

The Concept of “forest” in forestry education as a: reference to renewable socio-economic Resource (RSeR)

An interregional curricular comparative study

Dr. Mohamad CHEIKHO

Faculty of Education
Damascus University
Syria

Abstract

The Concept of “Forest” has often been reduced through education into mere a group of trees; whereas a forest, as an ecosystem, is much more complex than that. This research supposes that curricula should reflect societies’ needs and lifestyles which generate the fundamental philosophy of different fields of education.

Along with this framework, this paper tries to highlight the role played by the regional factor in the incorporation of the concept of “forest” as a reference to renewable socio-economic resource (RSeR) in forestry curricula.

Two regional contexts were considered through this paper: the European and the Near-eastern from which nine national forestry curricula had been analyzed. The identification of the involvement’ level of humans and socials sciences and the characteristic “forest” of each curriculum were the additional objectives of this analysis.

This paper concludes that the concept of the “forest” as a reference to RSeR is almost not realized through the existing forestry curricula. Furthermore, the referential forest model in forestry education is deeply affected by the traditional regional practices where each society has its specific model of “forest”.

I. Introduction:

Educational institutions are continually faced with by a big challenge; they frequently try to update their curricula to cope with the multidimensional expansion of human knowledge and with new technologies. The educational process in forestry sector represents a typical example of this situation.

In general education, "Forest" was often been taught to learners as an ecosystem in which flora, fauna and non-living organisms such as soil and water are tightly and dynamically interconnected, but traditionally, this connotation of forest is no longer adopted in forestry sector. For forest engineers, a forest is best defined as an area with a high density of trees, or as an ecosystem or an assemblage of ecosystems dominated by trees and other woody vegetation. Accordingly, their efforts in forest management are mainly focused on wood-trees breeding and wood production. Indeed, forest is still considered in forestry sector as a large wooded area with a thick growth of trees and plants.

During the last century and often on account of several reasons and factors: intensive human activities, over-exploitation of forests, forest fires, intensive grazing, soils degradation, etc., the forests and the natural ecosystems in different regions of the world have been severely modified. Concurrently, forestry sector has known an important methodical and technical progress, such as the making use of remote sensing systems and GIS applications, etc.

In forestry education, learners are typically taught basic and applied forestry sciences. The main purpose of such educative system is supposed enabling learners to apply their technical knowledge to manage practical problems and to rejoin social demands and needs.

However, at the end of their training program, these new foresters (ex-learners) should be able to deal with the real-world' affairs throughout the forest' model they have acquired and assimilated, but unfortunately, the real-world' problems surpass their very simplistic model of "forest". In fact, their concept of "forest" excludes the human factor and other values such as the role of the forest as a renewable natural resource. Thus, they encountered by some difficulties when they deal with socio-economic dimensions of forest. According to Brown (2003), traditional foresters implicitly believed that as professionals they had the right to resolve value conflicts on behalf of, and often without reference to, society.

II. Conceptual background

II-1. Historical context of European and Near-Eastern natural milieu:

For better understanding and interpretation of the plausible outputs of this research, it will be necessary to highlight some historical elements about European and Near-eastern forests and to have an epistemological view of forestry.

The history of the European and the Near-eastern forests can somehow help in understanding some features of the current situation of forestry sector. Concerning human natural history, it is not an exaggeration to say that the Near-east region is the cradle of humanity; it represents one of the oldest human habitations on the planet. The agricultural traditions in this region go up to about 9500 years ago; the period during which the wheat had been known and cultivated. During the 7th millennium BC other crops had been domesticated such as the barley, the chickpea and the lentil. At the same period several animal species had been domesticated such as the dog (14000 BC), the goat (7500 BC), the pork (7200 BC), the sheep (7000 BC), the bovine (6400 BC) and the donkey (3500 BC) (Mazoyer & Roudart 1998).

A big part of the Near-eastern' forests had been destroyed through the expansion of agricultural practices and other human activities; the practice of forests cutting had begun in 3500 BC. Cheikho (1993) mentioned that through the last millennium, northern forests of Syria were the subject of eleven successive military invasions; accordingly, and on account of the use of fire in wars, forests were strongly degraded. However, these kind of human' activities had been known in Europe only in 200 BC. Thus, the European forest was not as damaged as the Near-eastern neither in quality nor in quantity.

Indeed, the forestry European patrimony is undoubtedly more abounding than that of the Near-eastern; at the beginning of the last millennium the forests in Europe were still unhurt. Through the Middle-Ages, according to Demard (1980), various types of wood use appeared in Europe. These uses had given to forests an important socio-economic dimension. Pardé (1999) has mentioned that between 802 and 813 Charlemagne had put up, in Western and central Europe, the first administration of forest and even the invention of the name of "forester".

As a science, forestry is relatively recent. Pioneers of forestry mentioned by Parade¹ have been all known after 1600, such as: Réaumur (1683-1757), Buffon (1707-1782), Duhamel du Monceau (1700-1782), and Varenne de Fenille (1730-1794). Parade considered them as precursors in forestry; they established the basic principles of silviculture and forest economy;

*"The forest economy includes the necessary knowledge for the best administration of forest, vis-à-vis private sector' interests in particular and for national population in general.... Supporting the production, the natural regeneration and the progressive improvement represents the goal of the wood' culture (A. Parade - 1ere edition, 1837)"*²

Thus, forestry education in Europe is deeply attached to traditional forestry practices. In contrast and due to its forest' situation, the Near eastern region had not developed an equivalent forestry practices; therefore, the socio-economic dimension of forest is not deep-rooted in Near-eastern countries forestry traditions.

¹ - In Pardé (1999).

² - Ibid.

II-2. “Natural Milieu” as an alternative connotation of “Forest”

Terminologically, the term “forest” represents itself an ambiguous subject matter. Unfortunately, the forestry sector has not known yet a consensus concerning the definition of forest. Lund (2009)³ has mentioned the existence of more than 890 definitions; each one of these definitions is based on particular criteria. For instance, general English dictionaries such as “The American Heritage Dictionary of the English Language” defines the term “forest” as “a dense growth of trees, plants, and underbrush covering a large area.” Whereas, the Food and Agriculture Organization FAO (1958) defines the forest as “all lands bearing a vegetative association dominated by tree of any size, exploited or not, capable of producing wood or other products, for exerting an influence on climate or on the water regime, or providing shelter for live stock and wild life”⁴

The term of “forest” was historically represented in education and in some educational publications such as that of Giordan and Souchon (1994) through a simplistic model which contains three main elements: trees, wildlife and soil. At social level speaking, this model provokes several socio-economic conflicts. A forester is interested in the exploitation of the first element which is trees; his role is limited to produce wood for industry, so he does not care for the two other elements. On the contrary, a hunter is interested in the wildlife; for him the tree represents the habitat for this wildlife, so he is against wood harvesting activities.

The adoption of this above-mentioned simplistic model of forest through different educational systems has reduced, for learners, the possibility of being more open-minded about the concept of “forest”. Therefore, one can say that the concept of “forest”, as understood via the above-mentioned model, has no one objective meaning; it is more literary than technical or scientific one. To be exact, the term “forest” could be a holder of several meaning at the same time. That is to say, the significance of the term “forest” is unstable; it is changeable according to users or stakeholders: their educational backgrounds and accordingly their manners of thinking.

The educational implementation of this model in forestry, as a field of knowledge, has led to a kind of a mono-disciplinary teaching-learning process, and thus the concept of forest as a renewable resource is used for an era completely absent. J Von Uexküll stated in 1934 that:

*“ Precisely and objectively, a definition of forest, as a milieu, does not exist: there is a forest for the forester, a forest for the hunter, a forest for the botanist, a forest for the walker, a forest for the friend of nature, a forest for collectors of brushwood and fruits for domestic uses or a forest for those who pick the aromatic leaves of bay, a forest of fable where Tom Thumb was lost ”*⁵.

³ - In Lund (2009)

⁴ - http://www.dse.de/zellandinfo/pas/tk247_lup_eth/forest_inventory.pdf. In Lund (2009)

⁵ - In Cheikho et Clément (2002)

Thus, the term “forest” is linguistically a popular expression without a common definition or widespread understanding; it symbolizes a polyvalent signifier (Figure 1).

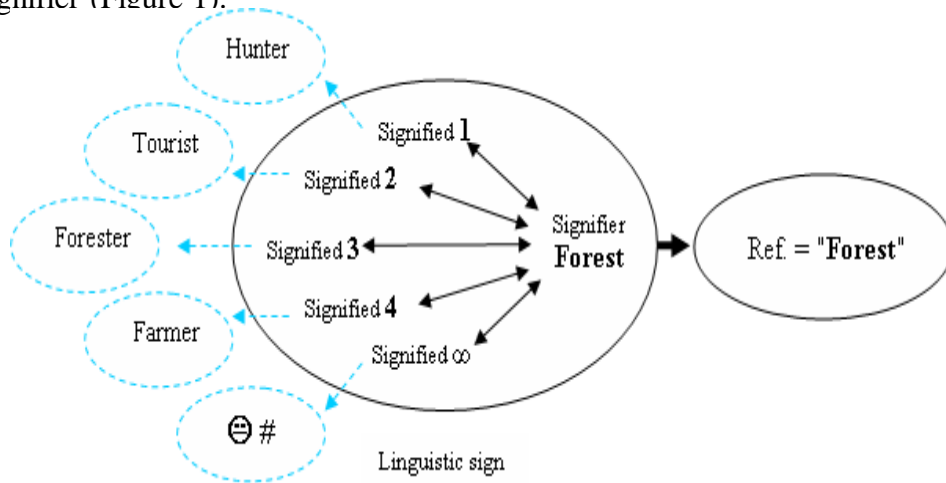


Figure 1– Several meanings for one signifier

This polyvalency, which was clearly shown through several research works (Cheikho, Clément, 2002; Cheikho, Clément & Bariteau, 1999), generates for forest managers, besides to their technical work, a lot of extra tasks concerning the quotidian stakeholders’ conflicts to which they are asked find resolutions. But unfortunately, these conflicts could not be resolved through the above-mentioned simplistic model of forest.

Through an analysis of different forest stakeholders conceptions about the term of “forest”, Cheikho demonstrated in 2002 that each stakeholder his own and specific view of the forest. The concept-map achieved for each one of them revealed that their conceptions of forest always contain five common elements: Plant, Animal, Soil, Man and their Interactions. These five elements’ presence percentages are not similar; they vary according to stakeholder and his background.

In contrast to the forest ecosystem’ model carried out by other educationists such as Giordan and Souchon (1994), the concept of “forest” performed by Cheikho considers the “Man” as an intrinsic constitutive element with reference to the natural milieu (the forest). This new vision of the forest gives to this model not only its originality compared to others, but also validates it as a reference for environmental and forestry education.

Furthermore, it is important to remember here that educational systems should reflect their societies’s needs. According to Durkheim (1922), there are as many education systems as different social backgrounds. "Each society has its specific education system which represents it as well as its moral organization, political and religious "6. This belief could also be seen in agricultural and forestry’ literature; Simonneaux (1999) noticed that teachers of technology, in agricultural education systems, believe that their

6 - in Durkheim (1922/1973)

professional identity is troubled by the changes in the rural world. Thus, the existence and the durability of any career are strongly influenced by the socio-economic circumstances. Accordingly, social needs impose, to some extent, the type of training and the curriculum contents of this or that career. Once more, educationists in forestry sector find themselves unavoidably forced to rethinking their traditional forest model.

The concept of "natural milieu" was proposed in 2001 during a colloquium on "Formation, Research and Sensitizing"; this colloquium was organized by the International Association for Mediterranean Forest in France (AIFM). The objective of this proposition was not only to take into account the specificities of forests and their regional needs, but also to make forestry knowledge as available and as serviceable for the widest public as possible. Thus forestry education could be extended to reach other audiences and sectors: teaching programs in primary and secondary school, public sensitizing activities, etc. In addition, the term "natural milieu" is considered vital to support an effective incorporation of other terms in natural resources management such as: "sustainability", "renewable natural resources", "participatory approach", "multiple-use-territories" and "integrated management".

Indeed, talking about the "natural milieu" as an alternative concept of the term "forest" in forestry implies unavoidably the consideration of this ecosystem as a renewable socio-economic resource (RSeR). Accordingly, forestry curricula are supposed to contain some courses related to human and social sciences. Therefore, this research gives a particular attention to the inspection of the position given to human and social sciences throughout forestry curricula.

II-3. New concepts in forestry education:

On account of the complexity of the term "natural milieu", forestry education' experts find themselves in front of the challenge of curricular development; they are asked to find issues that help learners to be in harmony with the real circumstances and the fieldwork complexity. At present, forests are not only wood producers and the foresters' task is not simply the wood harvesting. In addition to their traditional technical knowledge, foresters have to acquire extra skills such as the environmental, the socio-economic and the administrative, etc.

Considering the new facts and changes that have come about in forestry sector in addition to global and local development needs, several forestry education institutions have to bring in some modifications to their curricula. Consequently, some new terms and notions have to appear in the reviewed curricula. Some of these notions were developed to form an entire course such as agroforestry, pastoralism, biodiversity, ecotourism, non-wood forest products, forest recreation and urban forestry, non-market forest services, integrated management of land resources, rural development, etc.

Some other terms and notions are presented in the new curricula as indicators to elucidate a new representation of the concept of "forest". For example, the making use of some terms such as "genetic resources",

“diversity and stability” and “sustainability” translates not only an environmental ethic but also a new ecological trend concerning the future human generations’ life on the planet. The adoption of others notions such as “renewable natural resources”, “participatory approach” and “multiple-use-territories” highlights the importance given to the socio-economic dimension of forests. This last dimension was unfortunately almost neglected in previous curricula in most forestry education systems (Cheikho 2005, 2002).

To sum up, a good implementation of durability logic in forestry education necessitates some reformative actions; forestry curricula should contain specific socio-economic sequences as well as the concept of “forest” should consider ecological, wilderness, wildlife and cultural values as a whole.

III. Research context and methodology:

Two regional contexts were identified to be studied all through this paper: the European and the Near-eastern. This choice could be justified not only by the fact that both regions are partners with reference to Mediterranean forest, but also by the existence of multilateral regional initiatives for collaboration concerning several topics such as forest-fire fighting, watershed management, wildlife conservation, etc.

The collaboration between European and Near-eastern countries has taken several forms: technical assistance, training, seminar participation, scientific cooperation and technical exchanges. Furthermore, these countries have developed mutual educational projects and programmes such as the European Union’s programme “Tempus” which was extended to support the modernization of higher education through university cooperation projects within Mediterranean countries: Algeria, Egypt, Jordan, Lebanon, Morocco, the Palestinian Authority, Syria, and Tunisia.

III-1. Research purposes:

The importance of this research resides in the necessity of an urgent international action to deal with the more recent worldwide pervasive challenges such as the climate change disasters, the global food crisis, etc. Currently, the local or national individual action will not be sufficient to deal with global menace of human future on the planet. Didactically speaking, the educational confrontation of this situation will require the unification of different national or regional efforts in the targeted field.

The harmonizing of educational curricula with interdisciplinary, multinational and global approaches will gradually enable the new generation of foresters to deal more correctly with the current situation of forests in the world, and to consider these forests as RSeRs. This situation stimulates the questioning about the current state of affairs concerning forestry curricula in different geographic regions.

This interregional curricular comparative research aims mainly to identify the status of human and social sciences in these different forestry curricula. Accordingly, the problematic question of this research could be formulated as follows:

What importance is given to the concept of “forest” in forestry education as a reference to RSeR in two regional Forestry curricula?

To answer this question, the present research will first try answer the following detailed questions:

- *With reference to disciplinary fields, what identities could be attributed to the regional factor?*
- *What is the involvement' level of human and social sciences in each curriculum?*
- *What are the regional differences concerning the "characteristic forest"?*
- *What are the implications of disciplinary fields and characteristic forests for the incorporation of the concept "forest", as a reference to RSeR, in forestry curricula?*

III-2. Methods:

To answer the research questions, a disciplinary frame of content analysis was put up in order to quantitatively and qualitatively classify the courses of each curriculum into one of the four identified categories, (Table 1): Fundamental Sciences (FS), Fundamental Natural Sciences (FNS), Applied Sciences (AS) and finally Human and Social Sciences (HSS).

Table 1 – The analytical frame of disciplinary content analysis.

Disciplinary fields (courses)	Total	%
Fundamental Sciences		
Fundamental Natural Sciences		
Applied Sciences		
Human and Social Sciences		

The analytical frame which was adopted in this paper for the conceptualization of regional characteristic forests is the same method elaborated by Cheikho (2002). The logic of this analytical method relies on the fact that the whole is not only equivalent to the sum, but it is the sum of its components and to their interrelationships. Therefore, the contents of different forestry curricula were classified, in function of their learning objectives, within five categories; these represent systematically the five common constitutive elements of each forest: Plant, Animal, Soil, Man and their Interactions (Table 2).

Table 2 – The analytical frame of regional forest.

Element Country	Man	Plant	Animal	Soil	Interactions
Courses contents					
Total					
%					

Accordingly, two types of content analysis have been carried on the current curricula of nine forestry educational institutions belonging to nine different countries as representatives of two regional contexts: the European and the Near-eastern (Table 3). These curricula were randomly chosen after considering two main criterions; the similarity of specialization, the equality of study duration.

Table 3 – The forestry institution on which the curricula content analysis were applied

Bosnia and Herzegovina: Faculty of Forestry, University of Banja Luka
France: National School for rural Engineering, Water and Forests (ENGREF), Nancy
Iran: Faculty of Natural Resources College of Forestry, University of Tehran
Italy: Forestry Science and Ecology, Faculty of Agriculture, University of Bari
Spain: Forestry School, Ciudad University of Madrid
Sudan: Faculty of forestry, University of Khartoum
Syria: Department of forestry, Faculty of Agriculture, University of Aleppo
Turkey: Faculty of Forestry, Universities of Turkey
U.K.: School of Agricultural & Forest Sciences, University of Wales

The inter-reliability of rater was established through carrying out two intervallic content analyses of the whole curricula by the researcher himself; this repetitive work was necessary to insure the consistency of analytical procedures. Both qualitative content analyses outputs were mutually compared to ensure the stability of textual results before their transformation into the needed quantitative data for the implementation of quantitative analysis.

The next step of this analytical process is to quantify the obtained data according to disciplinary fields. To satisfy the needs of this research, the quantification outputs were statistically analyzed by using the software “SYSTAT 8.0” (SPSS Products).

IV. Results discussion and synthesis :

IV-1. Regional factor:

With reference to disciplinary fields, what identities could be attributed to the regional factor?

In this paper, it could be reasonable to say that calculated correlation coefficient (r) values which surpass $(0.765)^7$ are highly significant. The correlation test of the content analysis output relatively gives the regional factor a significant value. In fact, the regional factor plays an important role in the identification of two major types of curricula; the correlation' values were often higher among the regional curricula compared to those of the bi-regional ones (Table 4).

Table 4 – Correlation test' values

	France	U.K	Bosnia	Italy	Spain	Turkey	Syria	Iran	Sudan
France	1								
U. K.	0.741	1							

⁷ - The tabulated (r) values at significance levels ($p = 0.01$) for 8 degrees of freedom. In Al Najjar & Gazal (1990), p. 372

Bosnia	0.405	0.909	1						
Italy	0.386	0.452	0.279	1					
Spain	-0.089	0.582	0.814	0.413	1				
Turkey	0.321	0.757	0.771	0.790	0.849	1			
Syria	0.153	0.518	0.520	0.903	0.754	0.942	1		
Iran	-0.144	0.495	0.708	0.533	0.980	0.875	0.843	1	
Sudan	0.683	0.828	0.650	0.871	0.533	0.891	0.825	0.560	1

Accordingly, it could be reasonable to say that there are several groupings of similar national forestry curricula; for example, the U.K. forestry curriculum compared to those of Bosnia ($r=0.909$) and Sudan ($r=0.828$). The high correlation values which appears between the U.K. and Sudan, two countries from the two different regions, are not a paradoxical case; this similarity is due not only for the reason that all the analyzed curricula represent the same field of knowledge which is the forestry, but also on account of probable particular bi-regional historical or cultural relationships.

IV-2. Regional factor with reference to disciplinary fields

What is the involvement' level of humans and socials sciences in each curriculum?

In fact, the evident divergence between the two studied regional curricula comes into view through the assessment of their assimilation rates of the four disciplinary fields: fundamental sciences, fundamental natural sciences, applied sciences and finally human and social sciences.

Generally and undoubtedly, the actual curricula give less importance to the human and social sciences in comparison with fundamental sciences (both the fundamental sciences and the fundamental natural sciences) and the applied sciences (Figure 2).

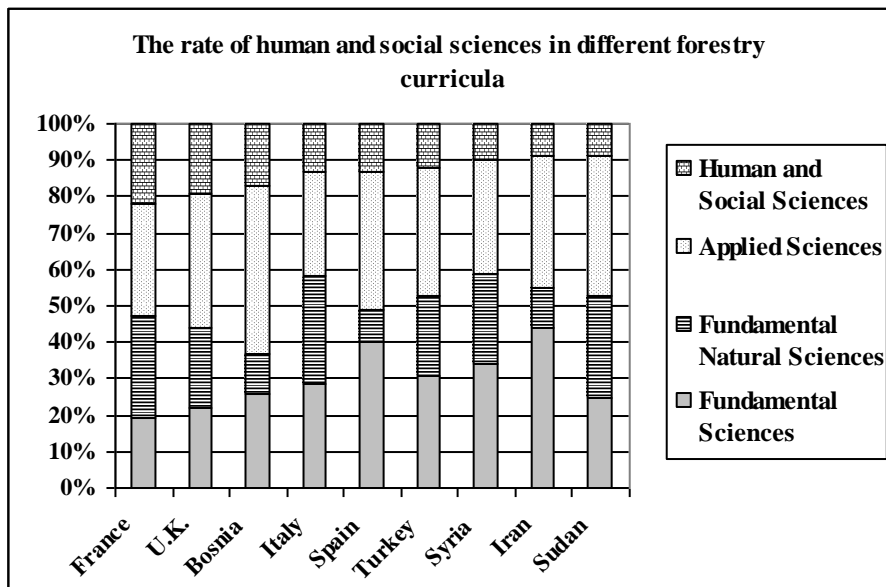


Figure 2 - Human and social sciences compared to other disciplinary fields.

Anyway, this result is not unexpected; in fact, the analyzed curricula reflect strictly the traditional model of the “forest” illustrated by Giordan & Souchon (1994) which still dominates the educational philosophy in forestry institutions. This point could be explained by the fact that for a long time a forester was traditionally seen as technical, and the main part of the forest he is interested in, especially in the Near-eastern countries, is trees.

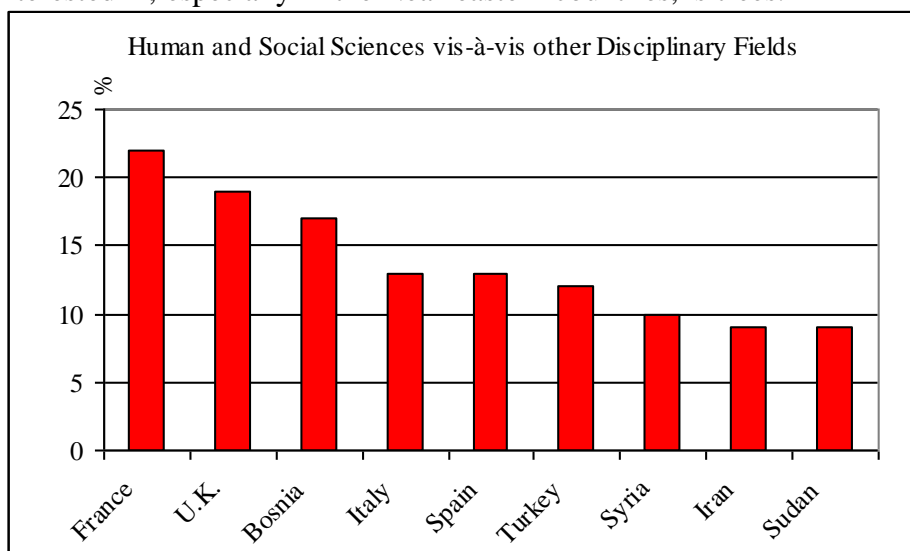


Figure 3 – The rate of human and social sciences in different forestry curricula

In fact, the implication rate of human and social sciences in the compared forestry curricula played a decisive role in the identification of these two

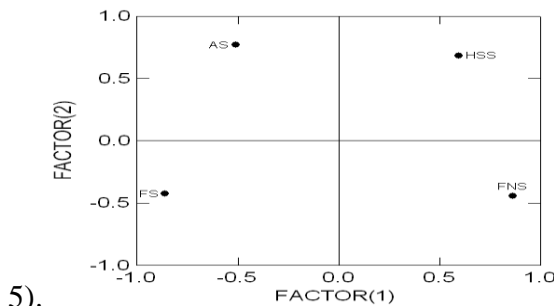
regional contexts (Figure 3). The content analysis albeit illustrates an evident differentiation between two regional contexts vis-à-vis human and social sciences; the results of analysis show, as well, a kind of categorization, where one can distinguish between two remarkably different categories of countries regarding the rate of human and social sciences in their curricula.

On the one hand, five European countries: the United Kingdom (U.K.), France, Spain, Italy, Bosnia and Herzegovina had more than 13 % of courses related to human and social sciences; on the other hand, a group containing four Near-eastern countries: Turkey, Syria, Iran and Sudan had less than 12 % of courses related to human and social sciences.

This result gives, once again, the regional factor a significant importance. It also gives an indicator about trends towards considering “or ignoring” the forest as an RSeR through these curricula. So, it could be reasonable to say that the regional factor has, to some extent, an impact on the identification and the elaboration of forestry curricula contents.

IV-3. Factors correspondence analysis of both issues “disciplinary fields and regional factor”

For a better comprehension of the position of each analyzed curriculum regarding the four disciplinary fields, particularly the field of human and social sciences, the same data was statistically retreated by using factor correspondence analysis. (Figure 4 &



5).

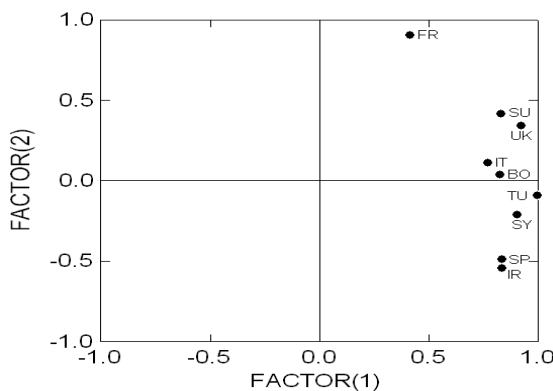
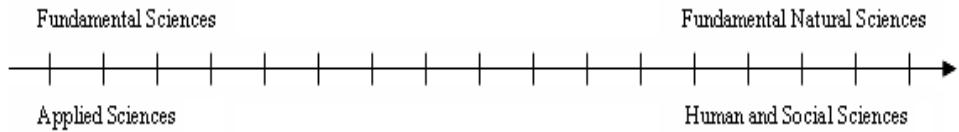
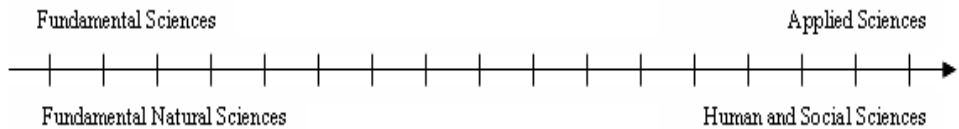


Figure (4 & 5) – Factor map of both disciplinary and regional fields. The factors correspondence analysis showed two main axes or factors:

The first (Factor 1) represents horizontally an increasing gradual scale from the field of fundamental sciences to the field of fundamental natural sciences, and from the field of applied sciences to the field of human and social sciences.



The second (Factor 2) represents vertically an increasing gradual scale from the field of fundamental sciences to the field of applied sciences, and from the field of fundamental natural sciences to the field of human and social sciences.



The factors correspondence analysis indicates that the analyzed forestry curricula are located in the dominance zone of factor 2; that is, between the field of Fundamental Natural Sciences and the field of Human and Social Sciences.

The distribution of national curricula on the factors map ensures, to some extent, the results obtained through the above-mentioned correlation test. The factors map could also provide an interpretation of the presence of the high correlation coefficient which could appear among different national curricula, such as those of France and the U.K. The factor correspondence analysis indicates that they are both closely situated in the zone of Human and Social Sciences. A similar situation could also be observed in the case of the U.K. and Sudan. In contrast, the high correlation coefficient between Syrian and Turkish curricula could be explained through the neighboring placement of each of them in the zone of Fundamental Natural Sciences dominance.

This categorization was also ensured throughout a hierarchical clustering of the same matrix of data, (Figure 6).

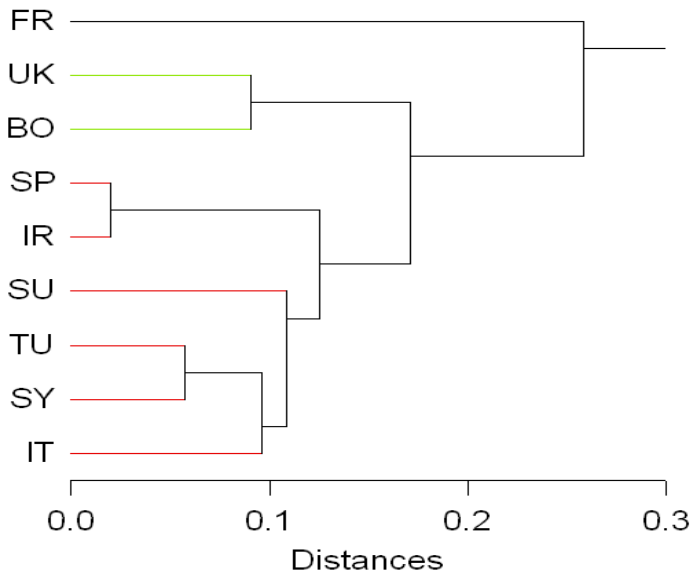


Figure (6) –The hierarchical clustering of the matrix of data.

This clustering shows, for example, three groups at 15 % of distance: the first is represented by the French forestry curriculum, the second contains those of the United Kingdom (U.K.) and Bosnia & Herzegovina, and the third envelops the four Near-eastern countries: Turkey, Syria, Iran, Sudan, Spain and Italy, thus enclosing four Mediterranean countries. This last group reflects the geographic position influence.

IV-4. Regional forest conceptualization

What are the regional differences concerning the “characteristic forest”?

The analytical study outputs of forestry courses reveal various types of “forest” connotation. In fact, each country has a particular understanding of the concept “forest”; this understanding, which is almost a local communal product, reflects the backgrounds of forestry educational institutions and the social needs of their countries. That is exactly what, through this article, the term “characteristic forest” connotes.

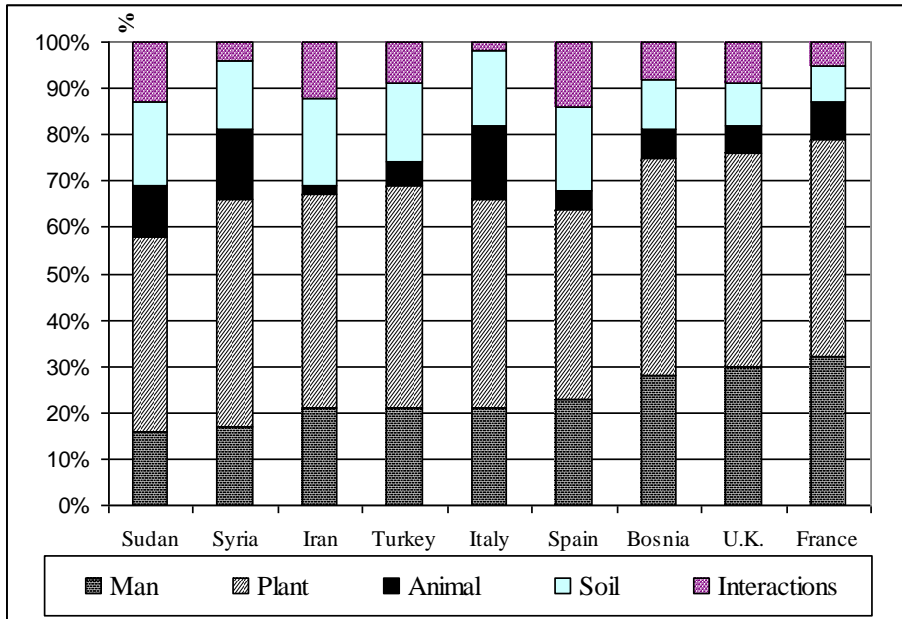


Figure (7) – National characteristic forest.

According to the presence level of each one of the above-mentioned five forest constitutive elements in forestry courses, nine national models of forest were identified (Figure 7).

Obviously, the “Plant” as a forest constitutive element, occupies the first position in all analyzed curricula; it represents the principal constituent around which the conceptualization of forest was, for each curriculum, built through gathering the remaining four constitutive elements as supplementary parts. With 89 % of analyzed national curricula, the constitutive element “Man” comes in the second position. In conjunction with the present result, it is important to mention that the sum of both elements “Plant” and “Man” presence percentage is situated between 58 % as the lower value in the characteristic forest of Sudan and 79 % as the higher value in the characteristic forest of France. That is to say, the three remaining constitutive elements were only represented as (21 to 62) % of presence percentage.

89 % of the different national characteristic forests present the “Soil”, which is logically the cradle of any forest, in the third position, and they rank the element “Interactions among the other forest constitutive elements” in the fourth position. And finally 56 % of analyzed curricula rank with the smallest presence percentages, and the element “Animal” in the fifth position.

The above-mentioned quantification could be didactically translated into a concept of forest which connotes only the presence of the constitutive element “Plant” as a source of wood (trees) and the constitutive element “Man” as exploiter of this wood.

Explicitly, in most analyzed forestry curricula, the main objective of courses components such as modules of theory and practical knowledge and skills which relate to the “Man” is to enable future forest engineers to be good exploiters of trees and trees only; whereas, there are only few modules related to the socio-economic features of forest. Furthermore, teaching modules about soil and animals is still a complementary component but not an essentially one. This could also be concluded through the slight presence level of the element “Interactions”. This last statement constitutes a missing element in the synthetic approach in “forest” connotation for all analyzed national forestry curricula.

IV-5. Regional “characteristic forest”

The fact that both the Near-eastern and the European models of forest show, to some extent, similarity through focusing on the element “Plant”, and slightly, on the element “Man”, does not mean, in any way, that there are no differences between the two regional connotation of “forest”, (Figure 8). Actually, this moderate resemblance could be justified by the existence of a semi-agreement at international academic level concerning the curricula content of forestry education sector.

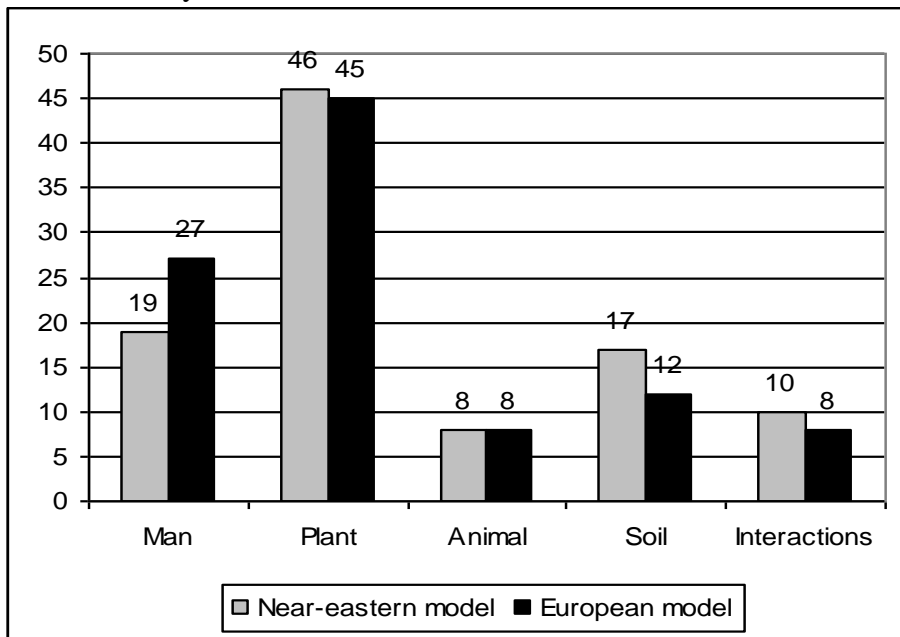


Figure (8) – Regional characteristic forest

The figure (8) shows that, compared to the European, the Near-eastern forestry curricula contain more courses in relation to the elements “Plant, Soil and Interactions”; whereas, the European contain more courses in relation to the element “Man” only. Actually, these differences are sufficient to evoke two concepts or models of “forest”: the Near-eastern which is

moderately more natural-scientist and the European which is relatively more socio-economist.

Anyway, this result could show that the European models of "forest" is closer to the connotation of "forest" as an RSeR compared to the Near-eastern, but this statement is not sufficient at all to induct that the European models of "forest" could represent the real meaning of "forest" as an RSeR. The real meaning should reflect the logic of the durability as adjacent to the implication of all constitutive elements of the system "forest" adequately within a well-built curricular framework. It also necessitates the taking into account of forestry stakeholders and local social needs.

The hierarchical clustering of national context shows three groups at 0.25% of distance: the first represents the Italian and the Syrian forestry curricula, the second contains those of Sudan, Turkey, Iran and Spain, and the third includes those of Bosnia & Herzegovina, U.K., and France. In fact, the hierarchical clustering identified three types of "forest" model, (Figure9); these models reveal that, besides to the regional factor, the national context could play an important role in the conceptualization of forest.

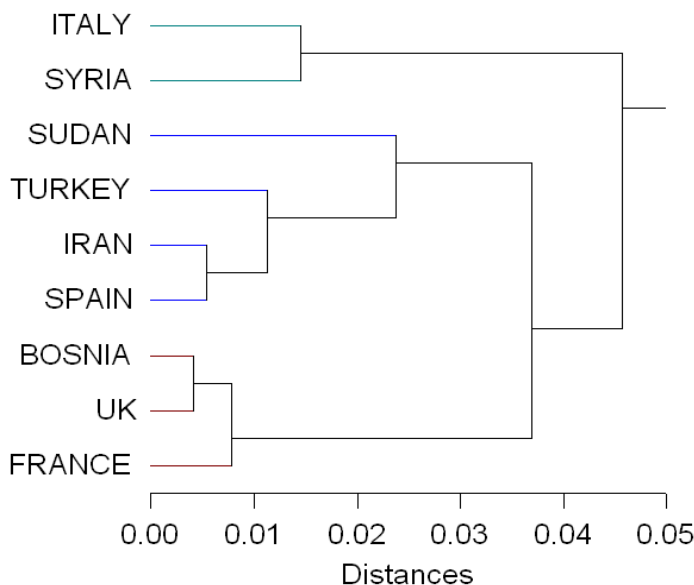


Figure (9) –The hierarchical clustering of the matrix of data of national context.

With reference to the three groups which were obtained according to the presence of the five constitutive elements within the analyzed curricula, the hierarchical clustering shows that the categorization logic could be principally interpreted through the presence rate of the element "Man" compared to other constitutive elements on the one hand, and the presence rate of the element "Plant" on the other (Figure 10).

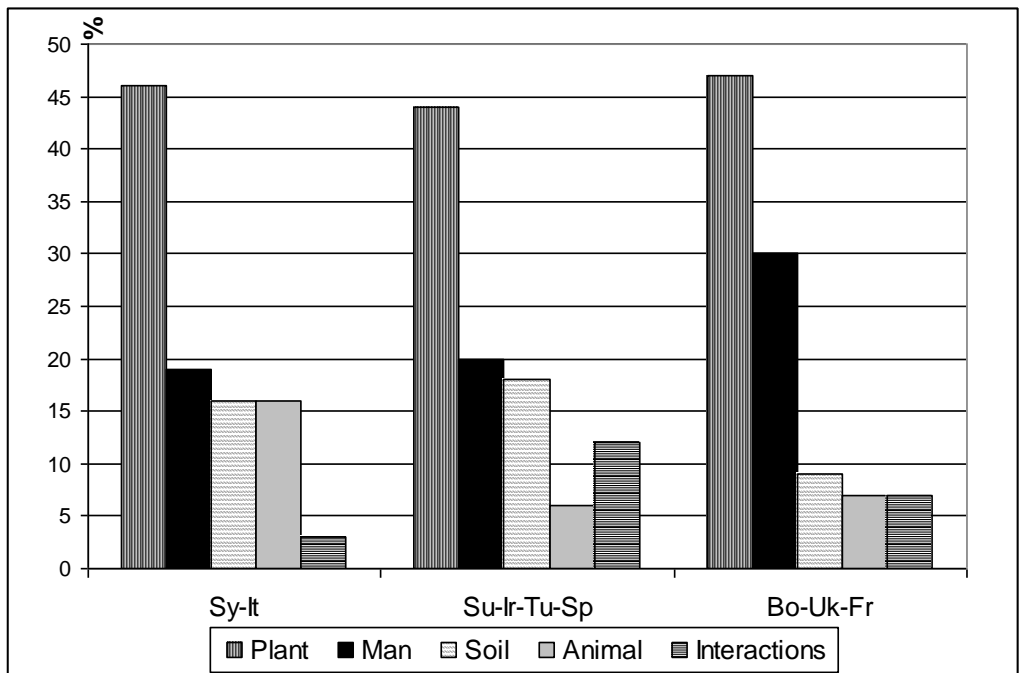


Figure 10 – The three obtained groups according to constitutive elements presence.

Consequently, the three identified models of “forest” could be described as follows:

1. Natural-scientist “forest”: In this model, the term “forest” connotes a natural-scientist concept; it translates the concept of “forest” as perceived through the forestry curricula of two Mediterranean countries: Italy and Syria. Compared with the next two models, the forest constitutive element “Man” in this type of concept occupies the last position. The forest perceived through this model is represented through the elements “Plant, Soil, Animal”; whereas, the element “Man” is presented through courses as an exploiter of the element “Plant” which is the source of wood (trees), but not in the form of a socio-economic dimension of forests (forest neighbors, stakeholders and local social needs). The modest presence rate of the element “Interactions” indicates that holders of the natural-scientist concept deal with forest through a mono-disciplinary approach.

2. Transitional socio-economist “forest”: This model of “forest” represents the concept “forest” as perceived through the forestry curricula of one European and three Near-eastern countries: Sudan, Turkey, Iran and Spain. It represents a transitional socio-economist concept; in this type of concept, the forest constitutive elements “Plant and Man” come in the second position compared to those of the two remaining models. The forest perceived through this model is mainly characterized through the elements “Plant and Interaction”. The element “Man” is still presented through courses as an exploiter of the element “Plant” which is the source of wood

(trees). The element "Interactions" in this concept has the higher importance compared to those of the other two models; this feature could be didactically translated into an interdisciplinary approach of forest perception. This characteristic represents a trend in the direction of a possible increase of socio-economic implication in the concept "forest".

3. Semi-socio-economist "forest": This model of "forest" translates the concept of "forest" as perceived through the forestry curricula of three European countries: Bosnia & Herzegovina, the U.K., and France. In the semi-socio-economist concept, the forest constitutive element "Man" occupies the first position compared to those of the earliest two models. The forest perceived through this model is represented through the element "Plant"; whereas, the other elements are less important. The element "Man" is not only presented through courses as an exploiter of the element "Plant" which is the source of wood (trees), but also partially presented as a socio-economic aspect of "forest" through few courses such as "multipurpose forest management and natural resource assessment". These courses indispensably deal with stakeholders and local social needs. The presence rate of the element "Interactions" indicates that holders of the semi-socio-economist concept deal with forest through a multidisciplinary approach.

IV-6. "Forest" as a reference to RSeR

What are the implications of disciplinary fields and characteristic forests for the incorporation of the concept "forest", as a reference to RSeR, in forestry curricula

To begin with, the management of "forest" as an RSeR requires the consideration of the five constitutive elements of forest as a whole and the acceptance of the logic of durability as a framework.

The analysis of regional disciplinary fields and "characteristic forests" indicates that the analyzed curricula give less importance to the field of human and social sciences in comparison with other fields. Correspondingly, the analysis of regional "characteristic forest" showed that, compared to the Near-eastern, the European model of "forest" is closer to the connotation of "forest" as an RSeR, but it is not sufficient at all to denote an RSeR. In fact, neither the European models of "forest" nor the three identified models of "forest" - the natural-scientist, the transitional socio-economist and the semi-socio-economist - are representative of the real connotation of "forest" as an RSeR.

Unfortunately, this result reflects the aforementioned traditional model of the "forest" which still dominates the educational philosophy in several worldwide forestry institutions.

To sum up, the incorporation of the concept "forest" as a reference to RSeR necessitates some changes which should be brought into the basic philosophy of forestry education; in a forest, the tree is not more important than the Man and vice-versa. That is to say, educationists are invited to adopt the term of "natural milieu" as a background for any curricular design in relation to forestry education. Without forgetting the actual social needs, the instruction designers should think of forest neighbors, stakeholders, local social needs and those of future generations.

The implementation of durability logic in forestry education necessitates facilitating the involvement and the implication of different stakeholders within the forestry decision-making process. Furthermore, forest future-engineers should be able to identify current and future management challenges and opportunities and their implications for a long term collaborative action.

V- Conclusions:

The regional factor has statistically a significant importance. With reference to disciplinary fields, the regional factor comes into view through the identification of two groupings of similar national forestry curricula. Despite the moderate rate of human and social sciences implication in all studied forestry curricula, it played a decisive role in the identification of the two regional contexts: the European and the Near-eastern.

Consequently, the regional factor has, to some extent, an impact on the elaboration of forestry curricula and the identification of their contents. Throughout the analyzed curricula, the regional factor was also recognized as an indicator of the existing of trends towards considering or neglecting the forest as an RSeR.

Concerning the involvement level of human and social sciences in forestry curricula, the aforementioned results indicate that the traditional model of the “forest” is still dominating the forestry educational philosophy; the forest is not more than a source of wood, and the forest engineer is seen as a technician and wood harvester.

The conceptualization of the regional “characteristic forest” illustrates that: Compared to European, the Near-eastern forestry curricula contain more courses in relation to the constitutive elements “Plant, Soil and Interactions” and fewer courses about the constitutive element “Man”. This result shows that, with reference to the Near-eastern, the European model of “forest” is closer to the connotation of “forest” as an RSeR, but it is not sufficient at all to induct that the European model of “forest” could represent the real meaning of “forest” as an RSeR. Consequently, three identified models of “forest” could be described as follows:

- *The natural-scientist “forest”*: This connotation translates the concept of “forest” as perceived through the forestry curricula of two Mediterranean countries: Italy and Syria. Via this concept, the educational forestry institutions deal with the term “forest” through a mono-disciplinary approach.

- *The transitional socio-economist “forest”*: This model of “forest” is perceived through the forestry curricula of one European and three Near-eastern countries: Sudan, Turkey, Iran and Spain. Holders of this concept partially deal with the term “forest” through an interdisciplinary approach.

- *The semi-socio-economist “forest”*: This model of “forest” is perceived through the forestry curricula of three European countries: Bosnia & Herzegovina, the U.K., and France. Through this model, the “forest” is educationally seen through a multidisciplinary approach.

Considering "forest" as an RSeR in the management process requires the implication of the five constitutive elements of forest as a whole. The analysis of "characteristic forest" indicates that none of the three identified models of "forest" are representative of the real connotation of "forest" as an RSeR. Indeed, the traditional model of "forest" still dominates the educational philosophy in the studied forestry institutions. That's why, the above-mentioned new terms which were adopted in forestry sector (such as diversity and stability, sustainability, renewable natural resources and participatory approach) are not sufficient to resolve the problem of forest management. Despite an intense use of these terms in forestry sector, the "Man" is still considered an extrinsic element with reference to the forest. Therefore the situation of forests is still, quantitatively and qualitatively, in regression.

Accordingly, the concept of "forest" as an RSeR is not realizable through the existing forestry curricula. Therefore, the occupational profile of forest future-engineers should be redefined and attuned. Subsequently, forestry curricula should be reconstructed according to new references and new rigorous criteria.

To sum up, the incorporation of the concept "forest" as a reference to RSeR necessitates some changes which should be brought into the basic philosophy of forestry education. Furthermore, the durability logic implementation requires the promoting of stakeholders' involvement and implication within forestry decision-making process through forestry curricula. Accordingly, forest future-engineers could be well qualified to stand for a collaborative long term action.

As a final point, the comparison of the above-mentioned conclusions with other research-works in the field confirms and validates the observation done by Lund (2009) concerning the lacking of agreement on a standard definition of "forest", the research-work outputs presented by Cheikho and Clément (2002) concerning the polyvalency of the term "forest" the remark done by Simonneaux (1999) concerning the influence of socio-economic circumstances on any career in the rural world and also the observation done by Cheikho (2005, 2002) concerning the disregard of socio-economic dimensions of forests in most forestry curricula.

To finish, this article could pertinently **recommend** the following: the reform of the educational philosophy of forestry institutions to consider the "Man" as an intrinsic element with reference to the forest; the adjustment reidentification of forest engineers' occupational profile with reference to local socio-economic needs and international circumstances and challenges; the consultation of forest stakeholders with reference to forestry curricula shaping and the implementation of forestry curricula through a multidisciplinary approach.

VI- References:

AIFM. (2001) *Compte-rendu séminaire "Formation, recherche, sensibilisation"*. (Association Internationale des Forêts Méditerranéennes AIFM/01/24014 - 15 mai 2001). Marseille (France).

Al Najjar K. & Gazal H. (1990) *Fundimentales of Statistics and Experiments Design*. University of Aleppo: Aleppo University Press, p. 372.

Brown N. (2003) *A Critical Review of Forestry Education*. In Bioscience Education e-journal (BEE-j),1(1).

<http://bio.ltsn.ac.uk/journal/vol1/beej-1-4.htm>.

Cheikho, M. (1993) *Forestry' ecological Survey of Al Nabi Houri' region (West north of Aleppo)*. Dissertation of Engineer Diploma. Faculty of agriculture, University of Aleppo, Syria.

Cheikho, M. (2001) *Pluridisciplinarité et pédagogie active dans la Formation au Métier d'Ingénieur forestier: approche historique*. In Didactique de la Biologie, recherches, innovations, formations. ENS, Alger. PP. 429 - 450.

Cheikho, M. (2002) *Pluridisciplinarité et foresterie: recherche, gestion, pédagogie de projet et formation des ingénieurs forestiers*. Thèse de doctorat, Université Claude Bernard Lyon 1, France.

Cheikho, M. (2005) *The Arab Institute for Forestry and Range (AIFR) Curriculum Analysis, Revision and Improvement*. Report presented to Food and Agriculture Organization (FAO) Damascus, Syria.

Cheikho, M., Clément, P. & Bariteau, M. (1999) *Education à l'Environnement: Conceptions de chercheurs et d'autres acteurs impliqués dans des programmes pluridisciplinaires sur la forêt méditerranéenne*. In L'actualité de la recherche en didactique des sciences et des techniques. Actes des Premières Rencontres scientifiques de l'ARDIST, pp. 51-57. ENS Cachan, France.

Cheikho, M., Clément, P. (2002). *Pluridisciplinarité et complexité dans la formation au métier d'ingénieur forestier*. In Aster, 34, 97- 130. INRP. Paris.

Demard, J.C. (1980). *L'utilisation du bois dans la tradition paysanne et d'artisanale comtoise*. In Revue Forestière Française, numéro spécial, Nancy.

Durkheim, É. (1922/1973) *Éducation et sociologie*. Paris: PUF. (1^{ère} édition - 1922)

FAO (2001) *Forestry curriculum development and revision - case studies in developing countries (Morocco, Namibia, Vietnam Ukraine Honduras and Uruguay)*. Rome.

Giordan A., Souchon C. (1994) *Une éducation pour l'environnement*. Nice, Z' éditions, p122.

Lund, H. Gyde (coord.) 2009. *Definitions of Forest, Deforestation, Afforestation, and Reforestation*. Gainesville, VA: Forest Information Services. <http://home.comcast.net/~gyde/DEFpaper.htm>

Mazoyer M., Roudart, L (1998) *Histoire des Agricultures Du Monde du Néolithique à La Crise Contemporaine*. Edition du Suil. Paris.

Pardé J. (1999) Des temps gallo-romains aux temps contemporains: premiers pas et progrès des aménagements. Revue forestière française, numéro spéciale. ENGREF, France.

Pickett, Joseph P. et al. (2000). *The American Heritage® Dictionary of the English Language*, 4th ed. Boston: Houghton Mifflin.

Simonneaux, L. (1999). *Les mutations du monde agricole et l'évolution de l'identité des enseignants: la question de l'interdisciplinarité*. In séminaire interdisciplinaire, INFA. Toulouse.

Von Uexküll, J. (1934/1965) *Mondes Animaux et Monde Humain*. Traduction française: Paris: Denoël, 1965. In Cheikho, M., Clément, P. (2002). *Pluridisciplinarité et complexité dans la formation au métier d'ingénieur forestier*. In Aster, 34,97- 130. INRP. Paris.

<< وصل هذا البحث إلى المجلة بتاريخ 2009/12/21، وصدرت الموافقة على نشره بتاريخ 2010/5/19 >>