MALTESE ALC

PART A

1. INTRODUCTION

The extent of formal provision for grading agricultural land varies considerably between countries. As part of good land-use planning system it is widely held that different types of agricultural land should be identified according to their inherent qualities so that relevant conservation measures could be applied. It is within this line of thought that this work is expected to substantially contribute in fulfilling the requisites of **Policy AHF 3** set out in the Structure Plan of the Maltese Islands.

Prior to this work, studies relating specifically to standardise a method of classifying local agricultural land has never been attempted. As a consequence, past land assessment studies in general that were commissioned from time to time, have so far, been based mainly on empirical, highly subjective observations leaning heavily on such criteria as, type of crops under cultivation and whether or not any water source/s exists on site. Clearly, such a rudimentary approach cannot address fully the main issues dealing with the actual capability of any agricultural land (which is the principle objective of this work).

Traditionally, the need to establish a valid system to classify agricultural land has arisen from the need to assess the risk of soil erosion mainly in arable or pasture land. At face value, local farmers and indeed others elsewhere are not always in full agreement with this. Their conceptual approach towards land valuation is decidedly and instinctively different, based upon the degree of fertility and the corresponding yield of crops their land can produce. Soil, being easily replaceable from freshly excavated building sites and elsewhere is generally considered by them to be a trivial matter. The scientific perspective in this regard is however strategically different based on a long-term vision moulded by preservation and sustainability principles to ensure optimal land-use.

2. WHAT HAS BEEN DONE SO FAR

Agricultural land conservation is a multi facet concept that has arisen of the need to suppress the consistent deterioration of agricultural land. From a local perspective, its overall purposes will be to safeguard an adequate supply of agricultural land from being sterilized by alien development while maximising its potential in terms of food production.

Locally, a number of past attempts made using the United States Department of Agriculture System (USDAS) have been of limited success. This is primarily attributed to differences arising from geo-climatic factors (including topography) prevailing in that region, obviously being different from those acting within the Mediterranean region. The suitability of a working model must therefore be judged by how well it meets the objectives dictated by local conditions.

While ideally it is intended that such a classification system will assist both planners and decision takers in dealing with Development Applications in Outside Development Zones (ODZ), it should also be found useful to others who, to save precious time opt to undertake land evaluation surveys themselves prior to entering into any expensive development commitments.

Used in this wider sense, a system of land classification would facilitate rapid evaluation of agricultural land once a set of criteria has been formally established. The criteria that was subsequently developed in this package is the result of extensive literature review on the subject, as well as local field trials in Malta and Gozo. Consultations with a number of key government and non-government organizations has been ongoing since the initial stages of this project. This work commenced in 1998 as a joint effort between officials from the Forward Planning Unit of the Planning Authority and the Land & Water Resources Section within the Department of Agriculture. Other substantial contributors from the Geography Department at the University of Malta and a number of participating members of the Soil Erosion/Desertification Control Team (Malta) are hereby also being acknowledged for their contributions.

3. AIMS

The main aim of this work was to standardize procedures of approach between the Department of Agriculture and the Planning Authority when evaluating agricultural land. It was envisaged that once such a system is in place and officially recognized, both entities should benefit from its implementation as a planning tool to resolve existing and future conflicts arising from a steadily increasing demand to develop agricultural land. The ultimate goal of the working group was therefore to produce a credible Land Capability and Classification System based on a set of selective criteria acceptable to both institutions to facilitate procedures in carrying out their own official tasks.

In designating Areas of Agricultural Value, it is primarily intended to compliment existing policies, and to provide an effective instrument of protection with a wider sphere of influence over arising conflicts in Local Plans. The concept is amply treated in the current Structure Plan Policies dealing with Agriculture, namely: AHF 3, AHF 5 paragraph 1, RCO 1 paragraph 1, RCO 3 paragraph 1, and specifically in RCO 7, whereby the primary role of the Planning Authority was (still is) to provide for the needs of designated Areas of Agricultural Value and ensure ***"their importance in the resolution of conflicts with other rural interests"***

Agricultural land conservation is a multi facet concept that has arisen of the need to suppress the consistent deterioration of agricultural land. In the Maltese Islands, its overall purposes is to safeguard and protect an adequate supply of agricultural land from being sterilized by alien development while maximising it's potential in terms of food production.

PART B

4. ADVICE TO ASSESSOR ON ASSESSMENT PROCEDURE

How to use the LC&C Form

This document comprises a complete package for the assessment of agricultural land in the Maltese Islands It and consists of:

- Advice for assessors (page to);
- List of criteria according to their hierarchical importance and working definition (page to);
- Capability and classification collation form (page to);
- Score range and code symbols to capability classification (page to);

Although the assessment procedure may appear difficult to pursue initially, the underlying structure is simple and easy to follow. It will take only little practice to be able to carry out land assessments quickly and accurately.

In order to ensure proper evaluation it is recommended that two assessors should initially undertake the survey independently. Once complete, both assessors should compare the resulting scoring attributed individually and where differences exist, jointly review to reconcile a final assessment on a new assessment form. Moreover, it is further recommended that both pre-assessment forms and any data relative to the land under consideration should be attached to the final assessment document. The following procedure is recommended:

1. **In order to conduct an assessment, each assessor must first fill up the *No Score Characteristics* section that primarily serves as complimentary reference data relative to the site. For completeness sake it is also recommended that a site plan of the respective area indicating clearly the site's boundary be attached.**
2. **Assessors should be familiar with the list of selected criteria in the 1st right-hand column and the corresponding level of importance in 2nd right-hand column of the collation sheet.**
3. **To note the weighting value allocated for each category in rows 3 to 7.**
4. **To note the Score Range Table (page 2), indicating the maximum and minimum values allotted for each criteria and their corresponding code as a final reference to the Land Capability Equation.**

Code Format for mapping purposes.

Site evaluation proceeds by having regarded the list of criteria in order to guide assessment of the specific features that were selected for their importance in

Maltese agriculture. Each criterion in the capability code refers to a particular feature, which is represented by a symbol (letter or a number refer to p. 2 of the collation sheet). Every symbol falls within a definite score range with a maximum and a minimum score value.

A condensed format of all the soil/land features that are recorded during an assessment exercise may be represented by a capability code henceforth referred to as the Capability Classification Equation as shown in figure U below. The equation provides for an effective way of transferring a great deal of information in a very condensed form directly on to a survey sheet or even an aerial photograph.

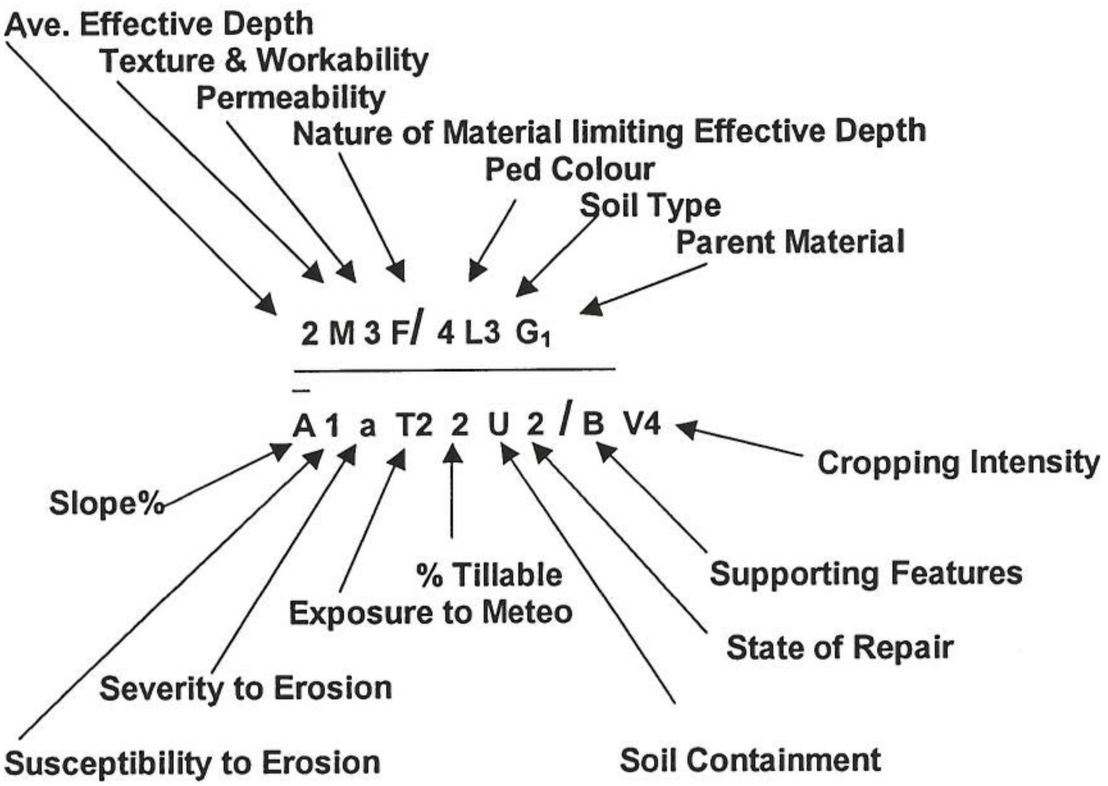


Figure U. Standard Agricultural Land Capability Code for the Maltese Islands

Decoding an equation and interpretation.

The above equation example describes a typical agricultural tenement. Top left of the oblique displays the soil factors and below those partaking the land. The top right side of the oblique displays the non-score attributes and information that does not affect the overall capability of the land and below the activity's inputs. The above example equation may therefore be summarised as follows:

"An agricultural land with a soil depth of average depth between 95 and 71cms, of a loamy constituency predominantly sandy and a rather high permeability underlined by a substrata of globigerina limestone which limits the effective working depth (plough zone). The land is consistently almost level throughout with insignificant soil losses partly due also to the state of boundary walls that prevent erosion. The land is exposed only to mild meteorological intensity due to its location within a system of protective land features. The land has a reserve water capacity enough to last at least 90 days. The intensity of agricultural activity is high input/ high output"

Standardisation of Field Techniques

In collecting the relevant field data standard procedures must be employed to ensure uniformity. These procedures are briefly described below.

Average Effective Depth: This is a column of soil which may consists of one or more horizons and can be measured by a calibrated soil penetrometer graduated in kg / cm^2. The instrument should be pre-set to 'stall' when the applied hand pressure reaches YY Kg / cm ^{2} which is to be taken as an impenetrable layer beyond which no root development can occur.

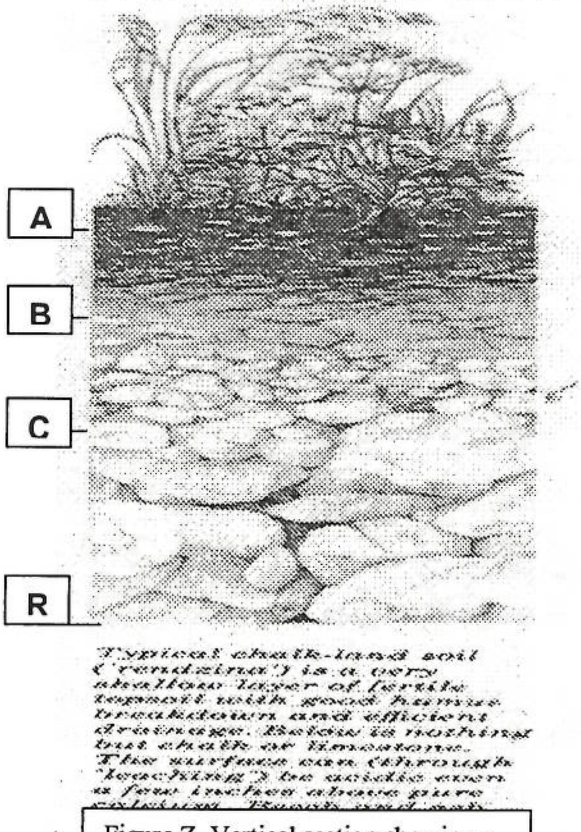


Figure Z. Vertical section showing a number of distinct layers known as horizons.

This is normally the transition layer between the soil and solid bed rock or the R horizon (Refer figure Z below). The measured depth is recorded and taken to be the maximum at that precise sampling point when taken from a vertical direction across a field. At least three sampling points should be measured and an average drawn and recorded. In pedological terms this layer is known as the (A) horizon, one of several which locally due to shallowness of most soils may be difficult to detect or even being absent altogether in cases were interventions such as soil addition and mixing have been carried out.

Texture & Workability: Texture is a mechanical property that varies extensively from one soil type to another being mainly dependent mainly on mineral constituency, humidity and to an extent colloidal matter.

Soil textural classes are determined by the percentage limits set out by the texture chart in figure T below for the amount sand, silt and clay in a soil sample. It features an important aspect concerning the plough zone layer, which, to farmers in particular, determines the extent of effort needed (ease) to cultivate the land. In pedological terms this layer is known as the (A) horizon, one of several which locally due to shallowness of most soils may be difficult to detect or even being absent altogether in cases were interventions such as soil addition and mixing have been carried out. This work will consider an adapted version of the International Standard (Figure T) as a means of grading particle size of local soils.

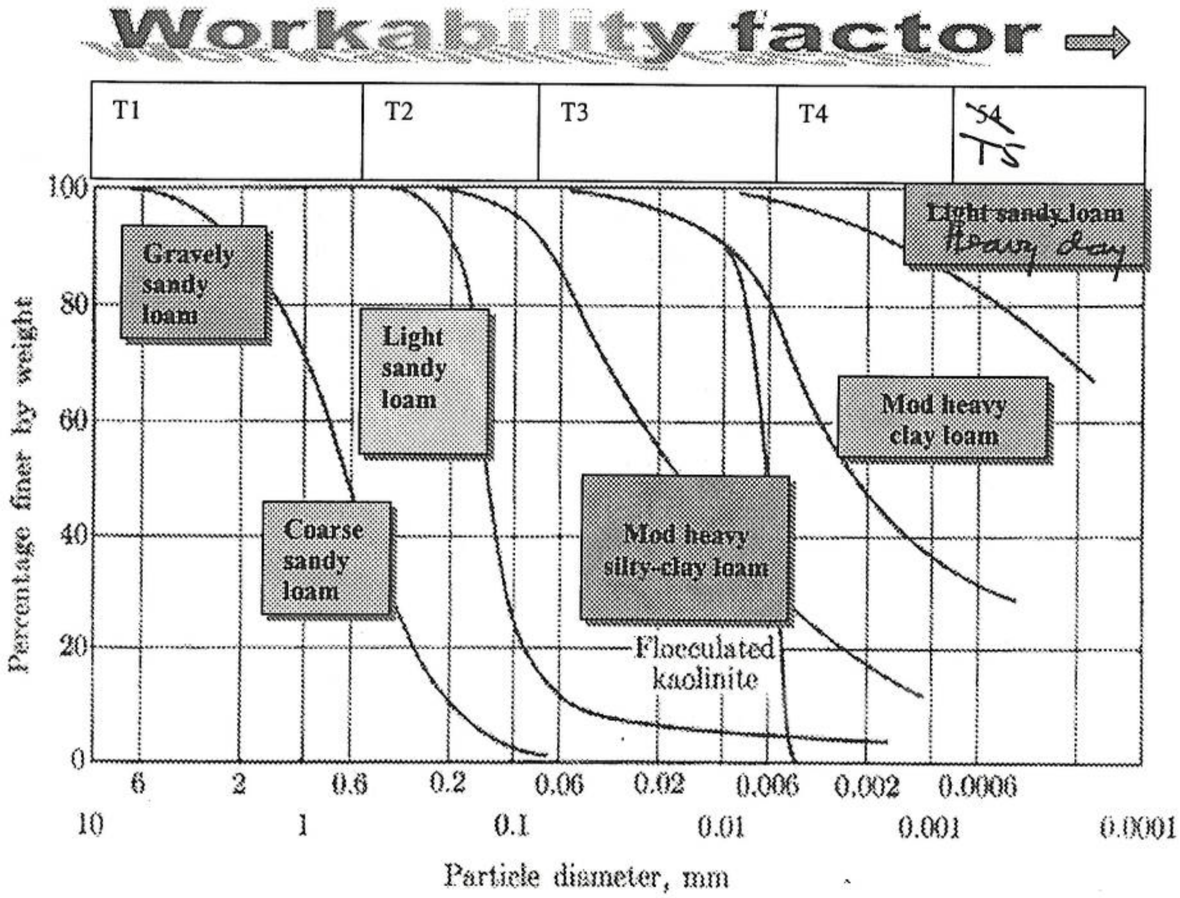


Figure T. Typical grain distribution curves for various soils (Modified)

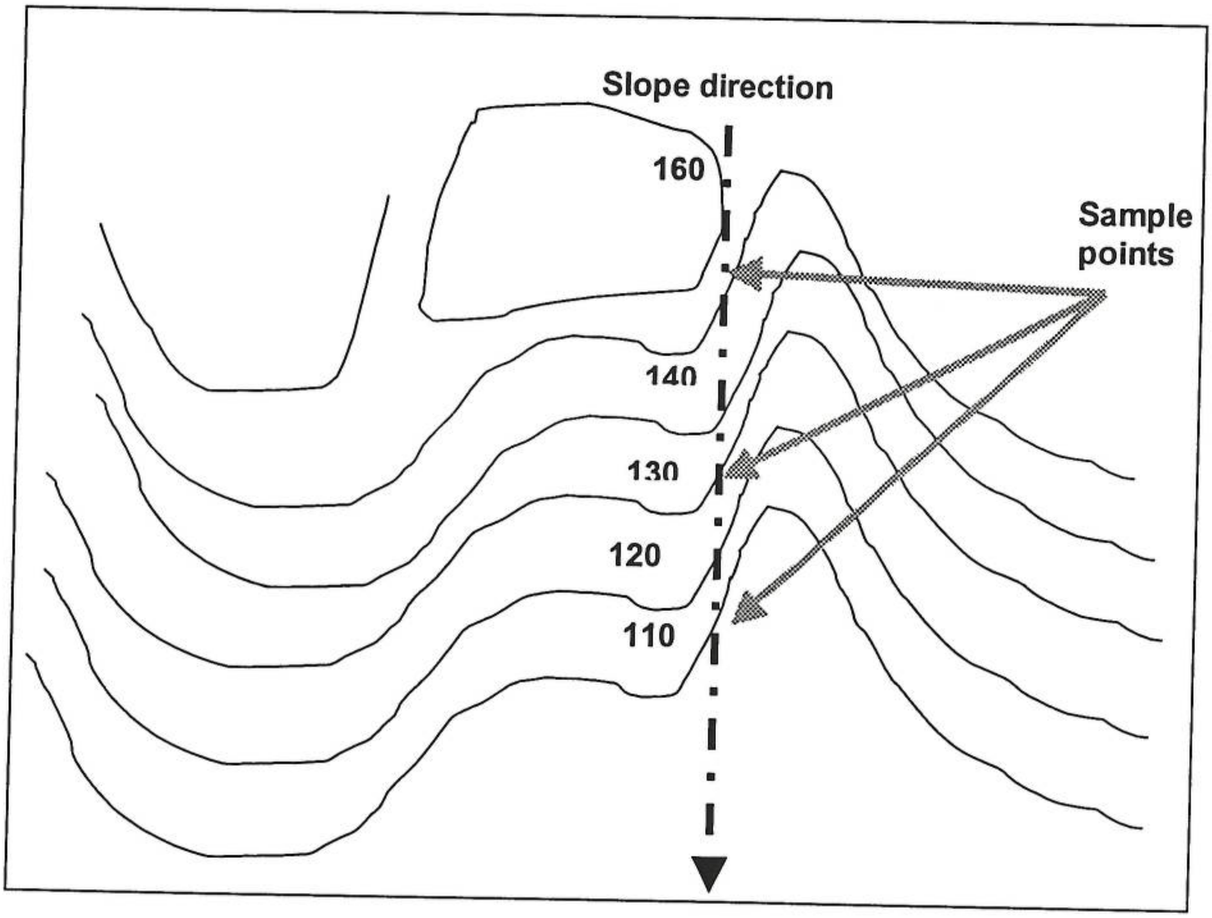
The texture test procedure should be carried out on soil samples retrieved from the top most 15 cms of soil. A crude but a fast technique requires that a minute quantity of a well-mixed sample of soil be moistened to its plasticity limit while working it into a ball between fingers. The characteristic feel that develops is easily distinguishable as being sandy, clayey or loamy. More complex soils however will require sieve analysis that should be carried out in a laboratory.

Permeability

Permeability is the rate of flow through unit cross-section of a soil column in unit time when acted upon by a constant hydraulic gradient. The assortment and variable sizes of minerals and colloidal particles affect not just the passage of water (drainage) but also aeration, water holding capacity, capillarity, habitable space for microorganisms and many others. Locally, soils depths are relatively shallow compared with others in other countries and mainly occur with one and less frequently two distinctive horizons. In this respect significant change in permeability as one move deeper is very unlikely. Permeability test are best carried out within the plough zone layer (25 cms from top soil level).

Percentage Slope

Slope angle of a field is the mean average of inclination between two fixed points of an imaginary line at right angles across the land contour lines as shown in figure M below (GIS. Vertical Mapper II)



Susceptibility to Erosion

This is a predictive and to an extent an equally subjective aspect. In the course of assessing this feature the predictive part entails identification and analysis of all the visible parameters such as topography (slopes), soil type, vegetation cover, and land use management being practised, all of which have direct influence on soil stability. Subjectivity can only be reduced but not eliminated. Provided that different assessors follow the same systematic approach proposed in Box ZZ below the subjectivity element should be reduced significantly.

<u>Soil Containment</u>

Refers to man made interventions to combat all forms of soil erosion. A number of materials are in use however, usually restricted to those which are available on site. Most valued, but not so readily available to day is weathered rubble limestone. Plate D below shows clearly that no boundary wall is safe in abnormal weather conditions even when adequate water drainage exists. Other means to prevent soil erosion such as quarried globigerina blocks, reed/Opuntia hedges, and oil drums offer some protection but are unreliable even under mild storm conditions. Definitions of containment and types as found locally on site are given below.

1. *Rubble: Refers to a wall constructed of loose, roughly cut/hewn or old weathered limestone of variable size and weight (Ref to plate F below). Rubble walls are excellent in conducting rainwater unhindered thereby preventing field flooding.*
2. *Depression: A parcel or a number of adjoining ones having their cross-sectional spot levels (including boundary) shallower than those surrounding, (example: old shallow quarry).*

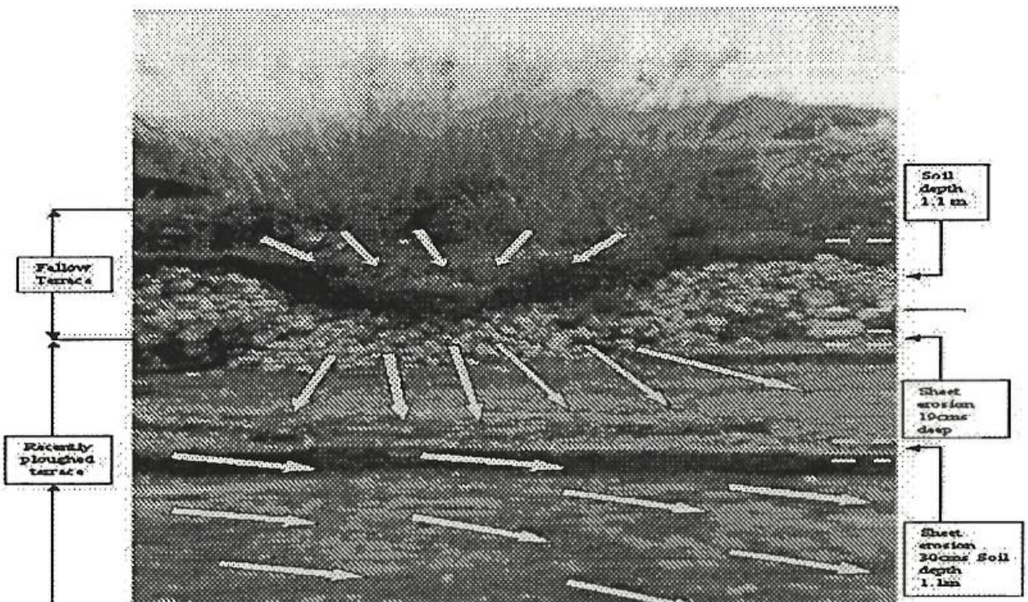


Plate I. Erosion at work. Lack of maintenance of boundary walls is one of the main reasons for soil losses.

3. *Blocks: Standard globigerina quarry block.* (Ashlar wall)
4. *Other: Any rudimentary material of any form or size used to delineate a site and which could provide some form of soil protection to minimise erosion.*
5. *None*

State of Repair

The state of boundary walls is a good indication that good farming practices are being carried out. This feature is complementary and a subsidiary factor to the previous criteria. In essence it is essential that all breaches in boundary walls should be recorded and measured. Attention should be made to the significance of a breach/s when recording the overall state of boundary walls. For instance, extensive breaching above a field's soil level (a.s.l) is of a lesser concern when compared to others existing below soil level (b.s.l).

1. *None: No breaches, highly maintained.*
2. *Slight above soil level: Not more than six breaches each of a length not exceeding one meter per 100 meters of boundary wall.*
3. *Slightly below or at soil level: Not more than two breaches each of a length not exceeding one meter per 100 meters of boundary wall.*
4. *Partially below or at soil level: Not less than two breaches but not more than six each of a length not exceeding one meter per 100 meters of boundary wall.*
5. *Multiple below soil or at soil level: More than six breaches of a length not exceeding one meter per 100 meters of boundary wall.*

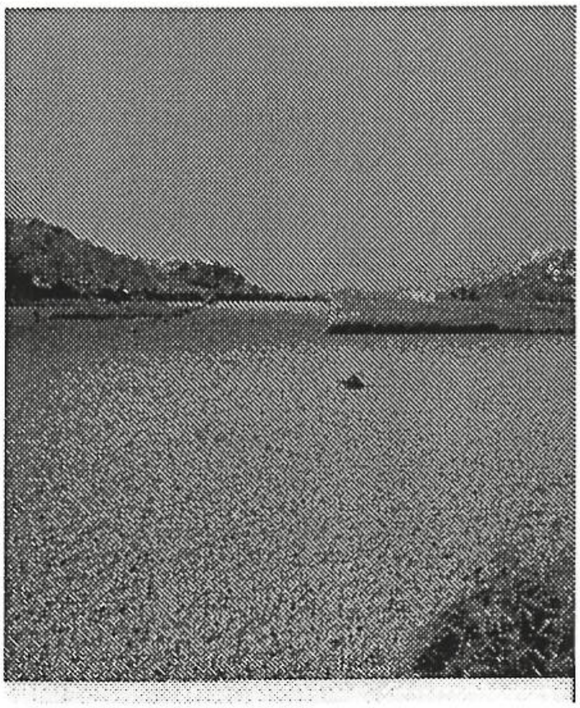


Plate S. Almost flat ground. Field at Xewkija Gozo without boundary walls with no significant signs of soil erosion

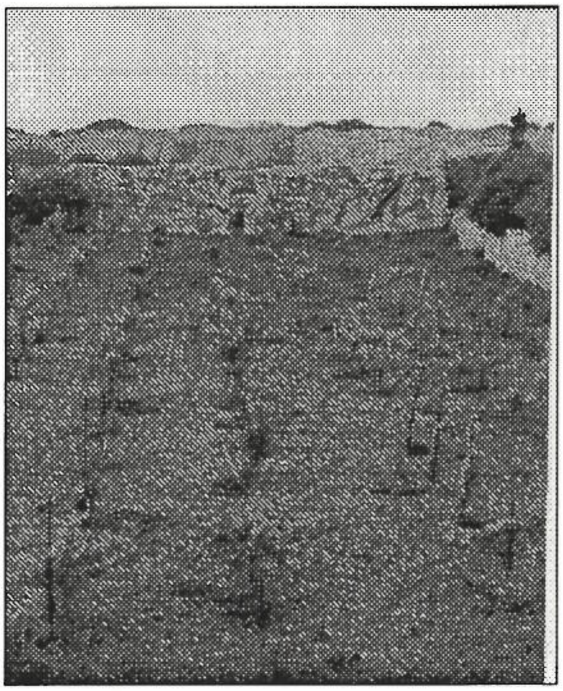


Plate M. A reclaimed quarry at tal-Ballab typical example of 'Zero' erosion but may be subject to prolonged padding

Severity of Erosion

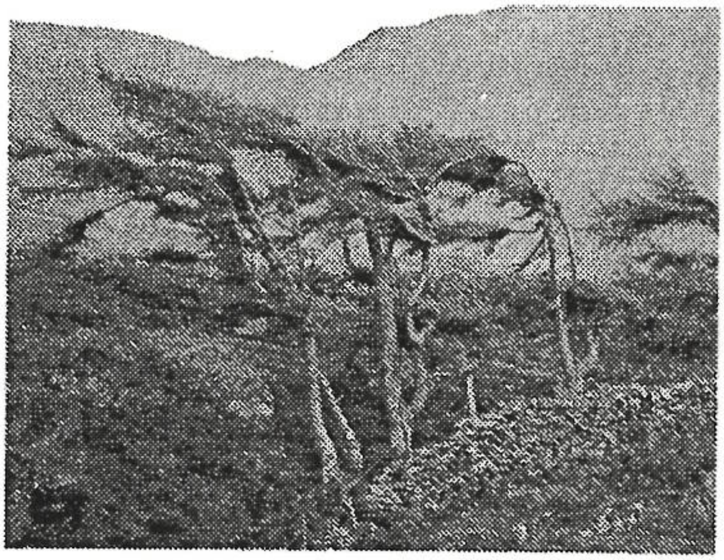
Exposure to Meteorological Intensity

The Maltese Islands are characteristically windy, having only some 13 percent of the days in a year which are relatively calm. The Northwesterly is prevalent, blowing some 18 percent of the windy days in a year. Other winds are nearly equally represented. From an agricultural point of view the main meteorological factors of wind that are of particular significance to agricultural crops are listed and described below:

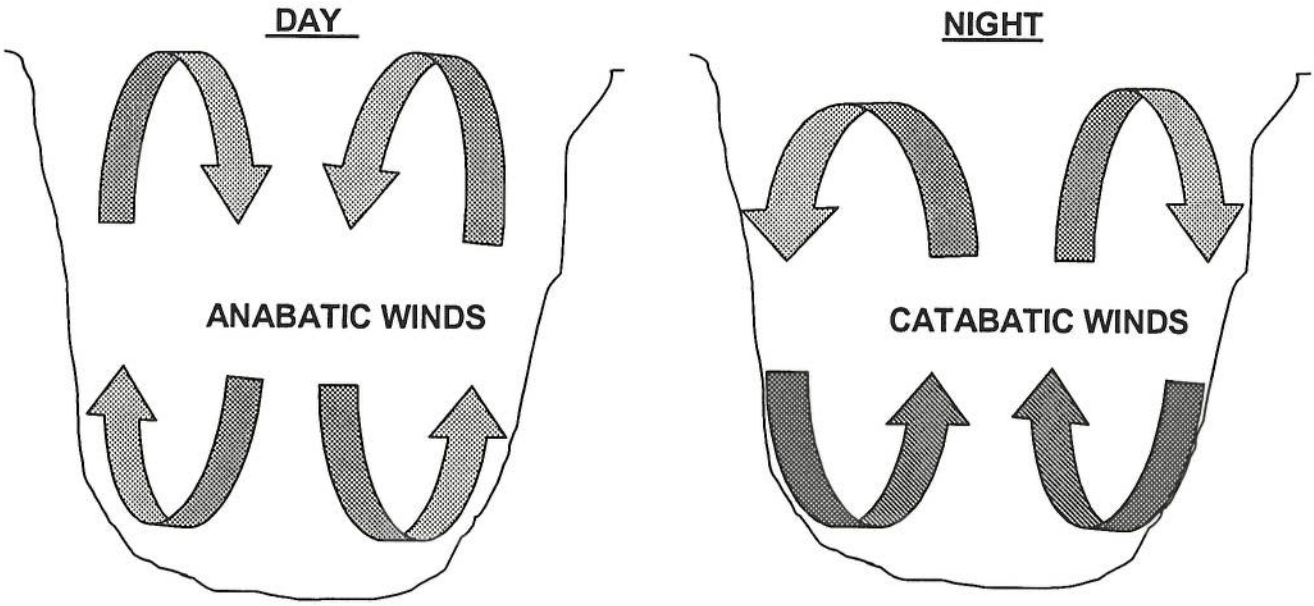
- **Direction**
- **Velocity and impact of airborne particles**
- **Relative humidity/temperature**

Direction: The coldest wind that causes severe damage to crops particularly in exposed coastal agricultural areas is the North-easterly (Grigal), blowing across the islands from a general southward direction from continental Europe. Of equally concern is the North-westerly (Maistral), dreaded by local farmers as it also leaves undesirable marked effect on crops. The other two winds namely the South-easterly (Xlokk), and the South-westerly (Bec), are relatively milder in intensity and warmer.

A prevailing wind can deform trees by preventing them shooting on the windward side. New shoots can grow only in the shelter of old ones; the tree trails over to leeward.



Relative humidity/temperature: When exposed to frequent drying winds, most crops fail to reach the desirable size and morphological aspects that are normally attained under milder or sheltered conditions. On the other side of the scale, the cooling effect of wind also contributes to dwarfism by retarding cell growth rates, desiccation of tender parts of a crop such as buds and foliage. Some of the effects of wind on plant morphology are sometime more due to air borne particulates rather than the wind itself. Salt laden winds blowing in land for a long period for instance, are likely to be devastating to crops due to salt toxicity and the physical abrasion caused by the wind driven particles themselves.



Cross-sectional views of Anabatic and Catabatic wind movement in a valley system

Velocity and impact of air borne particles: The physical impact of wind at high velocity on vegetation and any microscopic particles of air borne sea salt along exposed coastal areas have a physiological and a morphological effect on vegetation. This is evident from the narrow strip of land colonised by a distinctive type of vegetation that differs in both form and species composition from that found inland. Most agricultural crops are similarly sensitive to salt concentrations in air as much as in the soil. Its concentration in the air and its eventual deposition on crops or on soil merits significant consideration particularly when considering the suitability of a site to produce market gardening crops such as potatoes, tomatoes.

Accessibility

It is generally accepted that access to fields should be adequate enough to permit unhindered access and manoeuvrability to four-wheel drive machinery and other related agricultural equipment.

1. Dual carriageway (with a mean uninterrupted width not less than 5.2 meters measured at ground level), made-up, hot asphalt/hard-stone ground.

2. Dual carriageway (with a mean uninterrupted width not less than 5.2 meters measured at ground level), made-up surface with gravel fill material, with frequent potholes, hard enough to support heavy machinery even under wettest conditions.

3. Single carriageway (with a mean and uninterrupted width not less than 2.3 meters measured at ground level), made-up surface with gravel fill material, with occasional potholes, but hard enough to support heavy machinery even under wettest conditions.

4. Single carriageway (with a mean and uninterrupted width less than 2.2 meters measured at ground level), made-up surface with gravel/soil fill material, with frequent potholes, awkward and winding to manoeuvre, protruding boundary walls, surface not hard enough to support heavy machinery even under mild wet conditions.

5. Foot path, less then 2 meters wide, hard trodden soil surface, exposed hardpan at intervals or solid base rock, hydraulically eroded, bumpy, obstructed by side verges and possibly trees, access may be interrupted in places by collapsed boundary wall material.

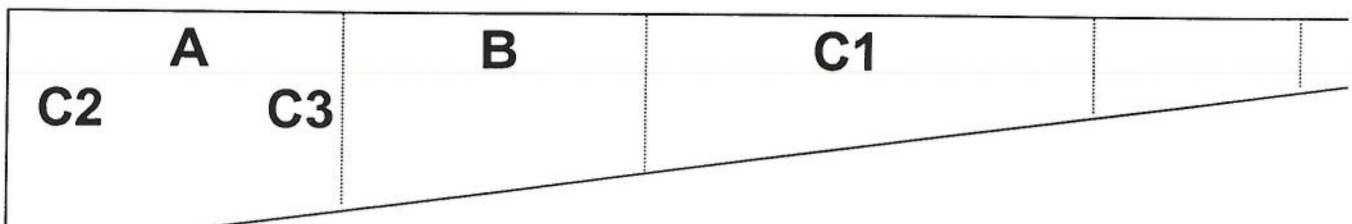
Supporting Features

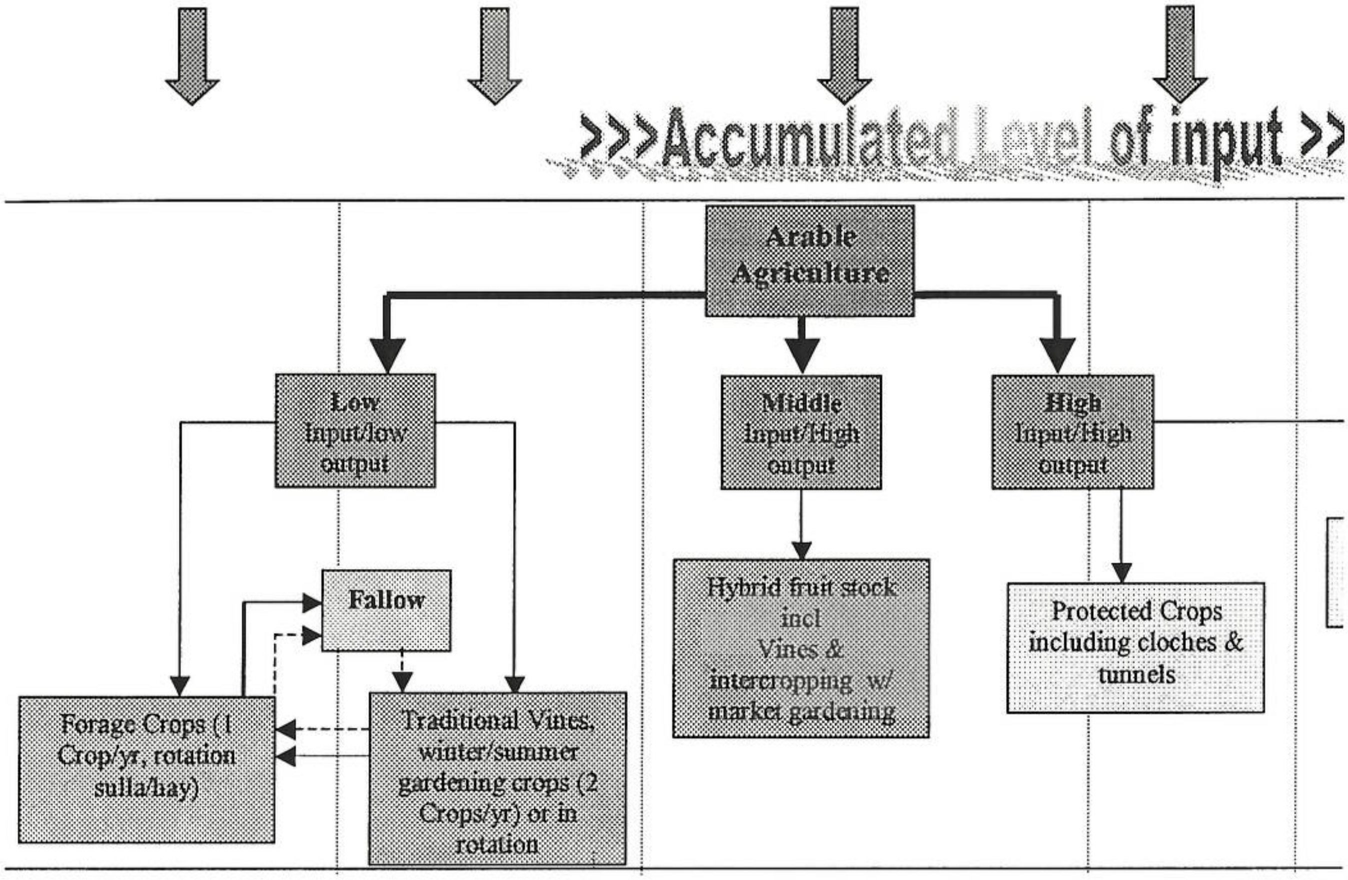
Any agricultural land that is complemented by a reliable source of irrigation water whether supplied naturally by springs or artificially through boreholes appreciates in monetary value. The presence of an uninterrupted year-round irrigation source gives scope and opportunity for farmers to boost production and maximise profits. Table F below may be used as a guide to assessment.

Natural spring/Bore holes supply minimum	Reservoir cap. c 90 days	Reservoir cap. c 60 days	Reservoir cap. c.30 days	Rain fed
Uninterrupted flow	To supply minimum 1500m^3/Ha or 170 m^3/tumolo	To supply minimum 1500m^3/Ha or 170 m^3/tumolo	To supply minimum 1500m^3/Ha or 170 m^3/tumolo	Do

Cropping Intensity

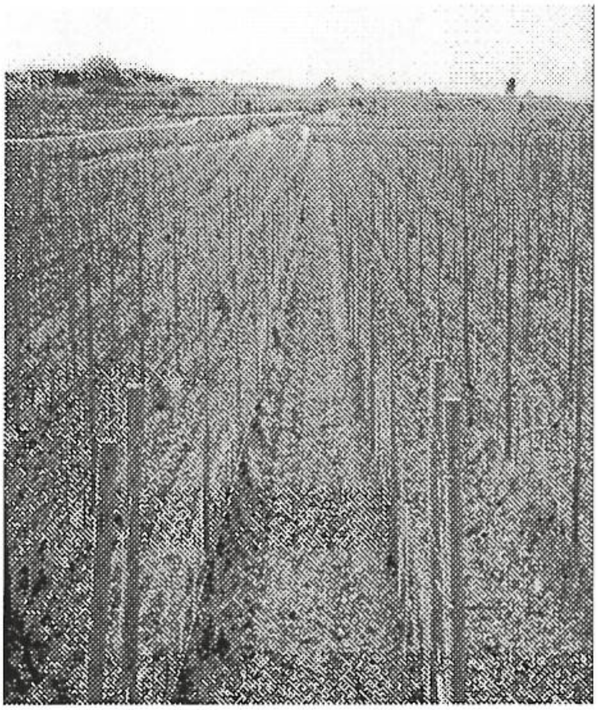
With the exclusion of unrelated land uses, the agricultural value of any land under cultivation may be assessed by the degree of commitment being made (input level). For ease of reference the different levels of inputs normally encountered locally are diagrammatically represented by figure E below.

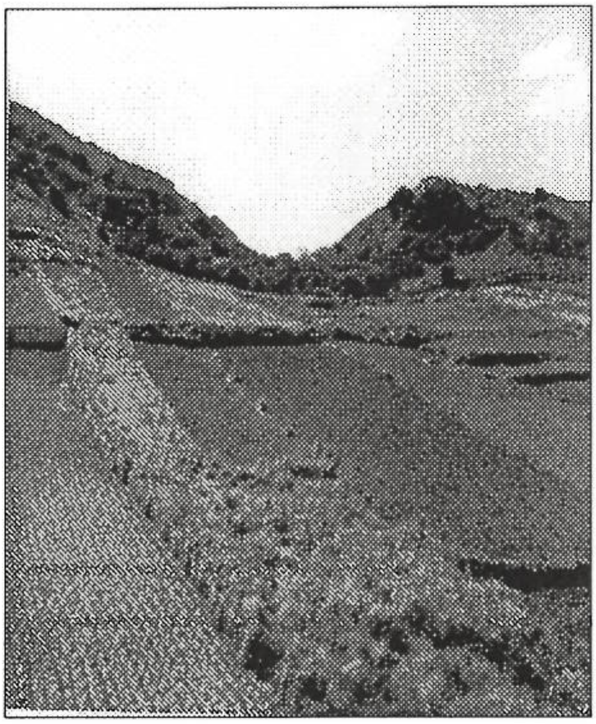




Evaluation of inputs/outputs requires a through visual inspection of the site to enable proper assessment of the status. Assessors should look for:

1. Dry cultivation:
   Crop type – broad beans, tomatoes, w. melons corgets evident enough in winter and spring not so in late summer. Stubble remaining after harvesting should however be a reliable indicator. Crops are normally grown on a rotational basis to maintain fertility.
2.





Class	Designation	General Description	Indicators
1	Very Good	In irrigated Areas, such soils when properly managed could sustain a constant rotation of crops with only a short resting period between cropping. A wide range of market garden vegetables and fruits could be grown all year round. Equivalent areas under dry cultivation are usually underused is due lack of available water and not to a lesser soil fertility. Vehicular access to the site must be adequate to allow agricultural machinery to maneuver through without difficulty all year	

		round. *Prolonged periods of dry, mono cultivation practices could affect the fertility capability of the land indirectly due to soil exposure to wind/ water erosion, resulting also in macro nutrients depletion. The capability of such areas will further deteriorate if the stewardship of the land and agricultural practices are inadequate.* The risk of soil erosion due to heavy rainfall is minimal as the land will normally be either level or have less than a 3 per cent slope however, isolated spots of rill erosion may be observed. The site may or may not always be completely secures by well maintained boundary walls. In cases where the overall soil level of the field is well below that of adjacent plots or road level should be considered as being unaffected by water erosion (eg.: reclaimed quarries). Prime sites are usually but not necessarily always surrounded by raised ground and topographic features that offer protection from direct north-westerly winds and are not adversely affected by saline spray conditions. Soil depth can vary extensively, however sites having 70 cms or more of soil should be considered as prime candidates for this category. In instances where the entire soil column has been made-up artificially through man's intervention (consisting of a homogeneous mixture as in cases were land has been reclaimed or voids filled with imported material), should be considered as man-made equivalents. Subsoil material having a different nstituency and texture may be present on casions. It is normally located as a distinct er below the top most 30 cms of the soil umn. Subsoil particle size and frequency reases with depth and this affects positively l aeration, drainage and water holding pacity. No exposed bare rock should be evident	

		however topsoil cover may contain patches of gravel and rock fragments which on average should rarely exceeds 2 cms in equivalent diameter.	
2	Good	Soils will be similar to those described for Class1 with a slope of over 3% but rarely greater than 7%. Some sites may have surface depressions caused by accumulation of rain water causing soil to settle and compact. Salinization and surface deposit may be evident in pocket areas. The land is subject to mild erosion but may not be easily to detect if adequate tillage practices such as contour cultivation and alternate strip cropping are being practiced. Such soils may also be subject to occasional flooding resulting in temporary water logging due to an insufficient rate. Excessive build-up of water pressure occurs when the natural drainage of the soil is insufficient. This is further evident by collapsed boundary walls and the resulting considerable soil losses immediately behind the exposed zones. Erosion could be kept under control by applying adequate field practices to maintain slope stabilization, e.g.: adoption of contour plowing methods and delayed vegetation coverage techniques or retention of crop stubble. An additional measure to stabilize slopes is to plant fruit trees or incorporate viticulture strips in parallel and at right angle to the field slope. Access to fields should generally be good and just as adequate as in Class1. There may be instances however, where under excessively wet conditions, movement of vehicles will be restricted or even made impossible due to an unconsolidated surfacing.	
3	Marginally good	Typical of slope cultivation whereby long strips of agricultural land follows the natural undulations of the sloping terrain. Such areas exists on valley sides and coastal areas. Cultivated strips are frequently subdivided	

		into smaller size pots varying from $500m^2$ (half a Tumoli) to $3000m^2$ **(over two and a half Tumoli).** Soil depth will also vary across the width of fields, the deepest end of which is nearly always located at the outer periphery of the terrace. Measurements of soil depth should be taken in a manner which gives a reasonable picture of the soil column profile, taking a minimum of 3 depth readings preferably diagonally across the site. Soil erosion is not always evident, however the land is highly susceptible to soil losses due to boundary wall failure during heavy storms. Access may either be served by a reasonably wide 'servitu' (right of ways which may also be shared by others), or may traverse directly through a number of individual holdings. Access surface may be concreted over or highly consolidated through wheel compaction (builder's sand gravel may also be evident). Under extremely wet conditions surface breakdown is likely and access may not be always possible.	
4	Poor	Soils are normally very shallow, having less than 15 cms of soil. Such areas are normally associated with extensive rocky outcrops of Globigerina or Upper/ Lower Coralline. Where stony and bouldery conditions prevail plough-zones are inconsistent due to shallowness often causing undue wear and tear of equipment. Agricultural practices are minimal and restricted to dry cultivation raising sulla hay or wheat. Rocky areas may support an array of communities such as carob, prickly, pear, figs and a number of opportunistic species. Land may also lay fallow for a number of years or be outright abandoned. Abandonment proper is usually indicated by estate neglect which induces illegal dumping and destruction of boundary walls.	*Shallow soil;* *Established perennials such as:* *Exposure of underlying bed-rock through sheet and gully erosion;* *Boundary walls in a bad state of repair;* *Bird tapping hides;* *Dumping of building construction material and/ or scraped vehicles.*

Glossary

Abandoned land
Agricultural land which has not been cultivated for more than 24 consecutive months

Boundary
The peripheral limits that physically confines agricultural land.

Component
An identifiable unit within a system

Conservation
An action to protect

Fallow
Agricultural land which is deliberately left in an unused state for a specific period of time (Time established 24 consecutive months).

Fodder Crops
Dry land agricultural crops harvested mainly for cattle consumption

Hybrid stock
the first generation offspring of a cross between two different individuals differing in one or more genes.

Intensive system
Systems capable of producing more crops and higher yields per unit area of land.

Intercropping
to grow a number of crops on the same land simultaneously.

Criteria
A criterion is a specific feature considered to be of paramount importance. Twelve have been short-listed to be used when evaluating agricultural land.

Level of Importance
The degree of importance (rank) attributed to each of the twelve criterions.
Weight Factor
Is a quantitative
Score value
A numerical expression allotted by an assessor when assessing a feature. It is the product of the **Level of Importance** component and the **Weight Factor** component as further indicated in the Collation Sheet.
Monocropping/Monoculture
Repeated cultivation of one particular crop species.
Productivity
A measure of efficiency, relating output of product to the use of a resource.
Rotation
Growing different crops in a cyclic sequence to maintain soil fertility.
Stubble
The part of a crop left above soil level after harvesting.
Yield
Quantity of agricultural goods produced per unit crop, per unit area in unit time.

AGRICULTURAL LAND CAPABILITY & CLASSIFICATION COLLATION SHEET

Baseline Data	Soil Data	Date of Survey		Surveyor/s
Parent Material		Local Plan Area		Dep of Agri Track Ref
Soil Type *(Kubiena)*		S.S. No:	Yr of S.S.	Designated Class Order
Soil Series *(Lang)*				
Ped Colour *(Munsell)*		O.P. Strip No:		

Site Evaluation

Criteria	Level of Importance	Weight factor 10	7.5	5	2.5	1	Score Value	Capability Code	Soil Code
Average Effective Depth	12	<70	<40 >69	>39 <25	>24 <15	> 15	12		
Texture & Workability	12	Mod light sandy clay loam	Mod heavy silty clay loam	Light sandy loam	Mod heavy clay loam	Heavy clay loam			
Permeability *(Top Soil)*	10	Mod permeable	Rapid	Very rapid	Restricted permeability	Almost Impermeable			
Percentage Slope	12	<3	<3 >7	<8 >12	<13 >18	>18			
Percentage Tillable	11	100	<70 >90	<50 >70	<50 >25	<25			
Suseptibility to Erosion	11	Very remote	Unlikely	Neglible	Very likely	Permanent features			
Severity of Erosion	13	Insignifcant	Low	Moderate	High	Very High			
Soil Containment	10	Rubble	Depression	Blocks	Other	None			
State of Repair (Breaches)	9	None	Slight a.s.l	Slight b.s.l	Partialy b.s.l	Multiple b.s.l			
Exposure to Meteorological Intensity	6	Secluded	Level 1	Level 2	Level 3	Level 4			
Accessibility	9	Good	Fair	Difficult	Light machinery only	Footpath only			
Percentage Tillable	8	< 95	<85 >94	<75 >84	<55 >74	> 55			
Supporting features *(Natural /Man-made)*	9	Uninterrupted natural spring	Bore holes	90 day water reserv *(min)*	60 day water reserv *(min)*	Rain fed			
Cropping Intensity	11	Level 1	Level 2	Level 3	Level 4	Level 5			

REFERENCE TO CODE SYMBOLS & CORRESPONDING SCORE RANGE

ITEM	CODES & CORESSPONDING SCORE VALUES					Score	Code
Average effective depth	1 96 - 120	2 71 - 95	3 46 - 70	4 45 - 69	5 <44	12	5.
Texture & Workability	T1 96 - 120	T2 71 - 95	T3 46 - 70	T4 45 - 69	T5 >44		T3
Permeability	5 80 - 100	4 59 - 79	3 38 - 58	2 17 - 37	1 >16		
Percentage Slope	A 96-120	B 71 - 95	C 46 - 70	D 45 - 69	E >44		
Suseptibility to Erosion	1 88 -110	2 65 - 87	3 42 - 64	4 41 -19	5 >18		
Severity of Erosion	a 104 - 130	b 77 - 103	c 50 - 76	d 23 - 49	e >22		
Soil Containment Mech	U 80 - 100	V 59 - 79	W 38 - 58	Y 17 - 37	F >16		
State of Repair (Breaches)	0 72 - 90	1 53 - 71	2 34 - 52	3 15 - 32	4 >14		
Exposure to Meterological intensity	t1 48 - 60	t2 35 - 47	t3 22 - 34	t4 6 - 21	t5 >5		
Accessibility	G 72 - 90	D 53 - 71	C 34 - 52	B 15 - 32	A >14		
Percentage Tillable	1 100	2 75 - 90	3 50 - 70	4 50 - 25	5 >25		
Supporting Features	A 72 - 90	B 53 - 71	C1 34 - 52	C2 15 - 32	C3 >14		
Cropping Intensity	v1 88 - 110	v2 65 - 87	v3 42 - 64	v4 41 - 19	v5 >18		