability.

The Needs are therefore very broad and central to the whole CAP strategy, as follows:

XCO.1 Developing a holistic and strategic approach to grow and enhance the AKIS in Malta

XCO.2 Ensuring that other SO's integrate knowledge exchange, advice, training and information provision