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Research Article

ESSENTIALS OF A SUSTAINABLE LAND USE PLANNING APPROACH FOR RURAL AREAS AND A MODEL PROPOSAL TO BE APPLIED UNDER TURKISH CONDITIONS

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ABSTRACT

The Turkish planning system is lack of macro-scale spatial plans at national and regional levels as well as micro-scale land use plans at local levels for rural areas, which are to be produced pursuant to the Law No. 5403 on Soil Protection and Land Use Planning. Integration of land consolidation, irrigation and crop pattern projects with agricultural and rural development projects and land use planning initiatives is another issue which has to be associated with location decisions for agro-based industrial sites and zones in ensuring economy-ecology balance and fulfilling requirements of sustainability principle in development planning.

Although the General Directorate for Agricultural Reform (TRGM) initiated preliminary activities for agricultural land use planning based on certain workshops organized in 2011; however, an obvious progress could not be achieved. Beside various reasons, the required projects by the Law No. 5403 found no chance to be launched yet, since agriculture-based land use planning asks for a teamwork cooperation among certain professionals such as agricultural economists, soil scientists, physical planners, surveyors, sociologists, economists, ecologists, etc. Lack of such interdisciplinary organizations have regretfully hindered production and implementation of such projects in Turkey, even at pilot dimensions. This study focuses on initiatives geared towards macro-scale land use plans for rural areas, expected benefits from rural land use planning attempts, essentials of sustainable land use plans for rural areas and concludes with an application model proposal.

Keywords: *Land Use Plan, Agriculture-Based Land Use Planning, Rural Development, Macro Scale Spatial Plan, Soil Threshold Analysis*

1. INTRODUCTION

Spatial planning policies which are targeted at a balanced development in principle are influenced by society, economy and environment (EC-JRCLUP, 2006). Within these main categories, relevant objectives are defined. Among these objectives are common; trying to provide as much living conditions as possible for the population, trying to improve these living conditions by creating a balanced economy and social system structure, protecting the population and the environment from damages caused by natural or man-made extraordinary events, natural resources, especially ecosystems (plants, animals and landscaping) to protect land, water and climate, to provide housing, infrastructure, recreation opportunities for social, educational needs of the society, to secure agricultural resources to ensure the supply of society to food and related raw products, to improve land use in ecological and economic capacities and balance, to give priority to the public interest.

Land-use planning is the systematic assessment of land and water potential, alternatives for land use and economic and social conditions in order to select and adopt the best land-use options. Its purpose is to select and put into practice those land uses that will best meet the needs of the people while safeguarding resources for the future. The driving force in planning is the need for change, the need for improved management or the need for a quite different pattern of land use dictated by changing circumstances. All kinds of rural land use are involved: agriculture, pastoralism, forestry, wildlife conservation and tourism. Planning also provides guidance in cases of conflict between rural land use and urban or industrial expansion, by indicating which areas of land are most valuable under rural use (FAO, 1993).

Land use planning is an instrument of the technical co-operation used in resources management (forestry, production systems compatible with resources and agroforestry, pasture management, nature protection and erosion control), rural regional development, community support and village development, government consultation (environmental strategy planning, agricultural sector planning, development planning, assessment of land potential (B. Amler, *et al*, 1999).

The prime provisions of the Law No. 5403 envisage development of prototype projects for agricultural enterprises and micro-level settlements as well as promotion of their extensive use with appropriate applications and adjustments to local conditions. Integration of land consolidation, irrigation and crop pattern projects with agricultural and rural development projects and land use planning initiatives is another issue which has to be associated with location decisions for agro-based industrial sites and zones in ensuring economy-ecology balance and fulfilling requirements of sustainability principle in development planning. For these reasons, agricultural land use planning has become a necessity.

In this paper, a practical/applicable model has been developed in order to solve the problems encountered due to lack of agricultural land use plans. This proposed methodological approach has been developed in a fit for purpose approach and is considered to be easily applicable in all developing countries under the United Nations Sustainable Development Goals (SDG's).

2. INITIATIVES TOWARDS MICRO-SCALE LAND USE PLANS FOR RURAL AREAS

The Environs Plans prepared in Turkey at 1/100,000 scale are essential for protection of the natural and ecological assets in course of national development processes, whilst those prepared at 1/25,000 scale are for regulating functional and spatial relations between the settlement centers and their peripheral areas. Other lower scale plans prepared at 1/10,000 or 1/5,000 scales stand as Master Plans for urban development, whilst 1/1,000 scaled Implementation Plans include detailed indications for applications. These plans are produced for every urban settlement center in Turkey, which possess the characteristics of physical land use development and spatial organization plans for socio-economic activities. Although up-to-date some studies have been carried out at upper scales, neither national nor regional development plans have been prepared at 1/1,000,000; 1/500,000; 1/250,000 scales, yet. In addition to absence of such upper scale macro-plans, lower scale micro-plans are also missing in the Turkish planning practice.

In order to avail a thorough consultation on the preparation of micro-scale land use plans for rural areas in Turkey, a 2-day workshop has been organized by the Ministry of Food, Agriculture and Livestock (Restructured in 2018 as Ministry of Agriculture and Forestry) which took place between 21-22 December 2011 in Ankara, Turkey with participation of central and local ministerial staff, academicians, practitioners, consultants and NGO representatives. The focal theme of the workshop was "A Quest for Methodology of Agricultural and Rural Land Use Planning in Conformance with EU Standards", whilst the main discussions were centered around effective integration of agricultural and rural development into the spatial planning system of Turkey.

In context of intensive discussions in above mentioned workshop pertaining to controversial approaches as "top-down planning" and "bottom-up planning"; a sound "bottom-up planning" approach starting from lower scale micro plans and climbing towards upper scale macro plans could be formulated for Turkey. This approach was aimed at:

- Re-organization of the national spatial distribution system to enhance the efficiency of functions allocated to rural settlements and agricultural centers, as well as
- Incorporation of agricultural aspects into physical and urban development plans widely and amply, in order to strengthen the instrumental basis of agricultural and rural development policies and practices.

These policies were then associated with respective strategies which envisage:

- Giving priority to diversification and extension of micro-scale and local level planning works in course of "bottom-up" initiatives,
- Devoting relevance to natural and ecological aspects in planning the man-made physical and socio-economic environment,
- Optimal raking of metropolitan, major, secondary and small urban centers, rural service centers and agro-industrial bases within the framework of agropolitan and integrated rural development models,

- Filling the spatial dimension gap of socio-economic development plans (5-year national development plans and annual investment programs) prepared by the former state planning organization (SPO) and current ministry of development on sectoral basis.

Unfortunately, there has been no noteworthy record of progress in these policy issues and connected strategies over the past six years. Notwithstanding, the following activities of the GDAR carried out in June were standing in the website of the Ministry of Food, Agriculture and Livestock as of September 2017 indicating that:

- Identification of technical specifications and their announcement in the tender document of the Land Use Planning project for the Şile District of the Istanbul Province are conducted, while
- Inspection and ex-post evaluation works pertaining to applied land consolidation and on-farm service projects are on-going along with
- Opinions and attitudes related to agricultural development which have to be taken into account in course of spatial development and physical reconstruction plans and projects are elaborated.

As a matter of fact; above mentioned activities hardly comply with appropriate decisions and rational land use intentions, where spatial dimensions of development are sufficiently emphasized and adequately incorporated to planning processes. The shortcomings in formulation of opinions and attitudes of the Ministry of Food, Agriculture and Livestock to be taken into account by the Ministry of Environment and Urbanization in preparation of Environs Plans always hampered allocation of fertile lands in favor of industrial land use and housing purposes, which led to successively diminishing agricultural areas and consequently ecological distortions.

3. EXPECTED BENEFITS FROM AGRICULTURAL AND RURAL LAND USE PLANNING

The absence of spatially disaggregated upper scale macro-plans and lower scale micro-plans create serious handicaps in elaborations on and formulation of development objectives, which have to be ultimately oriented towards providing a nation-wide urban-rural integration in functional and spatial terms. Filling the micro-plan deficit by comprising agricultural and rural land use planning in Turkey would provide an excellent basis to deal with political, regulative and operational aspects of this matter of concern with diverse benefits which could be categorized as mentioned below:

- i. Political benefits
 - Identification of implementation and action areas for support and subsidy policies and instruments in the light of agricultural land use and rural development planning guidelines
 - Giving orientation to spatial distribution of agricultural production activities and rural development investments
 - Fulfilling the requirements of natural resources management and environmental protection principle in the preparation of agricultural development and rural land use plans
 - Referring to risk estimations (pollution, climate change, salination, etc.) in the preparation of

agricultural and rural development and land use plans

- Encouragement of “bottom-up planning” initiatives originating from local levels and extending to national level in the Turkish planning process
- ii. Technical and operational benefits
 - Integration of prototype projects for agricultural enterprises, farming practices and agro-industrial facilities in land use plans with regard to local activities and rural settlement characteristics
 - Integration of land consolidation and on-farm service projects in land use plans
 - Identification of the crop pattern depending on agricultural marketing analyses and predictions
- iii. Legislative and administrative benefits
 - Cooperation with the Ministry of Environment and Urbanization for effective integration of agricultural and rural land use plans in the overall spatial planning processes
 - Cooperation with the Ministry of Development to devote more emphasis to agricultural and rural development planning as well as collaboration with the Regional Development Agencies for diversification of supports oriented towards local level initiatives
 - Cooperation with the Ministry of Science, Industry and Technology in location planning for agro-industrial plants and zones
 - Cooperation with the Ministry of Agriculture and Forestry for integration of hydrological resources and forest management issues in agricultural and rural development and land use planning
 - Cooperation with the Ministry of Energy and Natural Resources for integration of underground resources in agricultural and rural development and land use planning
 - Cooperation with the Ministry of Transport, Maritime and Communications for fulfilling transportation and logistics requirements of agricultural marketing and land use planning

4. ESSENTIALS OF SUSTAINABLE LAND USE PLANS FOR RURAL AREAS

Effective integration of the natural environment including soil, water and air components with the man-made environment including socio-economic and built-up components on the basis of sustainability principle is a prerequisite for making successful development plans. (Ercan, O., Dericioğlu, K.T., October 14, 2013, and October 21, 2013)

Within this framework, it is essential to precisely analyze:

- Soil, forest, water and underground resources in the “geography based” natural environment,
- Industry, trade, service and tourism activities in the “economy based” man-made environment,
- Education, health, culture and housing activities in the “society based” man-made environment,
- technical infrastructure, transportation and logistics activities in the “physical linkage based” man-made spatial environment

and to adequately match them with each other. The utmost relevant issue in planning process is attaching due regard to functionality, rationality, sustainability and integrity principles throughout location decisions and implementation actions. Effectiveness in implementation of actions relies on strong substantiations for taken decisions, whereas updated and disaggregated databases are required for strong justifications.

The primary goal of harmonization and integration of natural and man-made environments is to reduce economy and ecology conflict up to the possible lowest level and to ensure a balance between these two system components. For this purpose, it is unavoidable to simply investigate the interrelations between the (man-made) settlement centers and the (natural) life support systems in their surroundings. Identification of the optimal demographic size of settlements for meeting the requirements of human activities and community needs from life support systems adequately is necessary for sake of sustainability. Urban congestions in certain areas or over-population tendencies in certain settlements have to be avoided for protection and rational use of natural resources. In this respect, the indicative characteristics of plans associated with imperative provisions and enforcement instruments are of utmost importance.

The primary provisions of the Law No. 5403 on Soil Protection and Land Use Planning envisage:

- i. Development of prototype projects for agricultural enterprises and micro-level settlements as well as promotion of their extensive use with appropriate applications and adjustments to local conditions,
- ii. Integration of land consolidation, irrigation and crop pattern projects with agricultural and rural development and land use planning initiatives,
- iii. Focusing on agro-based industrial sites and zones in ensuring economy/ecology balance and fulfilling the requirements of sustainability principle in development planning,
- iv. Referring to functionality principle and relying on swot (strengths, weaknesses, opportunities, threats) analyses in spatial re-organization and land use planning tasks.
- v. Saving land by preventing the loss of its features by natural or artificial ways and developing and determining planned land use based on principles of sustainable development (Çay. T. *et al*, 2017).

In producing land use plans for rural and agricultural areas, high priority is to be devoted to:

- Inputs for agricultural production and husbandry (labor force, pesticides, insecticides, fodder, mechanical equipment, seeds, fertilizers, etc.),
- Agricultural production activities and enterprises,
- Gathering of agricultural products and their processing, packaging, warehousing, dispatching, distribution, etc.,
- Consumption norms,
- Waste disposal and sanitary landfill, refusal treatment and recycling, composting and renewable energy generation, etc.

Creation of a hierarchical scheme of production, processing and service centers in compliance with the

rationality principle is a basic requirement in spatial re-organization and land use planning tasks. The followings are pertinent functions and roles which the small-sized urban centers in rural areas have to play as well as services they have to provide within the hierarchical scheme of centers:

- Input (seeds and fertilizers) supply along with mechanization and equipment maintenance and repair etc. In context of agricultural production services,
- Administration along with education and health, cultural and social amenities and facilities etc. In context of social infrastructure services,
- Transportation along with water, electricity and gas supply, waste water treatment, solid waste disposal and sanitary landfilling, etc. In context of technical infrastructure services.

5. DETERMINANTS AND DIMENSIONS, PRINCIPLES AND APPROACHES IN PLANNING PROCESS

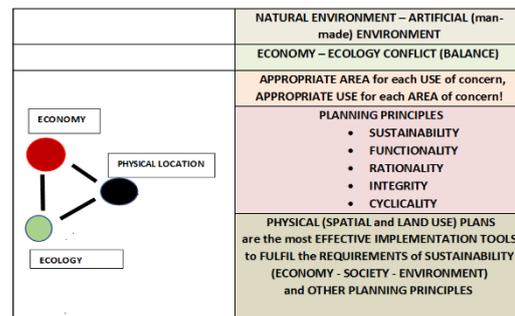


Fig. 1. Determinants and dimensions, principles and approaches in the planning process (Project on the Establishment of Macro Framework for Agricultural Land Use Plans in Thracian Provinces and Ergene Basin (2012); TR Ministry of Food, Agriculture and Livestock, General Directorate of Agricultural Reform, Ankara, Turkey)

The main determinants which have to be tackled with throughout a certain planning process are economic and socio-economic functions, physical and spatial location options as well as ecological and natural features of the area of concern.

Economy stands for functions which are related with sectoral development plans in the planning system of Turkey. Sectoral development plans are prepared by the Ministry of Development at national level and by affiliated Regional Development Agencies at regional level. The physical locations of sectors and planned functions are elaborated in and modelled by urban master and physical development plans, which are produced primarily by the Ministry of Environment and Urbanization and secondarily by the Ministry of Transport, Maritime and Communications, the Ministry of Science, Industry and Technology as well as Ministry of Culture and Tourism, etc. whenever required and wherever deemed necessary.

Ecology, on the other hand, is regulated through environs and landscape plans, which are produced by the Ministry of Environment and Urbanization. The Ministry

of Agriculture and Forestry; the Ministry of Energy and Natural Resources are other important actors with regard to the planning of ecological structures and natural assets.

Within the “economy - physical space - ecology” triangle, “natural environment - artificial environment” and “economy - ecology” balance/conflict should be regulated within the framework of “appropriate area for each use of concern versus appropriate use for each area of concern” principle with due regard to pertinent planning principles.

6. APPLICATION MODEL PROPOSAL IN REGARD OF CURRENT COUNTRY CONDITIONS

Relying on above mentioned theoretical explanations and implementation approaches in general as well as regulations and practices in particular, a certain methodology can be developed and proposed for Turkey in compliance with current conditions. The details of such a proposal for preparation of agricultural land use plans are mentioned below, which is composed of project management, data collection and processing, analysis and evaluation, decision making and planning components as a whole. The coverage of each component is briefly described under following headings.

6.1. Project Management Method

System set-up in scope of project management includes;

- i. Identification of project operation framework by the GDAR,
- ii. Ensuring the establishment of an organization and coordination structure with the aim of effective collaboration between the GDAR representatives and representatives from other ministries as well as launching local meetings (identifying the actors to be included in the project, indicating priority meetings at provincial level, setting an information exchange basis, etc.)
- iii. Creating templates comprising;
 - Information request form for data to be obtained from related institutions,
 - Questionnaire form,
 - Analytical tables for environ plans,
 - Comparative tables for environs plans,
 - Analytical tables for regional reports,
 - Swot tables,
 - Current situation reports,
 - District information sheets,
 - Synthesis reports and information sheets,
 - Protection-use pattern,
 - Inquiry system,
 - Systems approach for identification of agricultural ecological structures,
 - Legends, and
 - Plan provisions.
- iv. Setting up the reporting system by determining;
 - visual design of the report,
 - scope and contents of the legend.

- v. Organization of the workshop to introduce the project to all public stakeholders and steering of the implementation by;
 - identifying the stakeholders,
 - preparing the workshop presentations and conducting visualization works.

6.2. Spatial, Institutional, Scientific and Statistical Data

4 different data sets will be used as for land use planning projects.

6.2.1. Spatial Data

Digital maps of respective institutions and organizations indicating the boundaries of demanded and permitted areas for non-agricultural land use, soil database, legend data based on Law No. 5403, topographic maps, rangeland database, forest data, landscape plans at 1:100,000 scale, master plans at 1:25,000 and 1:5,000 scales, cadaster data and village borders, climate data, LPIS data, updated transportation axes and facilities (highways, village roads, railway maps and airports, etc.), updated stream, lake, pond, dam, water surfaces and irrigation maps, contour lines, CORINE data, water basins, agricultural basins, national parks, nature conservation areas, special environmental protection areas, protected areas, tourism areas, environmental pollution and drainage data, geology data, STATIP, etc., which are digitally approved, produced by and available at different institutions and organizations across the country will constitute the main data basis of the system (Ercaan. O., 2016).

6.2.2. Statistical Information

Population, health, education, general economy, agriculture, environment, industry, transportation, tourism data will be statistically collected at district, provincial, regional and national levels, and they will be used for decision making processes of planning.

6.2.3. National and regional reports

Academic studies related to agricultural sector; reports and research studies of the Ministry of Agriculture and Forestry; former State Planning Organization and current Ministry of Development reports, development plans and Regional Development Agency reports; environs plans; strategic plans of certain institutions such as Ministries and Governorates will be used as important documents throughout the planning activities.

6.2.4. National and international evaluation studies on agricultural economics

Academic studies, studies conducted, and reports prepared by the ministries as well as national and international studies will be important information sources for the planning process.

Within the scope of “Preparation of Agricultural Land Use Plans”;

- The obtained data will be analyzed, standardized and uploaded to the database, in which
- They will be classified at district, provincial, regional and national levels in a way to be used as contributive elements in preparation of the fundamental basis for the plan.

Furthermore, a relevant questionnaire for preparation of the fundamental basis for the plan will be designed which enables investigation of ecological, physical and functional relations in order to obtain area-specific information. This questionnaire will be published on the GDAR website to be completed by the personnel at local units of the GDAR whereby up-dated data will be made steadily available.

Findings obtained through this activity will be holistically elaborated and associated with functional and physical linkages at regional level in order to contribute to the preparation of fundamental basis for maps and reports of national agricultural land use plan and settlement pattern at 1/25,000 scale. Thus, the emphasis devoted to spatial evaluations will be highly considered in scope of conducted works.

6.3. Approach and Method

In relation to Agricultural Sector following works will be undertaken comprising Evaluation of the National SWOT Analysis and Preparation of the Productivity Matrix. Subsequently, Macro and Meso Zoning Activities (Spatial) will be carried out, which will help to identify Integrated Clusters based on Surface Structure and Relations (e.g.: identification of Identical/Homogenous Basins) Analyses.

Through socio-economic, natural, spatial and functional analyses and evaluations carried out in this approach, rational utilization of local resources will be thoroughly interrogated, which will enable a productivity and efficiency inquiry to be undertaken at provincial level.

Productivity inquiry will be carried out by investigating whether local resources pertaining to agriculturally relevant ecological structures are rationally utilized. This investigation will be based on findings of the analyses focused on legend components of 1/25,000 scaled maps as well as discrimination and harmonization of urban and rural (agricultural, non-agricultural, settlement and production) type of land uses within the provincial borders.

By looking at the ecological structures and land use within the provincial borders;

- Weak links in the production, distribution, consumption activity chains will be assessed, and
- Issues hindering productivity and efficiency of the system which cause low-potential use and even loss of resources will be identified and listed

in scope of productivity inquiry.

In the light of the analyses and evaluations conducted above, existing problems will be defined by referring particularly to current land use practices and location decisions. Thereafter, solid proposals regarding elimination of these problems will be offered for future developments, which will include rational location

selection decisions and land use plans with specific regard to local agricultural ecological structures.

These evaluations will be supplemented by Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis comprising spatial diagrams pertaining to natural, social, economic and built environments.

6.4. Classification of Data at Provincial Level

On one hand, activities will be conducted to figure out the current system at district and provincial levels, and on the other hand, macro evaluations will be carried out with available data at regional and national levels in order to achieve comparative and holistic evaluations in respect of priorities of the GDAR.

In scope of these activities to be undertaken at district and provincial levels, current situation analysis will be primarily conducted. In this respect, use and formation of natural and man-made environments as well as socio-economic situation will be revealed. Agricultural resources and production potential will be stated in detail. Current hierarchical settlement system and structure within the provincial borders will be analyzed in terms of current roles and functions of urban and rural centers particularly in agricultural production areas.

This study will also briefly refer to the macro level evaluations to be carried out at a higher scale for explanation of current agricultural production activities carried out national, regional, sub-regional levels as well as relationships between agricultural sector and other sectoral activities.

6.5. Evaluation of Data and Establishment of Information Infrastructure

Synthesis and reporting will be conducted for natural environment – natural structure, built environment – physical structure, social environment – service sector, economic environment - sectoral activities within the framework of spatial (protection-use pattern, agricultural ecological structures) analyses of the data collected.

Decisions and implementations in land use planning rely heavily on the identification of local resources for mobilization and threshold analyses for location identification. Land use decisions can mainly be distinguished between (Project on the Establishment of Macro Framework for Agricultural Land Use Plans in Thracian Provinces and Ergene Basin (2012); TR Ministry of Food, Agriculture and Livestock, General Directorate of Agricultural Reform, Ankara, Turkey);

- Built Up Areas and
- Absolute Protection Areas,

whereby those lying between these two can be identified as

- Areas to be both built up and protected in a balanced manner.

In built up areas; urban expansions of settlements will take place along with land requirement for industrial production as well as social and technical infrastructure services. Absolute protection areas; on the other hand, will comprise ecological production areas, particular vegetation areas, absolute agricultural production areas, irrigated agricultural production areas, natural conservation areas, etc., which have to be officially registered and legally restricted.

Preparation of criteria list for particular land use types, identification of specifications for protection in built up land use types as well as mechanisms for control and enforcement (plan provisions) are the necessary studies which have to be undertaken in order to be respectively applied for

- (i) Pre-dominantly built up and subsidiary protected areas,
- (ii) Equivalently protected and built up areas, and lastly
- (iii) Pre-dominantly protected and subsidiary built up areas.

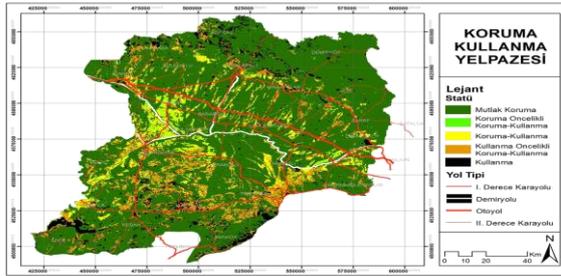


Fig. 2 Identification of absolute soil protection areas and built up areas

Areas where ecologically compliant agricultural activities are currently carried out will be identified in scope of surveys pertaining to agricultural-ecological structures. In the next step, impacts of natural structure components on each other and their interaction processes will be handled to the possible widest extent which the study allows.

Accordingly, 1/25,000 scaled maps and reports will be produced related to identification of agricultural-ecological structures and a set of activities will be prepared to provide firstly inputs for the protection of soil and agricultural resources; and secondly to define agricultural policies and develop connected planning activities (Landscape Plans, Master Plans, and Implementation Plans). This is of significant importance in terms of relying on integrity, functionality and sustainability principles in planning processes, which will constitute an important basis for preparation of potential land utilization maps.

After describing the protection-use pattern and identifying agricultural-ecological structures, functional relationship inquiries mainly including socio-economic evaluations will be conducted at district level. With the natural, built up, social and economic environment analyses, the following works will be accomplished:

- Identifying problems in production, distribution and consumption activity chains based on agricultural-ecological structures and current land use practices,
- Assessing agricultural - ecological potentialities and evaluation of rational use of resources,
- Undertaking macro evaluations on current agricultural production activities and clarification of relationships between agriculture and other sectoral activities,
- Investigating whether provided urban services increase production performances,

- Setting up a contextual framework for urban-rural integrated relations system (hierarchically positioned activity units in the reciprocal relations system).

Conducted studies and surveys as well as investigations and evaluations will be utilized for further assessments, which will be carried out within the framework of Strengths, Weaknesses, Opportunities and Threats (SWOT) analyses including spatial diagrams pertaining to natural, social, economic and built up environments.

6.6. Interpretations and Creation of a Model as Fundamental Basis for Land Use Plans

Land use plan basis will be completed upon definition of agricultural status of the concerned land (classification of the area based on resource features), identification of agricultural functions (classification of the area based on activities) and finalization of legends (contents, colors and symbols) as planning aids.

After describing the protection-use pattern and identifying agricultural-ecological structures, functional relationship inquiries including mainly socio-economic evaluations will be conducted at district level.

"Potential Land Use Maps" at 1/25,000 scale will be prepared at district and provincial levels by using all analyses carried out for natural and built up environments and all data layers included in the "Spatial Data Model" which constitute the fundamental basis of the land use plan. Thereupon, the "Model Proposal" on the development of agricultural sector and its integration with other economic and social activity sectors will be developed at provincial level.

The "Model Proposal" will be developed in a way to include all basic contents for agricultural production policies related to local agricultural-ecological structures as well as measures and incentive packages for local activities along with location selection decisions to be made in this regard. In the reports to be prepared at provincial level, current situation analyses will be carried out focused on;

- Natural structure,
- Physical structure,
- Spatial structure,
- Population and demographic characteristics,
- General economic situation,
- Socio-economic structure,
- Land existence in the districts,
- Agricultural products and production processes,
- Animal products and production processes,
- Water resources and irrigation systems,
- Mechanization in agriculture,
- Agricultural problems and risks,
- Agricultural investment projects and subsidies,
- Agricultural holdings,
- Agricultural organizations, and
- Agricultural structure assessments, etc.

In light of syntheses of above-mentioned analyses as well as evaluations and interpretations, pertinent specifications will be set forth for;

- Landscape plans,
- Non-agricultural requirements, and

- Protection - use pattern,

which are essential for agricultural land use planning. Thereupon, the relationships between agricultural subventions and agricultural production processes will be evaluated and formation of a fundamental basis for preparation of the agricultural land use plans will be achieved.

6.7. Iterative Compliance Investigation of Proposed Model for Land Use Plan Basis

The proposed model will be iteratively evaluated by the experts from the ministries, local interest groups and academicians who are effective in regional evaluations and their feedbacks will be obtained.

Furthermore, the proposed model will be compared with National Plans, Environ Plans, Basin Plans, Regional Plans, Sectoral / Development Plans and its suitability will be steadily investigated.

Contributions regarding land use and location selection decisions will include features pertaining to activating the processes related to utilization of local agricultural resources and ecological structures as well as to establishing and strengthening regional functional and physical (production-added value-transfer-marketing-consumption) linkages.

6.8. Identification of Compliant and Conflicting Parts of the Model with Current Plans

Conflicting elements will be identified as a result of comparison of the proposed model with National Plans, Environ Plans, Basin Plans, Regional Plans and Sectoral / Development Plans. Based on the outputs of comparative studies, thematic research proposals will be made in order to identify institutional mechanisms to be established in connection with management and governance operations for harmonization purposes. These efforts are for firstly for assessment of conflicts and secondly for their elimination with aid of adequate measures and actions.

6.9. Preparation of the Model Related LUP Basis at National and Regional Levels

Land Use Planning basis will be produced at national and regional levels which relies on;

- Identifying the protection - use pattern through Absolute Protection, Use, Conditions and Significance Rating (Usage with Protection Priority, Protection-Use Balance, Protection with Usage Priority) decisions,
- Integrating the functional and physical linkages (Production - Added Value-Marketing-Consumption) for creating macro, meso and micro level agricultural ecological zoning and relations system, and
- Ensuring the connection among ecologically, statistically and administratively defined spatial clusters.

Thus, the processes of producing a well elaborated Agricultural Land Use Plan at 1/25,000 scale in accordance with its priorities and implementation tools (political, legal, administrative, financial, technical, educational, etc.) will be identified.

6.10. Description of Macro Agricultural Policies and Tools in line with LUP Basis Prepared at National and Regional Levels

Upon preparation of the fundamental basis of the Land Use Plan, agricultural policies will be identified with due regard to ecological, economic and social sustainability principles. Subsequently, macro agricultural preferences and policy tools such as support and subsidy mechanisms; research studies, extension and training programs; as well as export and import regulations will be described in the final synthesis of accomplished works.

7. CONCLUSION

The mission line required by the duty of producing agricultural land use plans, which are assigned to the Ministry of Agriculture and Forestry by the Soil Protection and Land Use Law No. 5403; Drawing on the basis of internal and inter-institutional cooperation, communication, sharing and governance will be an important step towards fulfilling the requirements of planning, functionality, rationality, sustainability and integrity. It is deemed necessary to base the agricultural land use planning process on such a mission, to be among the actors currently active in planning in the country, and to play an active role in filling the gaps in the planning studies being carried out.

The physical plan (1/25,000 scaled Settlement Pattern and Land Use Plan) model proposal for land use planning is summarized in stages below. Operation steps of the proposed model are composed of;

- 1) Collection of spatial, institutional, scientific and statistical data and their transfer to a database,
- 2) Identification of main structural indicators (natural structure, settlement pattern demography, socio-economic structure),
- 3) Identification of functional indicators (agricultural product profiles, specialization),
- 4) Selection of indicators (technical infrastructure and thresholds),
- 5) Identification characters and types (spatial and functional clusters),
- 6) Definition of pre-planning proposals (links between clusters),
- 7) Undertaking suitability analysis in location selection,
- 8) Definition of final planning proposals,
- 9) Establishing links between clusters and action areas (local coherences – functional associations),
- 10) Undertaking location selection decisions (protection-use pattern), and
- 11) Preparing the physical plan (land use plan and settlement pattern at 1:25,000 scale).

Continuing the Land Use Planning project development activities initiated by the GDAR in 2011 is an indispensable task in terms of protecting economy-ecology balance, saving absolute agricultural areas from occupation and achieving sustainable environment as well as fulfilling the legal obligations entrusted to the GDAR.

The proposed fit for purpose agricultural land use planning model can be easily implemented within the framework of the United Nations Sustainable Development Goals, especially in developing countries.

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