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Sustainable Management of Agricultural Resources: A Model Proposal For Agricultural Management Planning

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Abstract
Agriculture has a vital role as an economic sector for the sustainable development of countries besides its necessity for the continuity of human life. On the other hand, agricultural productivity is very open to negative changes that occurs from social, economic, physical and ecological fluctuations. Given that these pre–explainations, it is necessary to manage the agricultural areas/resources via a mechanism that deals with the changing socio–cultural relations, economic conditions and ecological resources with different dynamics and dimensions. The aim of this paper is to analyze a comprehensive management principles of the areas where there is a vast agricultural production and the contents and preparation steps of an agricultural management plan, seen as a strategic tools for sustainable management, protection, development and usage. The first method which are used for this research is literature review about resource management planning to describe the main steps of it and variation of management areas. Later the characteristic of Kumkale Major Plain is evaluated in the scope of management area. Finally, a model for Sustainable Management of Agricultural Resources which provides a coordination and collaboration between stakeholders and describes the action plan focused on the sustainable management of agricultural resources to the future politics, actions with the responsible foundations is proposed for this kind of managable agricultural areas. In this framework, the Sustainable Management Model for Agricultural Resources (SMAR) is handled under 3 (three) sub-model process management model as authority-responsibility based managemetn model, participation model, planning–implementation model.

Keywords: Kumkale major plain, management planning, management plan, sustainable agriculture.

Tarımsal Kaynakların Sürdürülebilir Yönetimi: Yönetim Planlaması İçin Bir Model Önerisi

Öz
Tarımsal faaliyetlerin insan yaşamının devamlılığındaki öneminin yanı sıra ülkelerin sürdürülebilir kalkınmaya yönelik arayışlarında da ekonomik bir sektör olarak önemli bir yere sahip olduğu söylenebilir. Öte yandan bu sektör sosyal, ekonomik, fiziksel ve ekolojik dalgalanmalardan olumsuz etkilenebilmektedir. Bu ön açıklamalar göze alınırsa, tarımsal alanların/kaynakların sosyo-ekonomik ve ekolojik çevreyi bir süreç bütününde değerlendiren bir yönetim mekanizması ile idaresi önemli bir gereksinim olarak ortaya çıkmaktadır. Bu çalışmanın amacı, yüksek tarımsal üretim kapasitesinin bulunduğu alanlara ilişkin kapsamlı yönetim ilkelerinin, yönetim konularının ve doğal ve kültürel kaynakların sürdürülebilir yönetim,koruma, geliştirme ve kullanım için stratejik bir araç olarak görülen yönetim planının hazırlık aşamasının tanımlanmasıdır.Çalışmanın yöntem açıklamaları, yönetim planlamasının ana adımlarını ve yönetim alanı tiplerinin tanımlanmasına yönelik literatür araştırması, materyal alan olarak seçilen Kumkale Büyük Ovasının üretim karakteristiği ve potansiyelinin değerlendirimi ve bu alanın geleceğine ilişkin yönetim stratejileri,politikaları ve eylemlerin yetkili-sorumlu kurum-kuruluşlar arasında koordinasyon/eşgüdüm eşliğinde tanımlanması biçiminde ifade edilebilir. Sürdürülebilir tarımsal kaynak yönetimini esas alan bu mekanizma, yetki-sorumluluk esas yönetim modeli, paydaşlararası diyalog, işbirliği esas katılım modeli ve tarımsal kaynak yönetim stratejisi esas planlama-uygulama modeli olmak üzere 3 alt modele dayandırılmıştır.

Anahtar Kelimeler: Kumkale Büyük Ovası, yönetim planlaması, yönetim planı, sürdürülebilir tarım.

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1. Introduction

Agriculture has played a significant role in civilization of humanbeing for many years and it still has multi-dimensional positive affects on both development and under-development countries (Anonymous, 2003). In addition to its crucial necessity for the providing enough nutrition/food for a global population that will amount to 9.1 billion people in 2050 and over 10 billion by the end of the century, it also contributes to sustainable development of the countries in various ways as being alternative economic activity and employment sector(UNPFA, 2011). Even more, it helps to faster growth of the countries' economy by enhancing with other sectors like industy and sustainable tourism. Therefore promoting sustainable agricultural productivity is defined as a target to reduce hunger and poverty in the Millenium Development Goals, one of the strategic document of international awareness. Eventually it is possible to sum up the multi-functions of agricultural activities as providing foods, meeting raw-material needs of the industry sector and diversify the economy of the countries for the sustainable development in economic balance by creating an employment area(Anonymous, 2003; Anonymous, 2015a).

As well as its contribution to economic side of the rural economy, it sometimes helps to preserve and support of the natural environment by interacting with the cultures. To reveal and sustain the great diversity of the interactions between humans and their environment, to protect living traditional cultures, these sites, called as cultural landscapes. As they are combined works of nature and humankind, they express a long and intimate relationship between peoples and their natural environment, reflect artistic and traditional customs and specific techniques of land use that guarantee and sustain biological diversity, considered as World Heritage by UNESCO and evaluated to be inscribed on the World Heritage List since 2000(URL3).

On the other hand, agriculture sector has its own dynamics, threatens and weaknesses. The fact that it depends on natural environmental conditions increases the risk and uncertainty of its productivity. It means that all natural element such as climate conditions, drenaje-water efficiency and soil quality, invasive species which is very open to aggrevate by ecological processes has crucial effects on it (Anonymous 2015b). Expecially global warming, soil degradation, and climate change can reduce crop yields in agriculture which can cause world's food-insecure. In addition to that, the decreasing the rate of demands man-made forces and mechanization caused some unemployment which create migration to bigger cities in rapid urbanization era. That's why rapid and uncontrolled growth has become a threaten factor for the agriculture areas, expecially located at the urban fringes(Anonymous, 2003; Li and Yi, 2014).

Moreover, given that the agricultural products' short time durability, its market compepititiveness power can be seen as low, compared with the other sectors like tourism and industry that use much more lasting resources. So the sector is very open to economic, social and ecological fluctuations and it is generally seen as low income employment areas in under-development countries that couldn't achive to use technological and modern technique (Anonymous, 2017). Consequently agricultural sources/areas needs to be managed via a mechanism that deals with the changing socio-cultural, economic and ecological environment with different dynamics and dimensions.

The aim of this paper can be explained under four (4) subjects as below;

1. To analyze a comperehensive management principles for the areas where there is a vast agricultural production,
2. To describe the contents and preparation steps of an agricultural management plan, seen as a strategic tools for sustainable management, protection, development and usage.
3. To describe Sustainable Management Model for Agricultural Resources (SMAR) which consist of three sub-model as Management Model: Authority-Responsibility, Participation Model: Stakeholder Dialogue / Collaboration, Planning–Implementation Model: Management Strategies on Agricultural Resources for example research area.
4. To develop some sustainable politics, strategies and action to conserve an example agricultural lands in context of pre-management plan.

The main purpose of developing a management model for agricultural land is expected to sustain agricultural productivity by reducing the risks both based on nature and antropogenic in the short-and-long-term. By another saying, it aims to create a decisions framework in different topics such as ensuring higher and more stable yields, sustaining livelihoods that is becoming increasingly important for farmers, assisting in climate change adaptation , increasing system resilience and, therefore, enhanced livelihoods and food security(Conant, 2010; Vallis et al., 1996; Pan et al., 2006; Woodfine ,2009; Thomas, 2008). For this purpose agricultural–aimed management planning ensures a model for preserving and enhancing productive capacity of cropland and being

prepared for climate change, upholding the integrity of watersheds for water supply, hydro-power and water conservation zones by describing short-long term politics, strategies, aims and actions together with responsible institutions, allocated time and budget in colloborative, transparent, participatory ways.

The main contribution of this paper is to explain the management planning approach, its elements, the necessary management topics of agriculture sector, and is to give information about the preparation, implementation steps of an agricultural management plan, seen as a strategic tools for sustainable management, protection, development and usage, together with autority and participation model in urban planning perspective. Therefore this research can be considered as a pre-management plan example which is created in strategical planning approach for an example agricultural protection site

2. Material and Method

2.1. Material

The main material area of this research, Kumkale Great Plain, is located inside Troia Historical National Park in Çanakkale which is a city at the North-West of Turkey, and the national park surrounded by Egean Sea at the west, Dardanelles at the north, state highway, numbered E-87 at the east and three villages, named Mahmudiye, Üvecik, Pınarbaşı at the south.

This agricultural land is also unique with its cultural history. This area was named as Troas[1] at the Antique Era and very well known as Troia Battle field, dated around B.C. 13. century and was immortalized by the oldest written text of the Western Literature by Homeros around B.C. 730-720 (Korfmann, 2001; Rose, 2002;Mannsperger, 2002).

Considering the areas' unique cultural-archaelogical and natural features, it was declared as Archeological Protection Site in 1968 and for the protection Troy Archaelogical properties with the tumuluses around it, 13.350 hectare area was declared as Troya National Historical Park by the numbered 96/8676 Decision of the Council of Ministers in 30.09.1996. In addition to this national protection statuses, considering that it fulfilled the (ii), (iii) and (iv) requirements in the cultural heritage categorie of UNESCO World Heritage List, Troy Archaelogical site was declared as World Heritage Site by 849 reference number, by UNESCO[2] .

In addition to that, due to its high cultivation productivity, 7.495 hectare irrigable agricultural area has been declared as Kumkale Great Plain by the numbered 9620 Decision of the Council of Ministers in 21.01.2017(Figure 1). This legal status can be described as the first protection status for the agricultural areas as it brings some limits for the settlement and it describes and guarantees for the sustainability of agricultural production in long term within Soil Protection and Land Use Law No. 5403. Seeing that the conceptual needs of a management planning approaches, this status can also be seen as a managable area with its legal border as it was determined by concerning natural thresholds like soil quality/type, irrigability according to branch of the brooks and forest border around.

[1] Troas Region can be explained as the west side of a line which from Gönen brook to Edremit Gulf with a simple expression. For more info.:Cook 1973; Strabon, 1992: XIII 581-582; Leaf, 1923: s.16-46

[2] https://whc.unesco.org/en/list/849

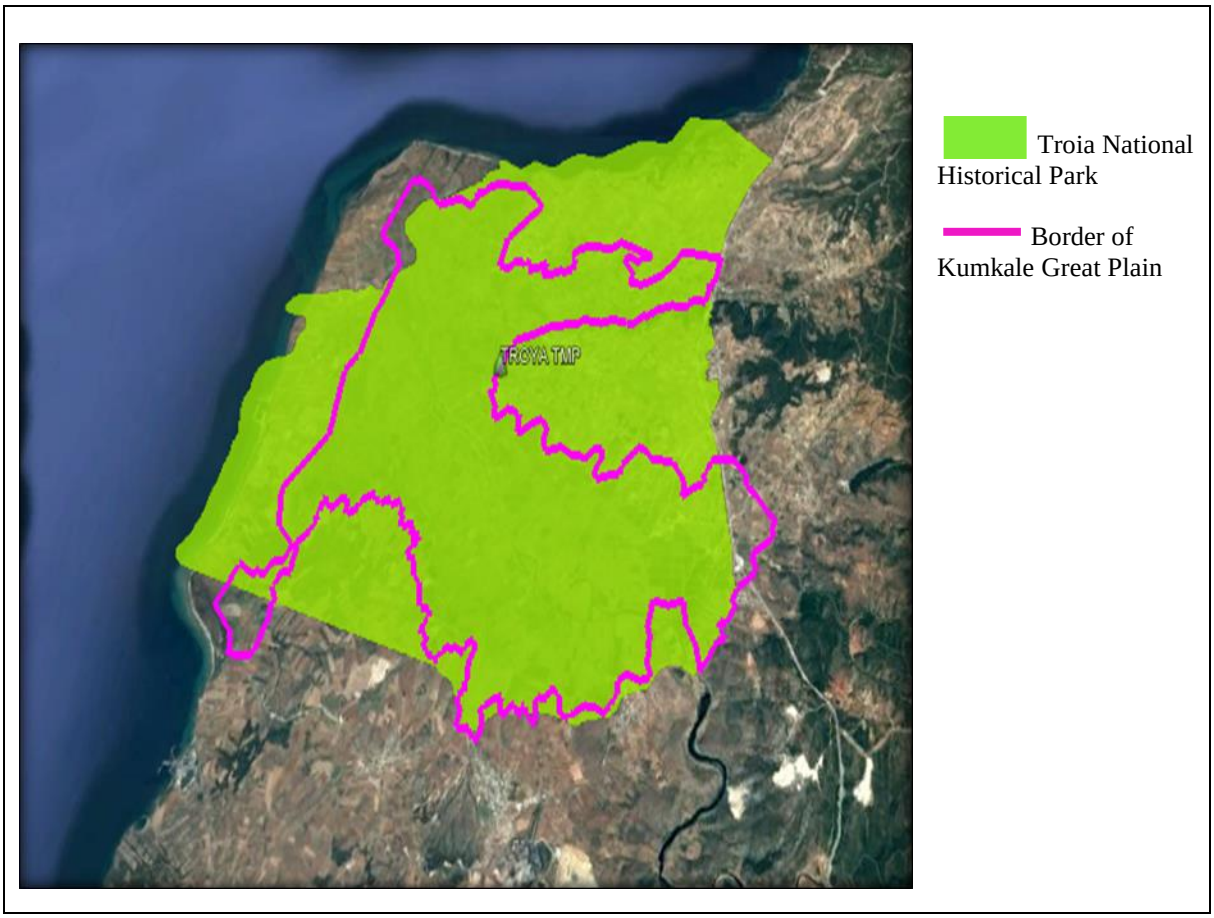

Figure 1: Kumkale Great Plain

As it can be seen the protection border in Figure 1 above, aggricultural protection areas account for %57 of total national park area. It means that natural values of the park are also very crucial besides the park's cultural-archaelogical values. Furthermore, on the ground that these values are integrated in many part, there is a need for consideration together with cultural areas in conservation policies.

2.2. Method

The methodological framework of this study is based on three successive stages:

At first, the collection of the theoretical and conceptual knowledge derived from academic and scientific works, specialized reports and critera. In this context, it is defined the main steps and components of the agricultural resources management planning and its process. Also, it is examined the guidelines and standards which are official doceuments have been published by UNESCO (United Nations Educational, Scientific and Cultural Organization), ICCROM (International Centre for the Study of the Preservation and Restoration of Cultural Property), IUCN (International Union for Conservation of Nature), ICOMOS (International Council on Monuments and Sites) and FAO (Food and Agriculture Organization). These official documents including indicators and criterias have been important to determine the alternative roadmaps or toolkits of agricultral management planning.

Secondly, it is assested main characteristics about natural and cultural heritage assests and legal status of Kumkale Major Plain which is located inside Troia Historical National Park.

Thirdly, it is defined the Sustainable Management Model for Agricultural Resources (SMAR) which create an coordination between stakeholders and describes the future strategies, politics, actions with the responsible foundations, time-limits, measurable indicators is proposed for this kind of managable areas. This model is handled in three different sub-model; The Autority Model that prioritizes inter–institutional authority–responsibility sharing, the Participation Model that base on inter–stakeholder dialogue/cooperation, The Planning–Implementation Model which defines the management topics, targets, strategies and actions.

3. Findings

3.1. Theoretical Background

The first discussions about the management of valuable sources arisen for natural and cultural heritage areas on the grounds that expanding their protection size from a single monument to large urban fabric in 1964 and cultural routes, historical gardens, cultural landscape until today(ICOMOS, 1964). This conceptual and areic expanding means that much more complex, both positive and negative social, economic cultural factors and many stakeholders which have diffent ideas, expactations and demands involve the processes and affect the areas. That's why conserving the heritage become a management problem which has multi-dimensions in terms of dynamic socio-economic, demographic, cultural, ecological environment. Seeing that the needs of a management approaches, UNESCO asked for a management plan which shows the protection/usage/interpretation/development aims, policy, actions with responsible person or organizations/institutions, budgets/financial alternative, applying, monitoring and reviweing in a colloborative way to sustain heritage sites from state parties in 1999 in the Operational Guidleness (UNESCO, 1999). Since that year all state parties have to prepare a management plan for UNESCO World Heritage Sites nomination dossier to be incribed at the list. Conservation or preservation of valuable sources like agricultural lands, ensuring the sustainability and attaining optimal benefit depend on a good management of them. In other words, similar to other non-reneweable sources, agricultural areas need a management mechanism which describes their risks, problems, potentials, and focus on planning, applying/solving, monitoring, feed backing, updating tools with proper and enough budget allocations, human and scientific/practical information inputs(Byran, et.al, 2011; Wekesa and Jönsson,2014).

Agriculture-aimed management planning approach can be expressed as a proceess that describes/shows the characterictic features of cultivation, develops a clear vision, policies, targets and action, needed to protect and promote agriculture in a management plan and guides for appling, monitoring and reviewing processes in the context of colloborative ways with all stakeholders(Balzas et. al, 2002; Branca et.al, 2011;Smeds, 2012).
In the theoretical and historical framework described so far, it can be said that heritage management has been discussed with the development of contemporary conservation approaches with 3 (three) main components (Figure 2)(UNESCO et.al, 2013):

First: Needed elements of the management are generally described as Legal Framework, Institutional Framework and intellectual, financial and human Resources. These elements of management are essential inputs that mostly defined by means of national legislation.

Second: Another requirement of management is circular processes which come together to make a management system function and to deliver results. So agricultural-aimed management planning is a circular process that involves identifing, planning(making decision), programming, implementing, monitoring, controlling, reviewing and up-dating in participatory and colloborative way (Thomas and Middleton, 2013). This process is integral part of management and it comprises of five main steps as analysing, planning, implementing, monitoring and up-dating.

Preparing an management plan is essential to guide manager in every action which is need to protect non-renewable sources and sustain through generation. It should be very practical for agricultural land in terms of:

- Briefly describe the management land and its natural, physical, environmental features
- Identify opportunities to strengthen farming as an economic sector
- Develop clear policies, target and actions to protect lands and promote agricultural productivity;
- Set resilience in communities farming against decreasing costs of yields in marketplace or natural risks like frost affect, inadequacy/over rain,
- In order to protect and maintain water run off, minimize soil erosion, and maintain compliance with applicable fertilizer standard (Anonymous, 2017).

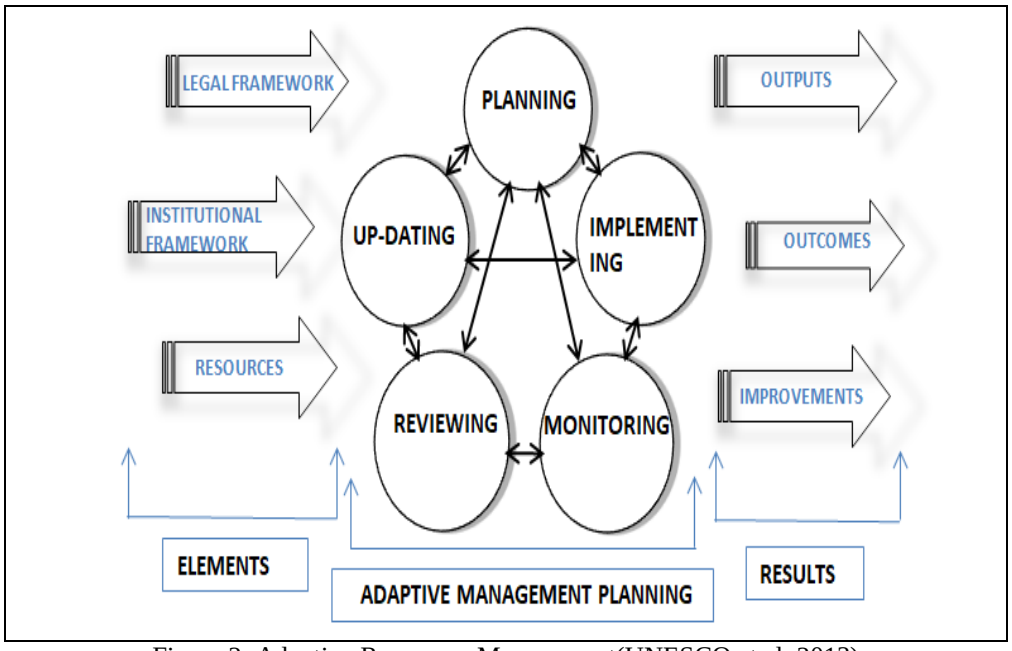

Figure 2: Adaptive Resources Management(UNESCO et.al, 2013)

Third: The last component of the management is results. These results vary as much as the expectations of all those involved in the management process but can be broadly divided into three types: "outcomes(achieving objectives","outputs(deliverable results)" and "improvements to the management system"(UNESCO et.al, 2013).

3.2. The Analysis of Agricultural Productivity-Diversity in Kumkale Great Plain

Çanakkale Province performs a high agricultural productivity performance comparing with other cities. In the city total agricultural land is 2 915 532 decare, 1 990 742 decare is area of cereals and other crop products, 204 307 decare is area of vegetable gardens, 570 560 decare is area of fruits, beverage and spices of this amount (TÜİK, 2018) .

Besides its cultural values, national park also contains six villages, named Yeniköy, Kumkale, Tevfikiye, Çıplak, Halileli and Kalafat which their economies based rural economy such as fruit-growing, vegetable growing, livestock and fishing(Figure 3). The total amount of agricultural areas of the 6 villages in the national park area is 71,383 and 48.149 of this area (67% of the agricultural areas) are irrigated, 23.234 of which (33% of the agricultural areas) are dry farming areas.

National Park consist of approximately %85 agricultural soils and %70 of this land is irrigated(these part is protected under Great Plain statue) by Karamenderes (Skamandros) Brook and Dümrek (Simoeis Brook) and the products produced have an important place both in terms of provincial and national economy.

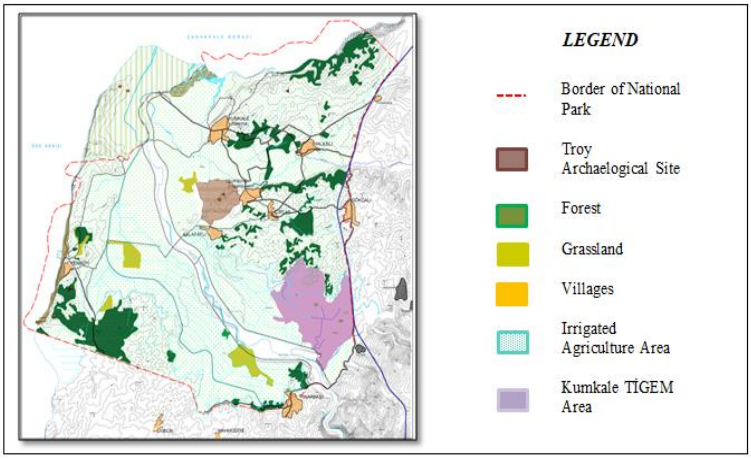

Figure 3: Current Land Use and Land Cover Map (Long Term Development Plan, 2004)

It can be cultivated various vegetable and fruits such as tomato, olive, pepper, eggplant, apple, grape in Kumkale Great Plain. The largest share in total vegetable production in the field is tomato and Çanakkale Province provides a significant part of tomato production from the national park area. Kumkale Plain in the central district of Çanakkale is the region where table tomatoes are grown most in terms of production amount and planting area It can be seen the agricultural production potential of Kumkale Great Plain in the Table (1) and Table (2). The most produced cropland product is wheat(32,568 da), the vegetable is tomato(16,860 da) and the fruit is olive(18,851 da). Due to its geographical location and climatic conditions, tomato produced in Çanakkale has its own unique aroma and flavor with high quality. Because of these features, it is known and demanded as "*Çanakkale Tomato*" in major markets of the country.

There are also attempts to protect the agricultural productivity and soil from chemicals such as good and organic agricultural practices as can be seen below;

- **a)** As of 2016, 5 farmers in Kumkale and Yeniköy villages carry out good agricultural activities in an area of 328.26 decares for olive, tomato, apricot, peach, apple and plum.
- **b)** In the villages of Mahmudiye, Pınarbaşı and Üvecik Villages, whose village borders are partially located in the national park area, as of 2016, 11 farmers are doing good agricultural activities in the area for 797.33 in total.
- **c)** Good agricultural activities are carried out for peach species in an area of 6000 decares by Anadolu Etap company on TIGEM Kumkale Agricultural Enterprise lands.
- **d)** In addition, 1 farmer from Pınarbaşı Village is doing organic farming for olives in an area of 22 decares in the national park area.

In addition, Akçapınar and Gökçalı Villages, whose village borders are partially located in the national park area, are mostly organic farming practices for olive species outside the national park area (Anonim, 2018).

The first Long Term Development Plan for the Troia Historical National Park was prepared in 08.06.2004 and it is revised in 14.10.2010 and the last revision completed 09.09.2015 according to the National Parks Law No. 2873.

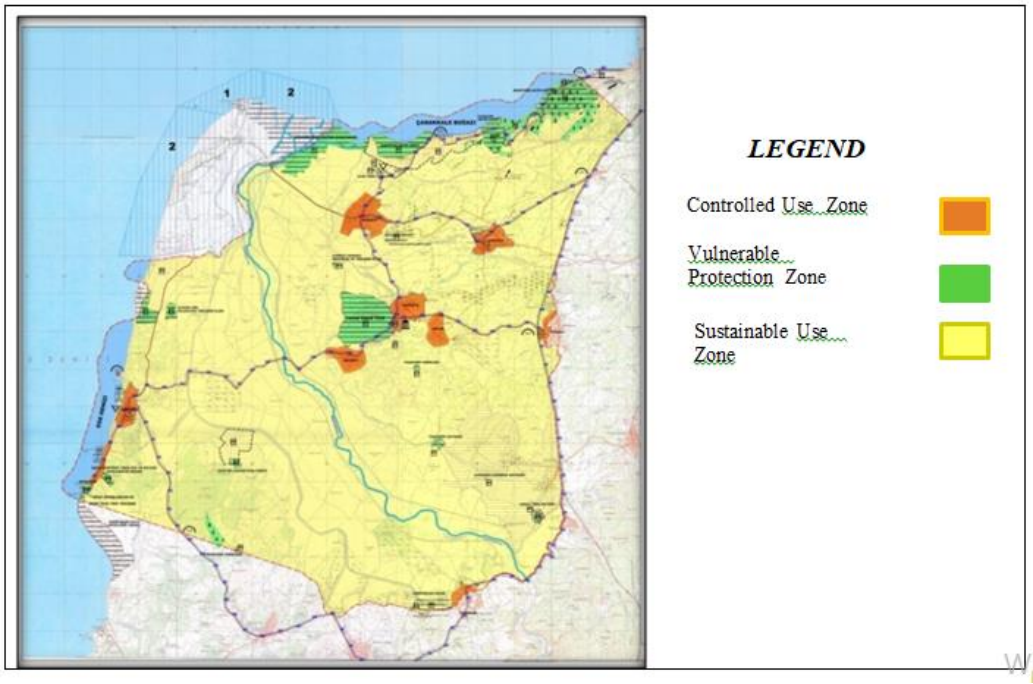

Figure 4 : Long Term Development Plan (UDGP,2015) (Last Revision 2015)

Table 1. Cropland Products in Kumkale Great Plain (Source: Provincial Directorate of Food, Agriculture and Livestock).

VILLAGES	AGRICULTURE LAND (da)	DRY LANDS (da)	IRRIGATED LANDS (da)	CROPLAND PRODUCTS (da)																						
				Wheat	Barley	Oat	Rye	Paddy	Corn	Corn for silage	Oat (K.Ot)	Broad Bean	Chickpea	Dried Beans	Vicia Sativa	Cotton	Sesame	Sunflower	Canola	Onion	Clover	Trefoil	Sorghum	Fallowing	Other cropland products	Total
AKÇAPINAR	10,912	2,220	8,692	986	569	12	0	0	688	36	56	55	22	2	47	10	0	212	0	5	180	0	60	16	0	**2,956**
ÇIPLAK	9,640	2,140	7,500	1,217	518	0	0	508	2,950	146	22	1	15	0	104	0	0	1,576	0	0	110	0	0	9	0	**7,176**
DÜMREK	7,172	2,310	4,862	765	887	22	0	0	280	22	182	210	52	6	116	0	0	0	0	20	220	5	40	16	0	**2,843**
ERENKÖY	8,290	8,090	200	2,481	974	46	0	0	88	28	174	146	177	29	156	0	0	262	0	30	40	0	0	18	51	**4,700**
GÖKÇALI	5,328	2,828	2,500	1,414	491	13	0	0	165	7	179	242	33	0	121	0	0	255	0	0	35	0	0	16	26	**2,997**
HALİLELİ	10,593	3,390	7,203	2,292	981	0	0	0	2,360	98	32	110	54	74	182	0	0	1,580	0	8	265	0	24	13	16	**8,089**
KALAFAT	6,090	1,363	4,727	1,658	868	12	0	284	830	103	118	0	15	6	106	0	0	815	0	0	85	0	0	17	4	**4,921**
KUMKALE	30,120	8,920	21,200	9,576	2,332	153	0	1,911	3,015	580	170	50	170	28	330	125	0	5,280	0	0	230	0	0	52	10	**24,012**
TEVFİKİYE	7,040	4,321	2,719	794	135	9	0	1,520	1,091	315	76	84	0	2	58	0	0	878	0	0	175	0	0	0	40	**5,177**
MAHMUDİYE	4,550	3,500	1,050	5,453	1,100	25		2,500	2,560	500		137	51	25	38	30		1,910			106			115		**14,550**
TAŞTEPE	700	700	0	155	50	100			250	5		35		5				50			70					**720**
ÜVECİK	700	700	0	3,250	770	10		200	200	470		150	25	5	80			600			10		35	315		**6,120**
YENİKÖY	3,000	2,600	400	1,780	300			500	200	40		70		20	100			302			65			450		**3,827**
PINARBAŞI	2,550	2,000	550	747	300	20		1,080	2,280	325		60	5	15	220	20		250			180			40		**5,542**
Total	106,685	45,082	61,603	32,568	10,275	422	0	8,503	16,957	2,675	1,009	1,350	619	217	1,658	185	0	13,970	0	63	1,771	5	159	1,077	147	80,655

Table 2. Vegetables and Fruits produced in Kumkale Great Plain (Source: Provincial Directorate of Food, Agriculture and Livestock)

VILLAGES	TOTAL CROPLAND(da)	Vegetable (da)														Fruit(da)													
		Cabbage	Spinach	Leek	Cucumber	Eggplant	Tomato	Pepper	Capia Pepper	Melon	Watermelon	Green Beans	Other vegetables	Greenhouse	Total Vegetable	Pear	Apple	Peach	Nectarine	Cherry	Apricot	Plum	Olive	Grapes	Walnut	Almond	Other Fruits	Total Fruits	TOTAL (da)
AKÇAPINAR	**2,956**	0	4	0	0	2	590	25	150	370	96	2	5	0	**1,244**	0	0	3753	880	3	630	3	1,373	0	52	0	18	**6,712**	**10,912**
ÇIPLAK	**7,176**	0	0	2	2	1	1,390	15	340	245	19	1	20	3	**2,038**	0	0	19	25	8	12	0	339	2	14	0	7	**426**	**9,640**
DÜMREK	**2,843**	1	5	1	1	28	700	5	30	24	9	3	40	0	**847**	8	35	47	0	76	43	6	2,961	7	216	65	18	**3,482**	**7,172**
ERENKÖY	**4,700**	0	3	0	0	3	210	0	15	42	7	1	7	0	**288**	2	9	2	0	3	1	1	2,428	817	30	0	9	**3,302**	**8,290**
GÖKÇALI	**2,997**	0	0	0	0	0	1,120	0	50	146	35	2	25	2	**1,380**	0	0	0	0	0	8	0	813	0	130	0	0	**951**	**5,328**
HALİLELİ	**8,089**	16	20	7	3	5	1,260	10	110	153	5	5	16	3	**1,613**	6	34	41	16	58	4	0	493	131	10	86	12	**891**	**10,593**
KALAFAT	**4,921**	0	0	0	0	0	790	0	80	149	10	1	22	0	**1,052**	6	0	0	0	0	0	0	91	5	15	0	0	**117**	**6,090**
TEVFİKİYE	**5,177**	4	1	2	1	1	1,280	35	50	100	7	1	52	0	**1,534**	0	52	99	10	0	0	0	153	0	15	0	0	**329**	**7,040**
KUMKALE	**24,012**	12	0	0	0	0	4,870	70	300	93	32	1	80	0	**5,458**	0	78	64	0	0	36	16	411	15	30	0	0	**650**	**30,120**
MAHMUDİYE	**1,913**	10	10	11	30	12	2500		780	55	35	10			**3,453**		53			20	25		3500	10	10	20		**3638**	**9,004**
PINARBAŞI	**1,425**				25	7	1010	5	550	25	10				**1,632**		31			7			1499	20				**1,557**	**4,614**
TAŞTEPE	**632**					5	100		40						**145**			30			5		340	5	30			**410**	**1,187**
ÜVECİK	**1,688**		5		32	10	510	5	350		20				**932**		30			5			3550	20	85	25		**3,715**	**6,335**
YENİKÖY	**622**		5		23	11	530	5	330						**904**		5						900	25	27			**957**	**2,483**
TOTAL	**69,151**	**43**	**53**	**23**	**117**	**85**	**16,860**	**175**	**3,175**	**1,402**	**285**	**27**	**267**	**8**	**22,520**	**22**	**327**	**4,055**	**931**	**180**	**764**	**26**	**18,851**	**1,057**	**664**	**196**	**64**	**27,137**	**118,808**

In the last revision plan, Kumkale Great Plain described as Sustainable Use Zone which is not allowed any new settlement except for the agricultural usage purposes such as infrastructure facilities for soil protection and irrigation, non-integrated livestock and aquaculture production and preservation facilities. And it is planned to develop "Good Agricultural Practices" and "Organic Agriculture" in the park area step by step for the coming 5 year.

3.3. Sustainable Management Model for Agricultural Resources (SMAR)

Sustainable Management Model for Agricultural Resources (SMAR) for Kumkale Great Plain is composed of 3 (three) components headings as based on authority-responsibility basis Management Model, stakeholder dialogue / collaboration coordination basis Participation Model, integrated heritage management strategy basis Planning–Implementation Model

3.3.1. Management Model: Authority-Responsibility

According to the Soil Protection and Land Use Law No. 5403, the main responsible government institution of the area is Ministry Of Agriculture And Forestry. This institution shares the autority with the Çanakkale Provincial Agriculture And Forestry Directorate and Natural Protection-National Park Branch Directorate, based on national park status. So these institutions and directorates can be accepted main responsible autority. On the other hand local/indigenious people, property owners, villagers who subsistence agriculture, educational institutes like local üniversities' departments, development agencies and cooperative association-NGO's which founded for agricultural activities/works need be taken as stakeholders in the context of colloborative management.

3.3.2.Participation Model: Stakeholder Dialogue / Collaboration

The Participation Model, which enables all stakeholders to take an active role and based on broad participation, transparency and cooperation principles, should be determined in the stage of understanding the existing spatial-functional characteristics, values of the management area, the production of plan, implementation and supervision of the area in the context of these values.

As a matter of fact, it can be said that the success of Kumkale Great Plain management is based on determination of principles and strategies to ensure cooperation and coordination of local and national institutions, local people and civil organizations at every stage of planning – implementation, monitoring – supervision, revision processes.

In this scope, the guidelines prepared by IUCN and Eurosite may be preferred as a method for the stakeholders participation and colloboration. The types of participation in the guideline prepared by IUCN are divided into 5 groups: Information, Consultation, Deciding Together, Acting Together, and Supporting Local Community Interests, from the least to the highest according to the activity of the participation. Another guide which was prepared for the management of natural areas by Eurosite describes the methods of consultation and public participation during the plan preparation phase as Face-to-Face Meetings, Two-Sided Meetings with Special Focus Groups, Exhibitions and Presentations of Field Experts in Question-Answer Form, Inviting as an Audience, Informal (Controlled) Diversified in the form of Public Meetings).

Table 3:Stakeholder Analysis and Participation Types

	Stakeholders	Participation Type
Central Level	Ministry Of Agriculture And Forestry	Co-decision-making,co-operation Periodic audit of the management as main institutes
Local Level	Çanakkale Provincial Agrıculture And Forestry Directorate and Natural Protection And National Park Branch Directorate	
Local Government	Çanakkale Municipality	Co-Decision Making Acting Together
Local People	6 Villages: Tevfikiye, Kumkale, Çıplak, Halileli, Yeniköy, Kalafat	Professional Focus Group Meetings Demand / Approval Surveys Consultation Co-Decision Making Acting Together
Ngos	Kumkale Agricultural Credit Cooperative No. 2517 Association of Cooperatives for Development and Other Agricultural Purposes	Consultation Face to Face Meetings- Acting Together
Other Corporate Stakeholders	Provincial Directorate of National Education Provincial Directorate of Public Education	Together Decision Making Acting Together
	Related Departments of Regional Universities	Consultation Acting Together
	South Marmara Development Agency Çanakkale Investment and Support Office	Together Decision Making Acting Together
	Anadolu Etap Private Company	Consultation-Face to Face Meetings- Acting Together

3.3.3. Planning–Implementation Model: Management Strategies on Agricultural Resources

As SMAR Model consists of the analysis/explanation/defining of alternative road maps and toolkits, planning (making decision for the sustainable protection, development and use of the resource and function values of the management area), programming, implementing (strategies for the implementation of the decisions), monitoring, controlling, reviewing and up-dating in participatory and colloborative way after the implementation process. Preparing a plan for the Kumkale Great Plain starts by determining and awaring functional and spatial characteristic features such as climate, soil quality, water supply, drenaige, production capacity etc. of the area. After that all characters of the area should be evaluated with strengths, weaknesses, oppurtunities, threats and made decision about vision, aims, actions for future together with allocating financial options and describing performans indicators, deciding applying strategies like zoning, action plan for a year with projects and annual and five year full review strategies of the management plan. The purpose of this management model is to clearly reveal the character, conditions, values, usage of agricultural lands, production capacity, social, environmental, climatological, antropogenic problems, define the opportunities, threatens and deciding protection/usage/interpretation/development aims of existing and potential agricultural lands and the actions, need to achieve them along with financial, responsible stakeholders, time limitations and achievement indicators. Also implenting strategies like zoning, projecting, annual action/work plan and monitoring/evaluating/updating strategies as annual and five year according to achievement indicators should be briefy defined to attain an adaptive management in the plan. The main focus of this study is to describe the methodological approach for an adaptive management planning that identify, protect, develop and promote the agricultural resources at the example of Kumkale Major Plain in the conceptual framework of management planning. In this scope, it is possible to determine management topics, target, strategies and actions for the Kumkale Great Plain by concerning the its social, environmental, physical features like soil quality, water dreinage and main water sources for the area and its relation with the Troy archaelogical site and tumuluses. The main management topics can be divided in three headings according to the literature review about Sustainable Agricultural Land Management as stated in table 4 below (Conant, 2010; Vallis et al., 1996; Pan et al., 2006; Woodfine, 2009; Thomas, 2008).

Table 4: Management Plan Proposal in the Context of Managable Topics.

MANAGEMENT TOPICS	TARGETS	STRATEGIES	ACTIONS
1) Soil and Water Conservation	**Target 1:** Ensuring the Sustainable Conservation of Soil and Water	**Strategy 1.1:** Conservation and sustainable use of ground and surface water resources	Action 1.1.1: Periodic monitoring of flow rates, physicochemical properties and pollution conditions of water resources and taking necessary measures Action 1.1.2: Eliminating the pollutants of the water resources by controlling the equipment and activities that pollute or contaminate the underground and surface water resources in the National Park area Action 1.1.3: Irrigation in irrigated areas is essential to use water-saving modern methods (pressure drip irrigation, tanks, birkas etc.)
		Strategy 1.2: Development of sustainable agriculture in the National Park area for the conservation of the agricultural soil	Action 1.2.1: Promoting "Good agriculture practices" and "organic agriculture" for sustainable agriculture within the National Park, Action 1.2.2: - During the agricultural struggle applied in the field, unconscious spraying should be prevented and natural balance should be prevented. Action1.2.3: Prohibited activities in the field such as firing should be prevented through mobile control officers

Table 4: devam ediyor.

2) Agronomic Practices	**Target 1:** Developing Agronomic Practices in the park area	**Strategy 1.1.** Crop rotation **Strategy 1.2:** Minimizing the degradation of human use in the National Park **Strategy 1.3:** Developing eco-tourism activities in order to evaluate the potentials of the National Park area **Strategy 1.4:** Supporting the sale of local / traditional products depending on the eco-tourism activities and creating a brand or image from these products	Action 1.1.1: According to the results of analysis of soil and water samples to be taken from different parts of the area according to the changing product pattern every year, suitable agricultural production, spraying and fertilizing proposals should be developed in order to prevent unconscious alteration of the chemical structure of the soil and prevent unnecessary resource consumption by selecting suitable products for soil properties. Action 1.1.2: Citizens living in the area should be informed about the products that can produce higher income from the unit area and that are produced or can be produced in accordance with the soil structure and specific to the region and directed to these products. Action 1.2.1: For this purpose, ecological agriculture in the fields of agriculture should be promoted and farmers training and realization of "sample farmer" programs should be began with the contribution of Provincial Directorate of Agriculture and Universities. Action 1.3.1: Providing eco-tourism education to local people, interest groups, administrators and students Action 1.4.1: Promoting ecological agriculture in the National Park and production unions / cooperatives etc. for this purpose and creation of a brand value of local products
3) Nutrient Management	**Target 1)** Attaining healty products	**Strategy 1.1:** Organic fertilizing, composting, manure	Action 1.1.1: Increasing the nutrient of soil by organic fertilizing Action 1.1.2: Using of animal manure and green manure should be promoted

4. Conclusion And Recommendation

Agriculture has played a significant role in civilization of humanbeing for many years and it still has multi-dimensional positive affects on both development and under-development countries. On the other hand agriculture sector has its own dynamics, threatens and weaknesses. The fact that it depends on natural environmental conditions, increases the risk and uncertainty of its productivity. Given that its own threatens and potentials, it needs to be managed via a mechanism that deals with the changing socio-cultural, economic and ecological environment with different dynamics and dimensions.

Management planning approach has been used for cultural and natural heritage sites for nearly fifteen years after UNESCO's demand from state parties. Although agricultural resources are as important as cultural and natural sites, still there is no a prepared management planning approach example for agricultural resources except cultural sites in Turkey. This paper attempts to define a management planning model and its components for sustainable management of agricultural resources. This model is named Sustainable Management Model for Agricultural Resources (SMAR).

The first need is determining a managable agriculture area with its legal and defined borders which is defined by concerning its natural threshholds. In this scope border of Kumkale Great Plain can be seen as a legal protection status for the agricultural areas in Turkey. After that, by concerning the strategical management planning approaches, functional and spatial characteristic features of the area, main and other stakeholders are defined and vision, strategies, and actions are defined to protect the are with responsible institutions, budget and estimated time. In this paper, it was considered the main topics to crate a base by evaluating the area's needs.
Considering the agricultural potential of the national park area and its surroundings, it is understood that organic and good agricultural practices are far below the level they should actually be. Farmers in the national park area should be directed to good agricultural practices through incentives and supports. Increasing organic and good agricultural practices will both increase the income of the peasants in the field and protect the ecosystem through the use of controlled medicines and fertilizers.

It is considered that Sustainable Management Model for Agricultural Resources (SMAR) presents an alternative management planning approach for academic–scientific research project and also contributes implementation projects focused on sustainable management of agricultural resources in the context of national and local goverments as the decision maker

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