



THE STATE OF **MALTA'S**
BIODIVERSITY FOR FOOD AND
AGRICULTURE

This country report has been prepared by the national authorities as a contribution to the FAO publication, *The State of the World's Biodiversity for Food and Agriculture*. The report is being made available by the Food and Agriculture Organization of the United Nations (FAO) as requested by the Commission on Genetic Resources for Food and Agriculture. The information in this report has not been verified by FAO, and the content of this document is entirely the responsibility of the authors, and does not necessarily represent the views of FAO, or its Members. The designations employed and the presentation of material do not imply the expression of any opinion whatsoever on the part of FAO concerning legal or development status of any country, territory, city or area or of its authorities or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed by FAO in preference to others of a similar nature that are not mentioned.

Malta - Brief country report contributing to The State of the World's Biodiversity for Food and Agriculture

I. Assessment and monitoring of biodiversity for food and agriculture

1.1 General context

a) Provide a brief account on the role of biodiversity for food and agriculture in your country.

Biodiversity provides key benefits to the Maltese community, including scenic, recreational, scientific, educational, cultural and socio-economic benefits. The use of local animal resources also provides the country with a degree of self-sufficiency and reduces our reliance on the importation of foreign produce and resources. It also minimizes the risk of the introduction of animal diseases which could severely impact Maltese animal population, not to mention other environmental and socio-economic impacts that these could cause.

Malta imports and introduces within its territory a wide variety of fruits and vegetables from third countries and EU Member States. Some plant diseases present in other countries may pose a threat to local production, especially since some diseases are latent and show no symptoms on import/introduction, and most are able to establish in Malta. Plants, plants for planting and propagation material of various plant species mainly of cereals, fodder plants, vegetables, fruit trees, vines and ornamentals, are also imported / introduced, thereby posing a high risk of introduction of plant pathogens.

b) Indicate which of the production systems listed in Table 1 below are found in your country and briefly describe each of them (e.g. area under production, share of smallholders, importance of the production system to the incomes, livelihoods and well-being of rural communities, etc.).

Table 1. Production systems present in the country.

| Production system | Indicate if present in the country (Y/N) | Description |
|-----------------------------------|--|---|
| Livestock grassland-based systems | N | N/A |
| Livestock landless systems | Y | Livestock is kept in enclosures since pastures are not available. |
| Naturally regenerated forests | N | All forested areas are protected and there is no production of wood or non-wood forest products. |
| Planted forests | N | All areas are protected and there is no production of wood or non-wood forest products. |
| Self-recruiting capture fisheries | Y | The Maltese capture fisheries are well developed and involve major fisheries for pelagic species such as Mediterranean swordfish, Atlantic bluefin tuna, Mediterranean dolphinfish. Trawling fisheries targeting benthic species are also of importance. A part of capture fisheries are of artisanal nature, involving small-scale fishing vessels. Traditional fishing methods involving seine nets are also practiced. |
| Culture-based fisheries | N | N/A |
| Fed aquaculture | Y | Aquaculture in Malta is marine-based. It consists of the capture based aquaculture of the Atlantic bluefin tuna (<i>Thunnus thynnus thynnus</i>), as well as the culture of European sea bass (<i>Dicentrarchus labrax</i>) and Gilthead sea bream (<i>Sparus aurata</i>) with a small |

| | | |
|---|-----|--|
| | | <p>production of Meagre (<i>Argyrosomus regius</i>) and amberjack (<i>Seriola dumerili</i>). Atlantic bluefin tuna is exported mainly to Japan, whereas European seabass and Gilthead seabream are exported to Europe, mainly Italy. Aquaculture of seabass, seabream and meagre takes place in floating cages, approximately one kilometer offshore. In the case of Bluefin tuna, an Aquaculture Zone 6 km off the southeastern coast is utilized by farms to fatten up the captured bluefin tuna. Another Aquaculture Zone towards the north of Malta is being planned. In total, 5 farms operate at 9 sites, one farm producing only closed cycle species (CCS), one both CCS and tuna, and the others only tuna.</p> <p>The production process for tuna consists of the capture of wild adult fish (typically over 70kg) in May/June mainly in the southern Mediterranean, transfer back to pens in Malta, with a fattening period of 6 months or more. The fish are fed on thawed wet baitfish which is imported frozen and put on about 30% bodyweight before harvest mostly in the autumn. Blue-fin tuna production was around 6,000 tons in 2013 and 5,500 tons in 2014.</p> <p>The farming of “closed cycle species” (CCS) such as sea bream, sea bass and meagre are cultured from eggs produced in hatcheries and fed on manufactured dry feed. A very limited amount of amberjacks are produced through a joint venture project between the government and a private company. CCS production was around 3,000 tons in 2013, which increased to 3,150 tons in 2014.</p> |
| Non-fed aquaculture | N | N/A |
| Irrigated crops (rice) | N | N/A |
| Irrigated crops (other) | Y | In view of the heretic rain patterns, farmers nowadays have to rely more on irrigation if they want to earn a decent living. Crops such as potatoes, quality intended grape vines, tomatoes, most fruit and vegetables depend on irrigation water. |
| Rainfed crops | Y | All fodder produced +/- 5000Ha and a number of crops such as onions and legumes are rainfed crops. |
| Mixed systems (livestock, crop, forest and/or aquatic and fisheries) | N | N/A |
| Others (please specify) | N/A | N/A |

1.2. State, trends and drivers of change of biodiversity for food and agriculture

a) Describe the main features of the state and trends of and the main drivers of change affecting plant, animal, forest and aquatic genetic resources in the country's production systems as identified in Table 1.

In general terms, pollution, over-exploitation, climate change, pests, diseases and alien invasive species, trade, markets and private sector influence, as well as policies, and socio-cultural pressures all influence genetic resources in Malta's production systems to varying degrees.

Livestock production:

The animal production in the country is based on intensive animal farming system with small-medium size herds. Due to the limitation of land available and the limitation connected to nitrites contamination, grazing is not allowed in the country.

Due to the importation of much raw feed material, the higher cost of the production is leading the primary sector to concentrate the animals in larger farms and reducing the number of small holders. Importation of cattle and small ruminants is very limited at present in comparison to past years when the practice was connected to the animal health eradication programmes and the replacement of slaughtered animals. Importation of animals is limited to EU countries not affected by major animal diseases.

The bovine and swine sector are represented by cooperatives of farmers that are in charge for the improvement of genetic selection of animals in the farms and the connected monitoring of the productions. Climate change is contributing to the research of more handy varieties and livestock that can withstand better adverse climatic conditions.

Fisheries and aquaculture:

Fisheries and aquaculture production systems are strongly market driven. Local fish consumption varies throughout the year. European seabass and Gilthead seabream production was 2,364 tonnes whilst the Atlantic bluefin tuna production was 8,051 tonnes. Consumption trends depend on the availability of fresh substitutes which are imported at cheap prices, or locally caught fish at favourable low prices, for example dolphinfish (*Coryphaena hippurus*), Bluefin tuna (*Thunnus thynnus*) or swordfish (*Xiphias gladius*). Consumer demand and the quality of the fresh products are considered to be market drivers in both aquaculture and capture fisheries. With regard to exports, European seabass and gilthead seabream are exported whole mainly to central and north Italy, the main buyers being large supermarkets or hypermarket chains, as well as large wholesalers. Cooperatives exist also for the small ruminant sector and for rabbit production. The former is involved currently in drafting specifications for obtaining Protected Designation of Origin (PDO) status for the production of Ġbejina.

In the case of Atlantic bluefin tuna, the slaughtered fish are exported fresh or frozen to Asian markets, mainly Japan. Fish farming has a positive effect on the employment of unskilled and skilled labour, and is a strong economic driver. During the last decade, there has been a definite shift of cultured species from European seabass and gilthead seabream to Atlantic bluefin tuna. The Ministry for Sustainable Development, Environment and Climate Change encourages research into species diversification through the Malta Aquaculture Research Centre (MAR) and hopes to develop breeding and rearing techniques of the greater amberjack and Atlantic bluefin tuna among other innovations in aquaculture.

Aquaculture pollution causes nutrient enrichment in the water column, reportedly having a positive effect on the species richness and abundance of molluscs, decapods and echinoderms associated with *Posidonia oceanica* meadows in the vicinity of aquaculture sites.

Social and cultural factors are also important drivers of change in marine biodiversity; albeit no specific data are available to date, such factors are expected to lead to changed in production practices in the future. Various issues have arisen due to the conflict between tourism and aquaculture operations due to the severe lack of space around the Maltese islands. An Aquaculture Strategy has identified the way forward for this sector for a sustainable aquaculture industry, through better management practice and a shift to the rearing of more closed cycle species. The aquaculture strategy also emphasizes the need for the identification of environmental carrying capacities for each individual site. Such pressures are also triggering further studies to

better understand the mechanics and drivers of change involved, with the aim of achieving sustainability targets.

Crop production:

In Malta, potatoes are by far the major agricultural crop, followed by tomatoes, onions and melons, including watermelons. The cultivation of fruit is dominated by grapes for wine production, followed by peaches and other related stone fruits. On the other hand, wheat is abundantly cultivated, mainly as a fodder crop. A number of crop wild relatives and local varieties exist, and comprise tomatoes, gourd vegetables, cruciferous vegetables, onions, pulses, and fodder plants, among others. For instance, the two recognised varieties of local tomato are a flat type ("tadam ċatt") and an elongated type ("tadam ženguli"). The flat tomatoes are suited for and traditionally used to make sun-dried tomatoes. Two varieties of sulla (*Hedysarum coronarium*) exist in Malta which are useful to farmers for their hardy nature. One drought-resistant, tall-stemmed variety of sulla can be found in small, isolated areas. Another wild variety called "tan-nebbieta" is ideal for grazing by sheep and goats, and is mainly found on clay slopes in the north and north-west of Malta. Other legume fodder plants are the Bitter vetch (*Vicia ervilia*) called "Žożfa", the Chickling vetch (*Lathyrus sativus*) called "Ċikkarda", and the Caterpillar plant (*Scorpiurus muricatus*) called "Widna". However, the main cereal fodder crop is a short-stemmed variety of wheat (*Triticum sp.*), which used to be mainly grown on dry land.

Plant pests and diseases comprise an important driver of change, which over the past 10 years have negatively impacted plant genetic resources in the Maltese production systems. Amongst the most important, *Citrus tristeza* virus has threatened local citrus varieties that were originally grafted on sour orange making them more susceptible to the disease. Incidence of the wood borer *Phrynetta leprosa* has also been recorded, damaging mulberry trees and wiping out approximately 90% of the local trees, most of which were quite old. Other pathogens of importance to food crop production systems include: the tomato leaf miner moth, *Tuta absoluta*, which has drastically affected local tomato production; and, *Hypocryphalus scabricollis*, which has decimated indigenous varieties of *Ficus carica* trees.

Also, one can note a trend on the use by local farmers of commercial varieties that have a higher yield and more disease resistance.

b) Indicate whether the country has any national information system in place on associated biodiversity and identify the most frequently monitored components of associated biodiversity.

Malta has no formal centralized information system which manages information pertinent to associated biodiversity. However, a number of assessments and data collection have to date been carried out, namely:

- On grasslands, birds and other species of relevance, in relation to the EU Nature Directives¹, Article 12² and 17³
- On soil biodiversity⁴, and
- On fungi⁵.

c) List associated biodiversity species that are actively managed in production systems for the provision of ecosystem services in Table 2.

¹ http://ec.europa.eu/environment/eir/pdf/report_mt_en.pdf

² <https://circabc.europa.eu/faces/jsp/extension/wai/navigation/container.jsp>

³ <http://cdr.eionet.europa.eu/mt/eu/art17/envue53pa>

⁴ SOER 2005 SOIL CHAPTER: SHORT NOTE ON SOIL BIODIVERSITY:
[https://era.org.mt/en/Documents/Short note on soil biodiversity%202005.pdf](https://era.org.mt/en/Documents/Short%20note%20on%20soil%20biodiversity%202005.pdf)

⁵ BERN Fungi report:

<https://wcd.coe.int/com.instranet.InstraServlet?command=com.instranet.CmdBlobGet&InstranetImage=2052250&SecM ode=1&DocId=1812132&Usage=2>

Malta has carried out a preliminary identification of key ecosystems and ecosystem services for Malta as part of Malta's Fifth National Report to the Convention on Biological Diversity. On the basis of this exercise, work has commenced to implement the measures relating to MAES (Mapping and Assessment of Ecosystems and their Services) in Malta's National Biodiversity Strategy and Action Plan (National Biodiversity and Action Plan-NBSAP) 2012-2020. This work involves prioritizing ecosystems and ecosystem services for mapping and assessment, determining the level of detail best applicable for Malta, identifying available data/data sources that can be used in this regard and data gaps that will need to be addressed, as well as stakeholders/experts to be consulted in the process, in particular for selection of the indicators to be used. In relation to Food and Agriculture, a number of provisioning ecosystem services will be considered for inclusion, such as 'Cultivated crops', 'Reared animals and their outputs', 'Animals from in-situ aquaculture' and 'Materials from plants, algae and animals for agricultural use' (as per CICES classification*). Various species are actively managed in production systems for the provision of these ecosystem services, such as the Maltese Honey Bee (*Apis mellifera subsp. ruttneri*) for the production of honey, Sulla (*Hedysarum coronarium*) and wheat (*Triticum sp.*) grown as fodder, olives harvested for olive oil production (from olive trees *Olea europaea subsp. sativa*), and fish farmed in the aquaculture industry, such as sea bream, sea bass and meagre.

Furthermore, sustainable production and consumption as well as considerations of biodiversity issues are increasingly being integrated in sectoral policies that benefit from ecosystem services such as the provision of food and other natural resources including supporting services such as relevant to the fisheries and agriculture sectors.

Table 2. List of associated biodiversity species that are actively managed in production systems for the provision of ecosystem services.

| Associated biodiversity species | Ecosystem functions and services provided by the species in the production system |
|--|---|
| <i>A list of associated biodiversity species that are actively managed in production systems for the provision of ecosystem services is not available.</i> | N/A |

d) Provide in Table 3 a list of wild food species known to be harvested, hunted, captured or gathered for food in your country. Indicate the change in state of the species over the last 10 years (strongly increasing (2), increasing (1), stable (0), decreasing (-1), or strongly decreasing (-2), or not known (NK)).

Table 3. Wild food species used for food in the country.

| Wild food species | Change in state (2,1,0,-1,-2, NK) |
|--|-----------------------------------|
| <i>Alliums pp.</i> | 0 |
| <i>Anethum graveolens</i> | 0 |
| <i>Apium graveolens</i> | -1 |
| <i>Arbutus unedo</i> | 0 |
| <i>Asparagus stipularis / aphyllus</i> | 0 |
| <i>Austropotamobius pallipes</i> | NK |
| <i>Borago officinalis</i> | 1 |
| <i>Capparis orientalis/spinosa</i> | 0 |
| <i>Ceratonia siliqua</i> | -1 |
| <i>Crataegus azarolus</i> | -1 |
| <i>Crataegus monogyna</i> | NK |

| | |
|---------------------------------------|----|
| <i>Crataegus x grignonensis</i> | NK |
| <i>Crithmum maritimum</i> | 0 |
| <i>Cydonia oblonga</i> | -1 |
| <i>Darniella melitensis</i> | 0 |
| <i>Diploaxis spp</i> | 1 |
| <i>Eruca sativa</i> | -1 |
| <i>Ficus carica</i> | 1 |
| <i>Foeniculum vulgare</i> | 2 |
| <i>Laurus nobilis</i> | 1 |
| <i>Limbarda crithmoides</i> | 0 |
| <i>Malus domestica/ sylvestris</i> | 0 |
| <i>Melissa officinalis</i> | -1 |
| <i>Mentha pulegium/ spicata</i> | 0 |
| <i>Mespilus germanica [EX]</i> | 0 |
| <i>Morus alba</i> | -1 |
| <i>Morus nigra</i> | -1 |
| <i>Olea europaea</i> | 2 |
| <i>Oryctolagus cuniculus</i> | NK |
| <i>Pleurotus eryngii var. ferulae</i> | 0 |
| <i>Prunus domestica</i> | NK |
| <i>Prunus dulcis</i> | -1 |
| <i>Prunus mahaleb</i> | -1 |
| <i>Prunus persica s.l. (nat.)</i> | NK |
| <i>Prunus Spinosa [EX]</i> | -1 |
| <i>Punica granatum</i> | NK |
| <i>Pyrus pyraister [RR]</i> | -1 |
| <i>Ridolfia segetum</i> | 0 |
| <i>Rosmarinus officinalis</i> | 0 |
| <i>Rubus ulmifolius</i> | 1 |
| <i>Salvia fruticosa/ officinalis</i> | -1 |
| <i>Sorbus domestica [EX]</i> | -1 |
| <i>Thymus capitatus</i> | 0 |
| <i>Tropaeolum majus</i> | 1 |
| <i>Ziziphus zizyphus [RR]</i> | -1 |
| <i>Pandalus spp</i> | NK |
| <i>Scomber japonicas</i> | NK |
| <i>Xiphias gladius</i> | -2 |
| <i>Coryphaena hippurus</i> | NK |
| <i>Alosa Alosa</i> | NK |
| <i>Mullus spp</i> | NK |
| <i>Pagrus pagrus</i> | NK |
| <i>Thunnus thynnus</i> | 1 |
| <i>Boops boops</i> | NK |
| <i>Lepidopus caudatus</i> | NK |

e) If available, provide information on the proportion of the population in your country that uses wild food on a regular basis for food and nutrition.

Dependence on wild land animals or plants for food and nutrition does not generally exist in Malta. Wild food plants in Malta generally comprise fruit trees and herbaceous plants, and may include naturally occurring wild capers and prickly pears, as well as some spices and herbs. Capture fisheries rely on wild marine sources, including bluefin tuna aquaculture which is capture based.

f) Briefly summarize the state and trends of and the drivers of change affecting:

- Associated biodiversity: micro-organisms, invertebrates, vertebrates, plants
- Ecosystem services: regulating, supporting
- Wild food resources

As detailed in the Fifth National Report on the Implementation of the Convention on Biological Diversity⁶ (5NR-CBD) dated 2014, biodiversity in Malta is important for provisioning, regulating, supporting and cultural services. These may be altered as a result of human action as well as changes in environmental conditions. Direct drivers of biodiversity loss bring about changes in ecosystem services (such as soil erosion and loss of fertility, loss of aesthetic value and scenery in the countryside, pollution, climate change-related risks and hazards, just to mention a few). Such changes have socio-economic and cultural implications such as on health, on tourism, on outdoor recreation and on agriculture productivity.

The main direct drivers of change to biodiversity in general remain as reported in Malta's 4NR-CBD i.e. land conversion/degradation, pollution and invasive alien species. Indirect drivers of change in Malta include constraints in resources hindering effective or timely conservation action, misconceptions towards elements of biodiversity and lack of biodiversity valuation in decision and policy making.

Part of the conservation status assessments undertaken as a requirement of the EC Habitats Directive relates to the pressures and threats being faced by those habitats and species listed in the Directive and found in Malta. Impacts are categorized in two groups: (a) pressures, i.e. factors acting now or that have been acting in the past few years; and (b) threats, i.e. factors expected to be acting in the future. Noting this, it is possible for the same impact to be both a pressure and a threat if it is having an impact now and the impact in question is likely to continue in the coming years. This pressure and threat assessment was carried out by Malta in 2007 and in 2013, with some slight adjustments on the method between one reporting period and the other as required by the Habitats Directive Article 17 Reporting guidelines. A standard extensive list of pressures/threats is to be followed, with these being assigned to the main categories given in the 5NR-CBD⁷. Information on the level of the pressure/threat, indicating whether it is of high, medium or low importance/impact was also collected and evaluated⁸. The intention of the reports prepared for each habitat and species was to include a maximum of five high importance pressures, and up to a maximum of twenty pressures in all (same goes for threats).

The identified main categories for pressures and threats comprise:

- Agriculture;
- Transportation and service corridors;
- Sylviculture, forestry;
- Mining, extraction of materials and energy production;
- Urbanisation, residential and commercial development;
- Biological resource use other than agriculture & forestry;
- Human intrusions and disturbances;

⁶ <https://www.cbd.int/doc/world/mt/mt-nr-05-en.pdf>, Sub-section 1.2.1

⁷ Idem., Sub-section 1.5.1, Table 23

⁸ Idem., Sub-section 1.5.1, Table 24

- Pollution;
- Invasive, other problematic species and genes;
- Natural system modifications;
- Natural biotic and abiotic processes (without catastrophes);
- Geological events, natural catastrophes;
- Climate change.

BOX 1. Describe one or two examples of countermeasures that have been taken in the country to reduce adverse effects of drivers on associated biodiversity, ecosystem services and/or wild foods.

Various projects have also been undertaken over the years to reintroduce and reestablish important indigenous tree species such as the olive. A large number of Protection Areas (TPAs) have been announced by the Environment and Resources Authority (ERA) as part of its efforts to protect important sites that harbour rare and endangered trees. In the beginning of 2017, these areas amount to approximately 60; some of the areas protect individual trees or groups of trees, such as old olive trees, the dwarf fan palm and the mock privet. Trees within these areas are protected from activities that may have an adverse impact on them, such as development.

In connection with such conservation efforts, Malta plans to establish a national gene bank which will host important crops, wild food species, and crop wild relatives for the preservation and sharing of national plant genetic resources for food and agriculture.

1.3 Needs and priorities

a) Identify the country's main needs and priorities in terms of the state of biodiversity for food and agriculture, and in particular of associated biodiversity, wild foods and ecosystem services.

In general terms, a number of needs and priorities may be identified, with particular reference to the recommendations set forward by the ITPGRFA, and include:

- A need to characterize and evaluate biodiversity for food and agriculture at national level to better understand the size and value of such biodiversity, in order to enable targeted conservation efforts. Research, education, capacity building and international cooperation are of essence for achieving this task. Sharing of expertise is particularly important in developing indicators to allow for the monitoring of the status and trends of genetic resources for food and agriculture as they change over time. Such indicators may be needed to be developed at a national level.
- Facilities for ex-situ conservation and sharing of genetic resources for food and agriculture are also absent particularly for plant genetic resources; the development of a genebank at national level is considered a need in the light of climate change and the ever increasing phenomenon of globalization resulting in decreased use of traditional crop varieties; with the development of such a facility, capacity development will be an important priority due to the technical nature of the tasks required for managing germplasm banks.
- There may also be a need to ascertain whether crop breeding and fortification may be required to improve varieties available at national level and improve the contribution of the local market to the global one.

In concrete terms, the main needs and priorities in relation to the state of biodiversity for food and agriculture are identified in Malta's National Biodiversity Strategy and Action Plan (NBSAP) 2012-2020⁹ as follows:

⁹ <https://www.cbd.int/doc/world/mt/mt-nbsap-01-en.pdf>

- Measure GR1: Distinct plant and animal genetic resources for food and agriculture (i.e. local livestock breeds and crop varieties, as well as wild relatives / landraces) are conserved as a genetic insurance in the face of environmental and climate risks as well as for food security. This is mainly achieved via the uptake of appropriate Agri-Environmental Measures to support genetic diversity in agriculture.
- Measure SH1: The integrity, structure and functioning of important ecosystems is maintained and, where required, restored, thereby securing the continued flow of ecosystem goods and services. This is done by mapping and assessing the state of ecosystems and their services in the Maltese territory.
- Measure BE3: The economic valuation of ecosystem services is assessed and integrated into green and reporting systems at a national level by 2020.
- National Target 2: By 2020, the values of biodiversity and ecosystem services, and the opportunities derived from their conservation and sustainable use, are recognized and integrated in national policies (including national accounting, as appropriate), as well as decision-making and planning processes.
- National Target 4: By 2020, main sectors that are beneficiaries of ecosystem services have incorporated biodiversity concerns into their sectoral and cross-sectoral plans, policies and programmes, as appropriate.
- National Target 7: By 2020, areas under agriculture and aquaculture are managed sustainably, ensuring the conservation of biodiversity.
- National Target 13: By 2020, the status of crop and livestock genetic diversity in agricultural ecosystems and of wild relatives has been safeguarded and improved, where feasible.

Fisheries:

Malta's priorities in relation to aquaculture production systems are defined in the "Strategic Environmental Assessment On Malta's Aquaculture Strategy,"¹⁰ as well as the more recent "Aquaculture Strategy For The Maltese Islands: Towards Sustainability 2014-2025."¹¹ The strategy aims towards improving aquaculture farm operations and encouraging those activities which adhere to the principles of best practice and comply with the conditions of their operating consents, and work within the limits of the environmental carrying capacity of the coastal zone and marine areas. Through the strategy the aquaculture sector is oriented towards maintaining Good Environmental Status and Good Ecological Status of coastal and marine waters. In this context, national priorities include:

- the development of an Industry Code of Good Practice;
- streamlining the existing environment monitoring system and ensuring that it recognises the link between biomass and impacts;
- strengthening the monitoring and enforcement regime for permits and licences;
- introducing the concept of fallowing particularly for sheltered areas;
- improving the regulation of relevant farm operations including the disposal of tuna offal.

In general, priorities for fisheries and aquaculture include the conservation of marine biological resources and the management of fisheries and fleets exploiting such resources; this includes the management of the relation to market and financial measures in support of the implementation of the EU's Common Fisheries Policy including aquaculture, and the processing and marketing of fisheries and aquaculture products.

Monitoring of the inputs in marine ecosystems is an important priority. Video monitoring or monitoring of the sea-grass *Posidonia oceanica* parameters, are carried out in areas which are identified as being particularly sensitive. The objective of such monitoring activities is to minimize adverse ecological changes and related

¹⁰ Strategic Environmental Assessment On Malta's Aquaculture Strategy:

<https://agriculture.gov.mt/en/fisheries/Documents/Final%20Environmental%20report%20%20Aquaculture%20Strategy%20Oct%202013%20post%20public%20c.pdf>

¹¹ Aquaculture Strategy For The Maltese Islands: Towards Sustainability 2014-2025:

<https://agriculture.gov.mt/en/fisheries/Documents/Aquaculture%20Strategy%20for%20Maltese%20Islands%20July%20014.pdf>

economic consequences resulting from water use, land use, discharge of effluents, use of drugs and chemicals and other related activities. The inputs of chemicals hazardous to human health and the environment are regulated and need to be registered and monitored during each operation. Safe, effective and minimal use of therapeutics, hormones, drugs, antibiotics and other disease control chemicals should be ensured. These programmes have to be approved by the Environment, Fisheries Aquaculture and Veterinary Authorities, according to the remits of the relative agencies. Aquaculture developments must comply with all local, regional and global management systems aimed at the conservation of species.

Agriculture:

The rural development programme for Malta 2014-2020 establishes Agri-Environment-Climate Measures (AECM) which fund and prioritize particular areas for agricultural growth. These measures place specific emphasis on certain biodiversity in production systems and are outlined below:

- AECM 1 - Measure to control weeds in orchards and vineyards by mechanical, instead of chemical, methods: The use of mechanical cutting of the weeds may allow certain weeds to flower and eventually seed. This will not be possible with the use of herbicide as the product will kill the weeds.
- AECM 2 – Support for the maintenance of recommended tree species replacing Alien Species or planted on slopes and terraces to prevent soil and wind erosion: This measure supports the planting of trees, aiming to provide supporting services and increase biodiversity. Also, the trees shall provide shelter of other bird/animals/reptiles
- AECM 3 – Measure supporting the introduction of bee boxes on holdings: This measure is targeted towards pollinators; bees help with the pollination of flowers. Therefore, the encouragement to increase bee boxes shall help to increase pollination of both agricultural crops and wild plants
- AECM 4 – Measure for the implementation of an Integrated Pest Management Plan targeting Vineyards and Orchards: Integrated Pest Management (IPM) shall help to reduce plant protection products. Therefore, there will be less use of PPPs to control pests, ideally resulting in less damage to associated species.
- AECM 6A – Measure for the integration and maintenance of autochthonous Maltese species – Maltese Black Chicken;
- AECM 6B – Measure for the integration and maintenance of autochthonous Maltese species – Maltese Ox;
- AECM 6C - Measure for the integration and maintenance of autochthonous Maltese species – Carob & Mulberry;

II. Sustainable use and conservation of biodiversity for food and agriculture

2.1 Sustainable use

a) List in Table 4 management and diversity based practices that support the maintenance and use of biodiversity for food and agriculture in production systems.

Table 4. Management and diversity based practices that support the maintenance and use of biodiversity for food and agriculture in production systems.

| Production system | Management/diversity based practice | Trends in the application of the practice over the past ten years |
|--|--|--|
| Livestock landless systems | N/A | No information on trends is available. |
| Self-recruiting capture fisheries | Ecosystem approach in capture fisheries | Increased trend in the management of fisheries diversity is seen through the application of EU and national legislation. Malta is monitoring and regulating fisheries and thus leading to the better |

| | | |
|---|--|--|
| | | management of biodiversity. Improved diversity can be seen in fisheries such as the bluefin tuna capture fisheries; the status of this stock is following the desired trends laid out in the recovery plan started with the auspices of ICCAT in 2007. Such management measures attempt to minimize by-catch and reduce the catches of juveniles to control the human impact on the ecosystem. |
| Fed aquaculture | Ecosystem approach in capture fisheries | The ecosystem approach is applied to bluefin tuna mariculture for the fattening of fish which relies on capture of wild fish. Individuals which are below the minimum size threshold are avoided and catches are based on quotas. Furthermore, attention to the accidental capture of bycatch species is given, including marine mammals. |
| Irrigated crops (other); Rainfed crops | <ol style="list-style-type: none"> 1) Integrated Plant Nutrient Management (IPNM) 2) Integrated Pest Management(IPM) 3) Pollination Management 4) Landscape management and Sustainable soil management practices 5) Organic agriculture 6) Conservation agriculture 7) Water management practices and water harvesting 8) Areas designated by virtue of production features and approaches | <p>Management practices have supported the maintenance and use of biodiversity for food and agriculture in crop production systems through the following means:</p> <ol style="list-style-type: none"> 1) Adequate and sustainable controlled use of manures as stipulated in the EU Nitrates Directive, using of fertilizer plans; 2) Integrated pest management emphasizing the growth of a healthy crop with the least possible disruption to agro-ecosystems and encouraging natural pest control mechanisms. This is also listed in the Malta's Rural Development Programme 2014-2020 (RDP); 3) Pollination especially in green houses focused on the use of bee boxes and was encouraged also through Agri-Environment-Climate Measures (AECM) 3 of the RDP; 4) Encouraging farmers to engage in best practices concerning water and soil management, ensuring biodiversity conservation. Specific reference to this practice is made in the Chapter 236 Fertile Soil (Preservation) Act of the Laws of Malta; 5) Promoting organic farming, in compliance with local and EU legislation; 6) Encouraging crop rotation and other techniques of soil preservation such as |

| | | |
|--|--|---|
| | | using mulch; 7) Reducing farmer dependence on ground water abstraction by encouraging investments in reservoirs and smart irrigation methods; 8) Recognizing important landscape areas such as garrigue which is an important landscape for honey bee foraging. |
|--|--|---|

BOX 2. Describe a successful programme or project that has been undertaken in the country to support one of the practices listed in Table 4.

The LIFE BAĦAR for N2K (LIFE12 NAT/MT/000845) project¹² was completed in 2014 with the support of co-financing by the EU LIFE funding programme. The project aimed to extend existing marine Sites of Community Importance (SCIs) and identify new SCIs for inclusion within the Natura 2000 network of the EU. The designation of these areas focused, mainly but not exclusively, on the occurrence of *Posidonia oceanica* meadows which compose important spawning and nursing areas for marine life. The protection of these areas is expected to contribute to the ability of the surrounding marine ecosystem to withstand fishing pressure, and therefore indirectly contribute to the sustainability of fishing activities around the Maltese archipelago.

b) Provide examples whereby the diversity per se, or its lack, had a direct effect on productivity; food security and nutrition; rural livelihoods; ecosystem services; sustainability; resilience; or sustainable intensification.

For the plant pests and diseases, no known varieties that are resilient to the invading pathogens observed over the past years are cultured in Malta; the lack of resistant or tolerant varieties was therefore a contributing factor in the change observed in food security and productivity. Pest control activities generally managed to avoid complete decimation of the affected production sectors. In the case of the wood borer *Phrynetia leprosa*, damage of the mulberry tree population has been quite severe resulting in the elimination of approximately 90% of the local trees. The cost of such damage in terms of biodiversity loss and loss of associated biodiversity has not been quantified. The severe impact on local production has resulted in decreased harvests and ripple effects on the local markets, with increases in produce cost. The impact on local fig trees by *Hypocrypahlus scabricollis* has been equally serious, resulting in profit losses for local farmers since local figs are profitable and in high demand. The costs of such damage in terms of biodiversity loss, productivity, food security and nutrition, rural livelihoods, and sustainability have not been formally evaluated but may be considered important.

In livestock production, deficiencies result in partial reliability on external markets for the importation of beef, lamb, poultry, and pork as meat and meat products. At the local level, the lack of livestock genetic diversity may be a problem affecting productivity particularly where autochthonous breeds are concerned, although this phenomenon is not generally formally quantified. Imported livestock was not observed to result in disease incidence which affected local food biodiversity over the past 10 years.

In fisheries, the adoption of an ecosystem approach related to the bluefin tuna fishery, which takes account of population dynamics of the stock has provided positive results in restoring the stock to safe sustainability levels; attention to bycatches and the impact of mariculture pertinent to this fishery has been given, however, targeted assessments to determine how the measures taken in this fishery have impacted other species is not available. The “Strategic Environmental Assessment On Malta’s Aquaculture Strategy” for carrying out environment impact assessments is available at national level in relation to aquaculture and its impact on the surrounding environment.

¹² <http://lifebahar.org.mt/>

c) List in Table 5 examples whereby the use of biodiversity for food and agriculture contributed to cope with climate change, invasive alien species, and natural or human-made disasters.

Table 5. Examples whereby the use of biodiversity for food and agriculture (BFA) contributed to cope with climate change, invasive alien species, and natural or human-made disasters

| Objective | Description |
|---|-------------|
| Use of BFA to adapt to and mitigate climate change | N/A |
| Use of BFA to manage the spread of/control invasive alien species | N/A |
| Use of BFA to prevent natural or human-made disasters and/or reduce their effects on livelihoods, food security and nutrition | N/A |

d) List and briefly describe ecosystem/landscape/seascape approaches that have improved the management and use of BFA in the country.

- In agriculture, Malta adheres to EU regulatory requirements in terms of use of pesticides, biological controls, and biostimulants, and in particular connection to the Common Agricultural Policy (CAP). The measures stemming from the CAP have promoted the development of agricultural practices preserving the environment and safeguarding the countryside.
- Capture fisheries make use of selective gears which attempt to minimize juvenile catches; these are implemented through measures such as minimum mesh sizes, number of hooks, as well as limitations on the number of vessels which may participate in certain fishing activities, among others.
- During the establishment of its bluefin tuna aquaculture areas in Malta’s marine waters, Malta carried out an environment impact assessment in order to ensure that the fish production activities carried out therein would neither negatively impact the surrounding ecosystems, nor be of detriment to other users of the marine and coastal areas. This resulted in the identification of suitable sites. The Environment and Resources Authority requires that the impact assessment is updated periodically by the aquaculture users of the marine areas. This enables the authorities to identify any imminent risks to the environment and request remedial action. The same bluefin tuna aquaculture fishery is governed by an international regulatory system which adopts the ecosystem approach, by instituting closed fishing periods, catch limits and monitoring, as well as selective gears to minimize by-catch and reduce the catches of juveniles to control the human impact on the ecosystem.

e) Provide examples of activities undertaken to maintain and use traditional knowledge of associated biodiversity and wild foods.

Malta was involved in two notable projects which aimed to restore and conserve local varieties, landraces and crop wild relatives of agricultural importance:

- In 2015 the Plant Protection Directorate embarked on a project under the auspices of the Ministry for the Environment, Sustainable Development, and Climate Change, with the collaboration of Nature Trust Malta between January 2013 and September 2015, and which was co-financed by the European Agricultural Fund for Rural Development (EAFRD) under Measure 214, Sub-Measure 10 (Support for the Conservation of Genetic Resources in Agriculture.) This project resulted in the production of a

small botanic garden hosting landraces and crop wild relatives amongst other plants which are of national importance and at risk of being lost.

- Another project titled 'Sharing Seeds, Sharing Life' aiming to safeguard local heirloom and landrace seeds, as well as raising awareness about traditional farming practices and cultures was launched in 2017; this project aimed to provide information on locations of ethnobotanical interest.

f) Identify possible needs and priorities in terms of the sustainable use of biodiversity for food and agriculture, and in particular of associated biodiversity and wild foods.

- Malta is prioritizing the drawing up of a register of national genetic resources for food and agriculture to establish baselines, devise management strategies if required and better understand priority allocation at the national level;
- In terms of sustainable use of genetic resources, there is need to establish characterization and evaluation data, particularly for important crops, which may be used to improve in situ management of landraces, crop wild relatives and wild food species;
- There may be need to determine if current national biodiversity is sufficient to address current sustainability challenges and identify solutions how this may be improved;
- There is need to build knowledge in relation to biodiversity and wild foods associated with genetic resources for food and agriculture; comprehensive knowledge building exercises are generally carried out in conjunction with funded projects due to the fact that funds and dedicated expertise are limiting factors;
- Over recent years, the need for temporary closed fishing areas has been identified in order to address deficiencies in populations of swordfish, bluefin tuna, and associated species; these have been implemented at regional level in the Mediterranean.

2.2. Conservation

a) Describe the status of in situ conservation of associated biodiversity and wild food species in your country:

1. List and describe any existing national in situ conservation initiative(s).

For the protection of wild birds and rabbits, the Wild Birds Regulation Unit (WBRU) was established within the Parliamentary Secretariat for Agriculture, Fisheries and Animal Rights following Government's decision in May 2013 to centralize the relevant regulatory functions pertaining to implementation of the Conservation of Wild Birds Regulations (S.L. 549.42) and related subsidiary legislation, and to oversee and drive the implementation of Government policy in relation to sustainable hunting governance and wild birds conservation. To better execute its duties towards in situ conservation of wild birds, the Wild Birds Regulation Unit has a Specialist Enforcement Branch, which is tasked with the enforcement and supervision of compliance with the Conservation of Wild Birds Regulations and other subsidiary legislation for which the Unit is responsible. In exercising its duties, the Specialist Enforcement Branch coordinates with other law enforcement entities, including, the Malta Police Force, the Armed Forces of Malta, Customs, as well as with the Monitoring and Compliance Unit of the Environment and Resources Authority. The Specialist Enforcement Branch has a wide range of responsibilities, including the monitoring and investigation of crimes related to wild birds and rabbit, providing advice, gathering intelligence, and informing the public and stakeholders.

The Wild Birds Regulation Unit is also responsible for the coordination of a number of conservation programmes and initiatives. The Special Initiatives section is responsible for coordination of captive breeding programmes, species reintroduction programmes, educational and awareness raising campaigns, promotion of sustainable and wise use of natural resources and participation in conservation workshops and seminars.

2. Indicate which species/groups of species are being conserved and with what objective(s).

The Conservation of Wild Birds Regulation aims to provide for the protection, management and control of all naturally occurring wild birds and their nests, eggs and habitats within Malta. It serves to ensure that all wild

birds receive basic protection from illegal trapping and illegal killing; that sufficient habitat is protected to assure the survival of threatened and migratory species; that large-scale or non-selective means of taking birds are prohibited; and that the exploitation, sale or commercialization of most species is prevented. It also seeks to protect all wild birds and the habitats of listed species through the designation of specially protected areas (SPAs), which are incorporated in the Natura 2000 network established by the Habitats Directive 92/43/EEC.

3. Describe any existing subregional/regional in situ conservation initiative(s) the country is involved in.

Given the small size and particular characteristics of the Maltese islands, all conservation initiatives undertaken by Maltese authorities to conserve wild birds are carried out at a national level and no specific subregional or regional in situ conservation initiatives have been implemented.

b) Describe the status of ex situ conservation of associated biodiversity and wild food species in your country:

1. List and describe any existing national ex situ conservation initiative(s).

The Government of Malta has in 2013 established the Wild Birds Regulation Unit as a branch responsible for the conservation of game animals. The Wild Birds Regulation Unit has the capacity to promote and oversee conservation programs. In 2016, the WBRU together with one of the main hunting organizations, have embarked on a re-introduction project concerning the Barn Owl (*Tyto alba alba*) a species extinct locally for over 40 years. Necessary research permits and preparations are well underway and the project is envisaged to be officially launched in the coming months.

In relation to plant biodiversity for food and agriculture, a number of ex-situ conservation initiatives have been undertaken over recent years:

- In 2011, the Presidential kitchen gardens were involved in a project to establish a botanic garden hosting local plant varieties and crops, which is accessible to the public and intended to raise public awareness about Malta's genetic heritage.
- In 2015, Malta completed a project titled 'Study And Sustainable Conservation Of Varieties Of Local Plants'; this project aimed towards the sustainable conservation of plant genetic resources in agricultural and natural ecosystems, and the reversal in the trend of their genetic erosion. The project specifically focused on a number of local landraces and varieties of cultivated plants and indigenous wild species under a high threat and at risk of disappearance. Furthermore, such plants, being of traditional, agricultural and cultural importance, needed to be conserved because they form a part of Malta's national identity. The project contributed effectively to enhance communication, education and public awareness on the valuable genetic resources of the Maltese Islands and their sustainable use. The outcomes of the project were: the ex situ conservation of local landraces of agricultural crops and their wild relatives found in nature by the establishment of a seed collection for storage and through regeneration by cultivation in a botanical garden; the establishment of a knowledge base on national crop biodiversity; the creation of educational platforms to inform and engage the general public about national plant biodiversity; and, the characterization and propagation of a number of locally important citrus plants.
- In March 2017, the National Hub for Ethnobotanical Research launched a participatory action research project titled 'Sharing Seeds, Sharing Life' aiming to safeguard local heirloom and landrace seeds. The research study attempts to establish a way forward to tangible solutions from farmer and stakeholder roundtable discussions held in 2014 and 2015 by The National Hub for Ethnobotanical Research. Aside from producing a number of recommendations for stakeholders and policy makers, and establishing a space to facilitate networking across different culture groups, the Hub designed a mapping tool to tag and provide information on locations of ethnobotanical interest. The map is intended to be openly accessible to everyone to be used to both share and buildup on the knowledge base that has been collected throughout this research.

2. Indicate which species/groups of species are being conserved and with what objective(s).

Conservation of crops, landraces and wild crop relatives focuses on research and education, as well as the preservation of specimen for future generations:

- The Presidential kitchen gardens host varieties of local crops;
- Specimens of local plants are conserved at the Argotti Botanic gardens, for taxonomic classification and education purposes. The garden includes collections of indigenous and Mediterranean flora, cacti and succulents, as well as specimen of wild plants of national importance.
- A number of local wild plants, crop wild relatives, landraces and local crop varieties are hosted in the botanical garden resulting from the 'Study And Sustainable Conservation Of Varieties Of Local Plants'; the garden. Their conservation aim is to provide samples for education and to host samples of genetic resources of national importance in the eventuality of their loss from the wild, albeit at a small scale. The garden includes, among others, specimen of:

Punica granatum L. ; *Ficus carica* L. ; *Ceratonia siliqua* L. ; *Prunus dulcis* (Mill.) D.A.Webb ; *Olea europaea* L. ; *Pyrus communis* L. ; *Morus nigra* L. ; *Morus alba* L. ; *Malus sylvestris* (L.) Mill. ; *Cydonia oblonga* Mill. ; *Eriobotrya japonica* (Thunb.) Lindl. ; *Prunus domestica* L. ; *Prunus persica* (L.) Batsch. ; *Juglans regia* L. ; ; *Pinus halepensis* Mill. ; *Quercus ilex* L. ; ; *Tetraclinis articulata* (Vahl)Mast. ; *Myrtus communis* L. ; *Laurus nobilis* L. ; *Chamaerops humulis* L. ; *Pistacia lentiscus* L. ; *Rhamnus alaternus* L. ; *Cercis siliquastrum* L. ; *Crataegus monogyna* Jacq. ; *Anagyris foetida* L. ; *Spartium junceum* L. ; *Phillyrea latifolia* L. ; *Juniperus phoenicea* L. ; ; *Populus alba* L. ; *Fraxinus angustifolia* Vahl ; *Vitex agnus-castus* L. ; *Ulmus canescens* Melville ; *Salix alba* L. ; *Salix pedicellata* Desfontaines ; *Sambucus nigra* L. ; *Celtis australis* L. ; ; *Euphorbia dendroides* L. ; ; *Phlomis fruticosa* L. ; *Erica multiflora* L. ; *Sarcopoterium spinosum* (L.) Spach ; *Rosmarinus officinalis* L. ; *Jacobaea maritima* (L.) Pelser & Meijden ; *Teucrium fruticans* L. ; *Coronilla valentina* L. ; *Cistus creticus* L. ; *Cistus monspeliensis* L. ; *Teucrium flavum* L. ; *Hypericum aegypticum* L. ; *Ruta chalepensis* L. ; *Convolvulus oleifolius* Desr. ; *Thymbra capitata* (L.) Cav. ; *Periploca angustifolia* Labill. ; *Prasium majus* L. ; ; *Helichrysum melitense* (Pignatti) Brullo, Lanfranco, Pavone & Ronsisvalle ; *Palaeocyanus crassifolius* (Bertol.) Susanna ; *Cremnophyton lanfrancoi* ; *Matthiola incana* subsp.melitensis Brullo, Lanfranco, Pavone & Ronsisvalle ; *Darniella melitensis* (Botschantzev) Brullo ; *Hyoseris frutescens* Brullo and Pavone ; *Suaeda vera* Forssk. ex J.F.Gmel. ; *Silene fruticosa* L. ; ; *Urginea pancration* (Steinheil) Philippe ; *Iris pseudopumila* Tineo ; *Iris sicula* Todaro ; *Narcissus tazetta* L. ; *Asphodelus aestivus* Brot. ; *Ferula communis* L. ; *Papaver rhoeas* L. ; *Glaucium flavum* Crantz ; *Daucus gingidum* ; *Cynara cardunculus* L. ; *Asparagus aphyllus* L. ; *Calendula suffruticosa* Vahl ; *Borago officinalis* L. ; *Lactuca serriola* L. ; *Antirrhinum* sp. ; *Dactylis hispanica* ; *Dittrichia viscosa* (L.) Greuter ; *Acanthus mollis* L. ; *Carex extensa* ; *Hyparrhenia hirta* (L.) Stapf ; *Lygeum spartum* Loefl. ex L. ; *Piptatherum miliaceum* (L.) Coss. ; *Capparis spinosa* L. ; *Anthyllis hermanniae* subsp. melitensis Brullo & Giusso ; *Halimione portulacoides*(L.) Aellen ; *Limbarda crithmoides*(L.) Dumort ; *Antirrhinum tortuosum* Bosc ; *Antirrhinum siculum* Miller ; *Crithmum maritimum* L. ; *Atriplex halimus* L. ; ; *Vitis Vinifera* L. ; ; *Cynara scolymus* Linn ; *Spinacia oleracea* L. ; *Petroselinum crispum* (Mill.) Nym. ; *Allium sativum* L. ; *Allium ampeloprasum* var. *porrum* L. ; *Daucus carota* subsp. *sativus* ; *Vicia faba* L. ; *Beta vulgaris* subsp. *Vulgaris*.

In relation to game animals, the Barn owl project will focus on reinstating the Barn owl (*Tyto alba alba*) back into the Maltese countryside with the aim of re-establishing a key stone species with a viable breeding population, increase and maintain biodiversity and provide long-term economic benefits to local people.

3. Describe any existing subregional/regional in situ conservation initiative(s) the country is involved in.

Given the small size and particular characteristics of the Maltese islands, all conservation initiatives undertaken by Maltese authorities to conserve wild birds are carried out at a national level and no specific subregional or regional in situ conservation initiatives have been implemented.

c) Identify possible needs and priorities in terms of the conservation of biodiversity for food and agriculture, and in particular of associated biodiversity and wild food species.

- Research and establish the main pressures and threats that are affecting the decline in bird populations;
- Adopting a priority approach to tackle the most influencing factors affecting populations over other less important factors;
- Take the necessary precautions and steps to tackle the issue of habitat loss and find ways how to mitigate the effects of agriculture on biodiversity;
- The identification of national heritage of genetic resources for food and agriculture is also an essential component to be able to target conservation efforts;
- The establishment of a genebank will be a requisite to enable the preservation and sharing of national plant genetic resources for food and agriculture.

2.3 Access and exchange

a) Describe in Table 6 the main measures in the country (i) regulating access to; and (ii) ensuring the fair and equitable sharing of benefits arising from the utilization of biodiversity for food and agriculture (BFA).

Table 6. Description of the main measures in the country (i) regulating access to; and (ii) ensuring the fair and equitable sharing of benefits arising from the utilization of biodiversity for food and agriculture (BFA).

| Components of BFA | Description of measures governing access to BFA | Description of measures regulating the fair and equitable sharing of benefits arising from the utilization of BFA |
|--|---|---|
| Genetic resources for food and agriculture | Subsidiary Legislation 549.111 establishes access measures at national level for the Republic of Malta in line with the Nagoya Protocol to the Convention on Biological Diversity; users are required to obtain Prior Informed Consent before access may be granted for the utilization of genetic resources. | Subsidiary Legislation 549.111 establishes benefit sharing measures at national level for the Republic of Malta in line with the Nagoya Protocol to the Convention on Biological Diversity; users are required to enter into Mutually Agreed Terms before they may legally utilize genetic resources for research or development. |
| Plant | Subsidiary Legislation 549.111 is applicable to plant BFA which is excluded from the provisions of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). | Subsidiary Legislation 549.111 is applicable to plant BFA which is excluded from the provisions of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). |
| Animal | Subsidiary Legislation 549.111 is applicable to animal BFA. | Subsidiary Legislation 549.111 is applicable to all animal BFA. |
| Forest | Subsidiary Legislation 549.111 is applicable to all forest BFA. | Subsidiary Legislation 549.111 is applicable to all forest BFA. |
| Aquatic | Subsidiary Legislation 549.111 is applicable to all aquatic BFA. | Subsidiary Legislation 549.111 is applicable to all aquatic BFA. |

| | | |
|-------------------------|---|---|
| | Specialized access legislation exists at national level for access to aquatic genetic resources from the wild. In fisheries this is Chapter 425 of the Laws of Malta. | |
| Associated biodiversity | No specific measures exist for associated biodiversity in the context of access and benefit sharing; all resources are regulated based on direct access or utilization. | No specific measures exist for associated biodiversity in the context of access and benefit sharing; all resources are regulated based on direct access or utilization. |
| Micro-organisms | N/A | N/A |
| Invertebrates | N/A | N/A |
| Vertebrates | N/A | N/A |
| Plants | N/A | N/A |
| Wild foods | No specific measures exist for wild food biodiversity in the context of access and benefit sharing; all resources are regulated based on direct access or utilization. | No specific measures exist for wild food biodiversity in the context of access and benefit sharing; all resources are regulated based on direct access or utilization. |

b) Identify possible needs and priorities in terms of the policies and regulations governing the access to and ensuring the fair and equitable sharing of benefits arising from the utilization of biodiversity for food and agriculture, and in particular of associated biodiversity.

Malta's needs and priorities are outlined in the National Biodiversity Strategic Plan 2012-2020, of which the main objective is to ensure that biodiversity is integrated in the relevant policies that directly or indirectly affect biodiversity. As indicated in the National Biodiversity Strategic Plan 2012-2020, the target is to maintain the genetic diversity of farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, and to develop and implement strategies for minimizing genetic erosion and safeguarding their genetic diversity. Improving the economic and cultural value of local resources and products can facilitate the protection of the national biodiversity.

Dedicated access and benefit sharing laws have been established as of 15 November 2016, therefore, any assessment of their effectiveness is premature. A new legal instrument may be required at national level to more clearly address genetic resources under Annex I of the ITPGRFA and establish material transfer agreements as mandatory.

III. Policies, institutions and capacity

3.1 Policies, programmes, institutions and other stakeholders

a) Describe relevant policies and programmes the country has adopted and is implementing to support the conservation and sustainable use of biodiversity for food and agriculture, and specify to which extent they address associated biodiversity and wild foods. Relevant policies and programmes are those that aim at:

- the coordinated use and conservation of sectoral genetic resources
- addressing food security and nutrition
- the sustainable use and conservation of associated biodiversity
- the maintenance of ecosystem services
- improving resilience and sustainability of production systems

- supporting farmers, livestock keepers, forest dwellers and fisher folk to adopt and maintain practices that strengthen the conservation and use of biodiversity for food and agriculture
- the application of an ecosystem/landscape/seascape approach

The Agri-Environment-Climate Measures (AECM) established through the rural development programme for Malta 2014-2020 support activities that aim to address food security and nutrition, maintain ecosystem services, improve resilience and sustainability of production systems and support farmers and livestock keepers, amongst others.

Matters related to conservation of wild birds, including activities such as hunting, trapping and trade in wild birds are regulated primarily through the Conservation of Wild Birds Regulations, 2006 (S.L. 549.42), which in turn, transposes obligations of the EC Birds Directive 2009/147/EC. The Conservation of Wild Birds Regulations (SL 549.42) establishes general parameters regulating hunting and taking of birds, lays down general prohibitions, lists protected species, areas where hunting is not allowed and other restrictions.

The legal framework in Malta addressing harmful organisms for plants is established by the Plant Quarantine Act, 2001 (Act No. XVIII of 2001,) which foresees the inspection of growing plants, areas under cultivation, and plants and plant products in storage or locally in transit, in order to report and control the existence, outbreak and spread of plant pests or pathogens.

Subsidiary Legislation 433.25 is of particular importance in assuring that any seeds of agricultural landraces and varieties produced and placed on the market in Malta, meet specified standards of quality. The legal instrument transposes Commission Directive 2008/62/EC and aids landraces and varieties which are naturally adapted to local and regional conditions and threatened by genetic erosion to be grown and marketed even when they do not comply with the general requirements as regards the acceptance of varieties and the marketing of seeds and seed potatoes.

Subsidiary Legislation 433.27 concerns seeds of vegetable landraces and varieties, and transposes Commission Directive 2009/145/EC providing for certain derogations for the acceptance for inclusion of vegetable landraces and varieties in national catalogues of varieties of vegetable species as provided for in the Seeds of Agricultural Plants and Vegetables Regulations, 2010 to ensure the sustainable use of such plant genetic resources through growing.

Similarly, Subsidiary Legislation 433.28 transposes Commission Directive 2010/60/EU providing for certain derogations for the marketing of fodder plant seed mixtures intended for use in the preservation of the natural environment in order to assure that any such fodder plant seed mixtures that are produced and placed on the market in Malta meets specified quality standards.

Malta became party to the Nagoya Protocol on 1 March 2017. Subsidiary Legislation 549.111 implementing the Nagoya Protocol involves authorities pertinent to the conservation of biodiversity in the decision making to provide access by informed consent and provides a means for the profits coming from the use of genetic resources to be shared with Malta for investment in conservation. Similarly, Malta became a signatory to the International Treaty for Plant Genetic Resources for Food and Agriculture (ITPGRFA) on 10 May 2002, and the instrument entered into force for Malta on 20 February 2017. At national level, Malta is committed to implement the ITPGRFA and recognizes the importance of farmers in food security at the national and global levels, and of providing facilitated access to important plant genetic material to farmers, plant breeders and scientists.

b) Provide a short analysis of the strengths and weaknesses of the policies and programmes mentioned above and indicate their level of implementation.

Both the Plant Quarantine Act, 2001 (Act No. XVIII of 2001) and the Subsidiary Legislations 433.25, 433.27, and 433.28 establish a system which guarantees that high quality and healthy plant material is available on the local market. This is essential in preventing the spread of harmful organisms and securing productivity. However, Subsidiary Legislations 433.25, 433.27 and 433.28 are implemented with difficulty because the EU marketing law on landraces/varieties is resource demanding; however, local landraces/varieties constitute very small local niche markets and the financial and administrative burdens incurred in order to abide to these provisions outweigh the market value of the plant material in question.

The Conservation of Wild Birds Regulations (SL 549.42) was amended in 2013 and strengthened the legal deterrent against bird-related crime and rendered the present system of dealing with certain types of offences much more effectively. The amendments resulted in a considerable increase in the penalties for all types of offences, the inclusion of a number of minor offences that are subject to swift automatic administrative fines, and the introduction of a probationary system and possibility of mandatory community service as part of the range of applicable penalties. Offences involving illegal targeting of wild birds incur the harshest penalties, which include imprisonment of up to 2 years, a fine of up to €15,000, confiscation of the *corpus delicti* and revocation of a hunting licence for life. These penalties may be considered to be amongst the harshest in the EU. Among the other additions of the updated legal system are:

- a new administrative fine system for minor offences which resulted in an unprecedented 99.6% rate of collection of *Carnet de Chasse*, which has in turn also improved the precision of autumn hunting statistics;
- Increased legal deterrents against the most serious bird-related crime which involves the targeting of protected species listed in Schedule I and Schedule IX of the Conservation of Wild Birds Regulations (SL 549.42).
- Automatic and stronger penalties for any hunting or taking, or attempting to hunt and or take protected bird species listed in Schedules I and IX;
- Introductions of an interactive reporting system and immediate reporting of catches, which improved enforcement and scientific data collection.

BOX 3. Provide up to three examples to highlight how stakeholder groups in the country, such as groups or associations of farmers, forest dwellers, fisher folk and livestock keepers, NGOs or other civil society organizations, have actively contributed to the improved sustainable use and/or conservation of biodiversity for food and agriculture and the maintenance of ecosystem services.

Malta started an ongoing project titled LIFE+ Life Saving Buskett in July 2013, which involved a number of groups for the restoration of the only example of semi-natural woodland in the Maltese Islands possessing a variety of endemic and rare species needing protection. The area hosts habitats of interest within the Natura 2000 map, among which are olive and carob forests.

The project aimed towards the protection of the watercourses and substrata supporting the existing habitats, as well as removing alien invasive species that compete with targeted habitats and plant new trees characteristic of the those habitats. Other measures to restore the historical and cultural status of the location were also taken. The project engaged pupils from six schools in reforestation activities involving indigenous trees, including carob, oak, olive, pine and bay laurel, as part of an event held to mark Arbor Day. The event was organized by the national stakeholders committee on behalf of the Environment Ministry's Parks directorate. Pupils were toured with the assistance of various experts during the activity to educate and raise their awareness to appreciate the woodland. Hand-on educational sessions were held in relation to the identification of woodland lichens, as well as trees and measuring their age, girth and height, hunting for scavengers, plant pest control and the countryside code.

The trees planted are intended to form part of a wider initiative of an international NGO – ENO – Environment Online, which is present in more than 150 countries through a virtual network of educators. ENO made a commitment at the 2012 UN Rio+20 Summit to plant 100 million trees by the end of 2017. The Saving Buskett

project, which is co-financed by the EU Lifeplus funding programme, is expected to be completed by May 2018.¹³

c) Provide examples of successful interministerial cooperation in the area of conservation and sustainable use of biodiversity for food and agriculture and describe the relevant collaboration mechanisms.

- In 2013, a project titled 'Life Bahar for N2K' was initiated with the aim to extend existing marine Sites of Community importance (SCIs), if necessary, and to designate new marine areas as SCIs to form part of the Natura 2000 network. The project involved cooperation between the Environment and Resources Authority, the Ministry of Sustainable Development, the Environment and Climate Change (MSDEC), the Department of Fisheries and Aquaculture (DFA), the University of Malta (UoM) and Fundación Oceana. An important aspect of the project was to achieve active participation by stakeholders by providing a platform for discussion throughout the whole project and discuss necessary actions.
- The project titled 'Study And Sustainable Conservation Of Varieties Of Local Plants' resulted in the production of educational facilities, awareness raising media, a knowledge base on local landraces/varieties and wild crop relatives. The project was implemented by the Plant Protection Directorate under the auspices of the Ministry for the Environment, Sustainable Development, and Climate Change, with the collaboration of Nature Trust Malta between January 2013 and September 2015, and was co-financed by the European Agricultural Fund for Rural Development (EAFRD) under Measure 214, Sub-Measure 10 (Support for the Conservation of Genetic Resources in Agriculture.)
- The project titled 'Sharing Seeds, Sharing Life' involved the participation of local government entities, NGOs, researchers and farming communities and served as to initiate dialogue between different stakeholders on local agricultural practices. The project resulted in a number of recommendations as well as a community mapping tool to aid in the identification of local agricultural and wild biodiversity.
- Malta's Directorate for Competitiveness and Diversification intends to develop contact with the Climate Change Unit within Malta Resources Authority. We intend to show that certain Maltese agricultural varieties can withstand drought so can be good candidates as part of our National climate change mitigation measures. Once certain traits are verified then one can start developing new varieties based on such traits.

d) Identify possible needs and priorities in terms of policies, programmes and institutions governing biodiversity for food and agriculture, and in particular associated biodiversity and wild food species.

- In relation to resources for food and agriculture, updated knowledge is lacking and an inventory of biodiversity in this context is required to enable its efficient management. Malta has already commenced work to inventory plant genetic resources for food and agriculture, however further work is required in order to obtain a comprehensive inventory which also includes valuable farm animal breeds. The creation of a database with this information is envisaged to take place over the coming years.

Additionally, Malta intends to establish its first national genebank to preserve important indigenous or endemic plant species and varieties; funds for this endeavour need to be identified in order to develop the suitable infrastructure as well as the capacity required for its long-term management. This structure would play a key role in monitoring and preventing genetic erosion at the national level as

¹³ <http://lifesavingbuskett.org.mt/>

well as function as an exit point for the exchange of germplasm where necessary for research and crop improvement.

- Further awareness needs to be raised, particularly to involve research institutions in developing the knowledge available on local biodiversity for food and agriculture, and in particular associated biodiversity and wild food species. This intelligence is also of importance to enable the national authorities to identify risk species as well as develop indicators to monitor the status, trends and changes of plant genetic resources for food and agriculture, especially at the genetic level.
- Management of biodiversity with regards to marine resources is closely linked to a need for increased scientific data on concerned species, which would also help on raising awareness on the current status of the targeted and associated stocks, therefore leading in the better management.

3.2 Capacity

a) Identify and prioritize training and education needs that target the conservation and sustainable use of associated biodiversity and describe possible constraints.

- Capacity building is seen as a need in various sectors; collaboration and exchange of expertise between institutions is essential for the relevant managing entities to be up to date and be equipped with the necessary skills and tools to manage biodiversity in production systems.
- Training to identify and characterize plant varieties and animal breeds, as well as managing their ex situ and in situ conservation is lacking; Chronic constraints include lack of funding in maintaining the present stock of genetic resources. Lack of networking to identify foreign entities that are capable to offer specialized training is also identified.

b) Identify and prioritize research needs to strengthen the conservation and sustainable use of associated biodiversity, wild foods and ecosystem services and describe possible constraints.

- Research on local genetic resources for food and agriculture is lacking at various level. Better coordination with research institutions and managing entities is required to spearhead resources towards common and focused goals. Cooperation with specialized institutions is also of importance in order to fill knowledge gaps through joint research; for instance, the genetic composition and biochemistry of the majority of the genetic resources for food and agriculture available in Malta are unknown.
- Comparative trials of autochthonous breeds and varieties with commercial ones are necessary to identify their properties and adaptations against biotic and abiotic stresses; the potential and value in commercial interest of local wild food crops is generally unknown.

IV. Regional cooperation

4.1 Regional initiatives the country is involved in to conserve and use biodiversity for food and agriculture

a) Describe in Table 7 relevant regional policies and programmes embedding the conservation and/or use of biodiversity for food and agriculture, and in particular associated biodiversity, wild food species and ecosystem services.

Table 7. Description of relevant regional policies and programmes that embed the conservation and/or use of biodiversity for food and agriculture, and in particular associated biodiversity, wild food species and ecosystem services.

| Regional policies and programmes | Description |
|---|---|
| National programme for the collection of plant and animal genetic resources | Between 2014 and 2017, the Diversification & Competitiveness Directorate responsible for monitoring changes in consumer demands and guide producers towards increased productivity, has embarked on a national programme to collect agricultural genetic material from growers. To date we have established in situ populations of various crops. |
| National Biodiversity Strategic Plan 2012-2020 | The plan encompasses various fields involving genetic resources and its main objective is to ensure that biodiversity is integrated in the relevant policies that directly or indirectly affect biodiversity. |

4.2 Needs and priorities

a) Identify possible needs and priorities in terms of embedding biodiversity for food and agriculture, and in particular associated biodiversity, wild foods and ecosystem services into regional and international initiatives.

Among the different sectors of biodiversity management, the following needs and priorities may be identified:

- Develop and share capacity and resources among at regional and international level to enable a level-playing field in the management and conservation of biodiversity for food and agriculture, particularly:
 - To cope with crises arising from exceptional scenarios, such as drastic climate fluctuations from year to year;
 - To share knowledge to address invasive alien species that may be of threat to crop wild relatives and wild food and feed species;
 - To characterize and evaluate germplasm for important food and feed species;
 - Crop improvement to increase the genetic diversity at various scales whilst maintaining local biodiversity of food and feed species.
- Develop cooperation networks at regional level, whilst involving food production communities and NGOs;
- Carry out joint studies on the biology, genetics, ethnic value and ecology of crop wild relatives and wild food species, at regional level;
- Establishment of regional ex-situ conservation facilities to preserve genetic diversity for food and agriculture.
- Collaboration with neighboring countries on ex situ conservation is essential in terms of managing biodiversity, wild foods and ecosystem services.
- Management of biodiversity with regards to marine resources may need to be improved at international level. This would be closely linked to a need for increased concerted contribution to scientific data on concerned species, which would also help on raising awareness on the current status of the targeted and associated stocks, therefore leading in the better management. Such needs and priorities are generally channeled at regional level through active participation in organizations such as the GFCM and ICCAT. The need for stronger joint efforts was incorporated in the MEDFish4Ever Ministerial Declaration signed in 2017 to concretize the common goal to increase control and improve the status of fish stocks of the Mediterranean region.