

مدى تناسب نظام التعليم الحراجي مع عقدية الممارسة المهنية وفقاً لمهندسين عاملين في قطاع الحراج السوري

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المخلص

يتميز النظام البيئي للغابة بالعقدية في أبعاده البيئية، والاجتماعية-الاقتصادية والاجتماعية-السياسية والتشريعية؛ الأمر الذي يجعل من الممارسة المهنية للمهندسين الحراجيين أمراً معقداً جداً. لقد أظهرت دراسات سابقة كتلك التي قام بها Cheikho (2009) و Martini (2009) عن القطاع الحراجي السوري أنّ العاملين في هذا القطاع يجدون صعوبات في ممارسة مهنتهم الحراجية. ضمن هذا السياق ونظراً إلى واقع الحالة المتدهورة للغابات الطبيعية في سورية، يمكن عدّ مخرجات مؤسسات التعليم الحراجي موضوعاً منطقياً للمناقشة مع العاملين في قطاع الحراج. ضمن هذا الإطار، أُجريت مقابلات مع مجموعة من المهندسين العاملين في قطاع الحراج السوري، لمناقشة المتطلبات الواجب توافرها لتأهيل مهندسين حراجيين بسوية تدريب عالية. سعى هذا البحث إلى توضيح مدى التناسب بين مؤسسات التعليم الحراجي في سورية من جهة، والممارسة الحقيقية لهذه المهنة من جهة أخرى. تَكَوَّنَت العينة المستهدفة عبر هذا البحث من واحد وعشرين من المهندسين العاملين في قطاع الحراج السوري وقد جُمِعَت البيانات عبر إجراء مقابلات مكتوبة شبيهة مقننة ومكتومة التعريف. للإجابة عن السؤال الإشكالي لهذا البحث والأسئلة الفرعية المنبثقة عنه، أُخْضِعَت المعطيات المُتَحَصَّل عليها لعملية تحليل مضمون عبر نظام تصنيفي خاص بهذا الهدف. وفق مخرجات هذا البحث، عرّفت موضوعات عدّة على أنها بحاجة لأن تُؤخذ بجديّة أكبر في مؤسسات التعليم الحراجي كما حُدِّدَت مستويات قيمية عدة وقد تم الحصول على مجموعة من النتائج المتعلقة بالأبعاد المؤسسية والمهنية والتعليمية التي يمكن أن تسهم في توضيح مستوى التوافق بين المؤسسات السورية المعنية بالتعليم الحراجي، وعقدية الممارسة الحقيقية لهذه المهنة.

الكلمات المفتاحية: حراجي؛ عقدية؛ ممارسة حقيقية؛ مهني؛ تعليمي؛ مهندس حراجي؛ سوري؛ مناهج.

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Forestry Educational System Aptness towards Related Professional Praxis Complexity according to In-Service Syrian Forest Engineers

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Abstract

The complexity of the forest ecosystem is pervasive at ecological, socio-economic, socio-politic, and legislative levels; as a result, forest engineers' practices are very complex. Previous studies on Syrian forestry sector, such as that of Cheikho (2009) and Martini (2009), have mentioned that Syrian forestry sector staffs find difficulties in practicing their career; within this context and seeing the actual degraded situation of Syrian natural forests, Syrian forestry educational institutions outputs could represent a legitimate discussing subject with Syrian forestry staffs. Along with this framework, in-service forest engineers have been interviewed to discuss professional requirements for being a well-trained forest engineer. This research tries to identify the aptness level of Syrian forestry educational institutions towards the real practice of their career. The targeted sample of this research consisted of twenty-one in-service Syrian forest engineers; Data were collected through carrying out semi-directive anonymous written interviews with them. According to a specific categorization system, the compilation of data has been submitted into a content analysis to find answers to this research problematic and questions. According to this research outputs, several subjects were perceived as slightly undertaken by forestry educational institutions and need to be enhanced; different levels of related values were identified. Accordingly, different institutional, job-related and educational interpretations have been made to discuss the aptness level of the Syrian forestry educational system towards the professional forestry praxis complexity.

Key words: Forestry; complexity; praxis; professional; educational; forest engineer; Syrian.

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I. Introduction

The educational professional institutions represent the source of skillful human resources for any society. Replying different human and social needs, these institutions were officially founded, collectively funded and thus they are through their outputs socially legitimized; their role is to provide societies with well-qualified and high-trained graduates. Making students acquire the most efficient and the most updated specialized professional skills should represent one of the most important objectives of these educational institutions.

In forestry, the training of forest engineers is more complicated due to the complexity of the training subject which is the forest; in fact, the complexity of the forest ecosystem is omnipresent at ecological, socio-economic, socio-politic, and legislative levels. As a result, the most credible standards for the assessment of educational forestry institutions outputs is the concrete achievements of their graduates, their strongpoints, weakness, and concerns.

Seeing the actual degraded situation of Syrian natural forests, the questioning about the aptness of forestry educational system towards the complexity of forest ecosystem and its related professional praxis of Syrian forest engineers represents a pertinent matter.

II. Theoretical Framework

II.1. Complexity and Professional Praxis

The antonym has generally played an explicatory role, but in some cases it could represent itself a problematic issue; this is the case of the term of complexity. Actually, in Arabic, English, French, and any international language the connotation of "simplicity" is understood as an antonym of that of "complexity; this could be true but not entirely. In fact, it is not a joke to say that the term of simplicity represents itself a typical case of complexity; for instance, the term of simplicity has been clarified in the English dictionary as; (1) *the quality or condition of being simple*, (2) *a thing that is simple*. The dictionary entry doesn't add any new elements to clarify the meaning of simplicity. In this context, the term of simplicity is used as a black box or a kind of etymological tool for avoiding complexity characters through ignoring its justificatory motives; unfortunately, this could aggravate the deprived understanding of facts.

In reality, the complexity is imposed everywhere and every time in life; it could be seen at atomic scale as at that of the galaxy in all fields and sectors without exception. Therefore, justificatory motives that could be behind the feeling of complexity presence are indefinite and for a big part of them unpredictable. Generally, the complexity as a transversal and cross-sectorial concept indicates a general difficulty in dealing with a given matter and translates a lack of knowledge concerning a given question. By the same token, Fogelman Soulié (1991) has considered that the feeling of complexity presence could represent a kind of explication through helping in identifying missing knowledge.

“For a long time, designating something as complex means its difficulty in being understood or implemented, but strangely this could simultaneously play an oral explicatory role in elucidating inexplicable things: the feeling of complexity presence could allow the justification and the delimitation of the lack in theoretical knowledge instead of being in front of illusory and insufficient explications.” (Soulié 1991, P. 9)

The complexity could be also used to designate things that; consist of different and connected parts; affected by different factors and conditions, caused by different levels of interventions or impacts, etc. In brief, the complexity could be a porter of different forms, meanings, and representations.

Facing the complexity issue, several thinkers, each in his field, have tried to find applicable solutions through theoretical and/or empirical models. For Durkheim (1858-1917), the scientific knowledge teaching should provide learners with an applicable reasoning tool and an actual image of active reasoning towards complexity; according to him, learners should be familiar with the complexity issue and aware of practical details of scientific and technical development history. In view of that, the complexity “as an omnipresent problematic” could be faced through rational action; this suggestion was similarly evoked by Antonio GRAMSCI (1891-1937) and Paulo FREIRE (1921–1997). Monasta (1993) has mentioned that the praxis for GRAMSCI is preferable to any other educational approach, not for theoretical reasons but rather for practical reasons. According to Monasta (1993), Gramsci’ philosophy of praxis reflects the inseparable correlation between theory and practice. In the same direction, the concept of praxis was proposed by FREIRE as an instrument to face the reality; Gerhardt (1993) indicates that the praxis for

FREIRE represents the dialectic relationship of action and reflection. The educational objective of FREIRE is to enable people being deeply aware not only of their lives' sociocultural reality but also of their capacities in controlling this reality.

To end with, the complexity is a transversal and cross-sectorial concept; it could be materialized in different forms and a porter of diverse meanings and representations but it could not be discerned through the simplification; this could aggravate the deprived understanding of facts. Facing this omnipresent complexity could be plausible through owning an applicable reasoning tool and being familiar with complex situations; accordingly, the Philosophy of praxis represents a tangible method.

II.2. Forestry engineering career

Bearing in mind its irregular ecological structure nature as well as its multiple and singular links, forest was underlined by Cheikho and Clément (2002) as a porter of double complexity. In view of that and taking into consideration the variability and the non-predictability of natural challenges impacts such as that of climate change, energy crisis, wars, and global food crisis on forests and natural milieus, the mission of forest engineer is increasingly become more complex.

The engineer is the person who is talented to generate solutions to rejoin unanticipated given problems. This way Cheikho (2007) has epistemologically identified the term of "engineer". This definition could translate not only the immense responsibility of engineer, but also his vital specific needs of qualification and training. Jones (1999) has mentioned that the engineering practice today is increasingly international, with cross-border practice of the profession becoming pervasive.

In forestry, the career of forest engineer is more complex not only due to its immense responsibility and specific needs of qualification but also due to the nature of "forest" which represents the subject of this career. In fact, the career of forest engineer is qualified as highly difficult by Cheikho (2012). For him, this career imposes the professional implementation of conceptual and technical knowledge and relevant skills for natural forest resources management within unpredictable contextual conditions according to a specific system of professional values and a set of ecological and socio-economic considerations through

an infield communicative and participatory approach. The difficulty of forest engineering career could be also seen through the description done in 1999 by the French national school for rural engineering, water and forestry (ENGREF) concerning its graduates' capacities.

“A forest engineer is a specialist in forestry and environment and through his relevant scientific qualification and practical contact with forests able to develop a specific talent for controlling living systems and implementing long-termed plans, simultaneously take into consideration ecological, economic, human components of encountered problems, and being able to be adaptable to deal with quick evaluative environment.” (ENGREF 1999, P. 4)

In Syrian, forest engineers are usually graduated from the faculty of agricultural engineering with a specific diploma in forestry and ecology. Through their academic study, the futures forest engineers should receive a sufficient package of theoretical provision and practical skills to be able to practice their future career. The five years they have to spend at the faculty consist of three years of common courses and two years of specific courses in forestry and ecology. The two years of specialization include theoretical courses and practical assignments in forestry ecology, rangelands, dendrology, genetic amelioration of forests trees, forests trees physiology, forestry seeds and nursery, gardening, preventive afforestation, productive afforestation, forest prevention, forest fire and other disasters, forest management, forests breeding, forestry exploitation, forestry plants and wood diseases, forests insects, pests fighting, forestry soils, soils conservation, hydrology and watersheds management, forestry machinery, forestry industry and wood technology, forestry measurements, computer skills, forestry engineering, maps and cartography, topography, irrigation and drainage, forests economy, forestry legislation and forest policy, rural society and extension, in addition to the graduation project. The educational exercises are almost hypothetical and prearranged with respect to curricular needs; their outputs are naturally evaluated inside the faculty according to its related explicit educational objectives. Unfortunately, this type of exercises is not applicable in real-life; it could lead to the learning of theoretical concepts rather than real-life applicable skills, and thus the operational quality of future forest engineers could be seriously limited.

II.3. Forestry Educational Methods

Summarizing the teaching problem, Morin (1998) has considered that challenges such as the globalism, the inappropriateness are increasingly bigger, deeper, and even more serious between a specialized disciplinary knowledge (actually, dispersed into separated elements) and real problems more and more multidisciplinary, trans-disciplinary, multi-dimensional, universal, global, and planetary. To some extent, the problem described by Morin translates the academic situation of Syrian forestry educational system. At the faculty, the future forest engineers receive different courses through a mono-disciplinary approach and this reduces their abilities of dealing with the infield complexity.

Cheikho (2011) has identified thirteen potential disciplinary fields of learning in forestry; techniques, methodology, fieldwork skills, context, tools, social aspect, professional skills, values, communicative skills, teamwork skills, economy, ecology, and scientific concepts; according to him, several field of learning are unfortunately not easily acquired inside the classroom such as that of infield forestry techniques, fieldwork skills, context, social aspect, professional skills, values, and teamwork skills. Through an interregional curricular comparative study, Cheikho (2013) has proved that the “forest” seen through Syrian forestry curricula represents a natural-scientist “forest”; i.e. the educational forestry institutions deal with the term “forest” through a mono-disciplinary scientific approach.

Concerning the practical teaching, the future forest engineers acquire practical skills through hypothetical and prearranged exercises proposed by their faculty educational staffs. Unfortunately, this type of exercises deprive learners the acquisition of multidimensional competences as well as several infield, contextual and socio-economic skills; and thus it could have negative impacts on the future engineers operational qualities.

II.4. Forestry administration framework

As the biggest part of Syrian forest is located within a public property lands, the management of forests is mainly held by the government; through its central forestry directorate and related provincial departments. The Ministry of Agriculture and Agrarian Reform is responsible of forest management, forest-related policy and legislation application, and other different forestry activities such as; degraded lands afforestation,

reforestation and rehabilitation; protected areas initiation; forest protection, biodiversity conservation and development.

Martini (2009) has reported that the institutional framework of forestry sector has several problems and constraints; to start with, the repressive nature of Syrian forestry legislation caused negative relations and several types of conflicts with forest neighbors and rural communities. Furthermore, there are some economic constraints due to an institutional and governance weakness, a coordinative and transversal policy deficiency, unresolved land tenure issues, and a technical capacity insufficiency. In addition, the centralization of planning and decision-making as well as the top-down system of forestry administration limits liberal actions of forest engineers in provincial and local departments of forestry situation and causes damages to private sector and civil society organizations.

Concerning the background qualification of Syrian forestry administration staffs, the forestry directorate has not only been ruled for several decades by engineers with agricultural background but it has also recruited agricultural engineers to achieve forestry tasks; this caused actually negative impacts on Syrian forest situation through non-specialist acts and inappropriate management. In fact, the forestry directorate was established in 1943 when Syrian Universities have not initiated yet a specific program for forest engineers training; actually, the academic training of forest engineers relatively recent in Syria. Martini (2009) has mentioned that the first higher forestry education in Syria started at the University of Aleppo and the first group of forest engineers was graduated in 1993.

Through his assessment of the Syrian forest sector institutional capacities, Cheikho (2009) indicated that Syrian forestry sector has administrative difficulties related to the centralization of decision-making process and the presence of a double administrative subordination; provincial forestry departments are administratively connected not only to the general directorate of forests, but also to the provincial directorate of agriculture. According to that assessment, forestry legislations need to be clearly formulated, administrative formalities and procedures need to be simplified, and private ownerships should be respected. Finally, with reference to forestry research and training development needs, the assessment outputs indicated that technical studies divisions need to be

initiated at local level in each forest department, an in-service training and forestry extension activities need to be enhanced, a coordinating system with other forestry stakeholders needs to be established, provincial forest departments need to be provided with highly qualified staffs, and the system of forestry work need to be modified to be more decentralized.

III. Research Context and Procedures

III.1. Purposes and Objectives

This research finds its justifications through several outputs obtained by Cheikho (2009) on the assessment of institutional capacities of Syrian forest sector. These outputs have mentioned that Syrian forestry sector staffs have several types of difficulties in practicing their career due to not only legislative, administrative, and procedural obstacles but also to scientific and technical deficiencies; these outputs have mentioned the practical needs for the in-service training on technical, socio-economic and communicative skills, and forestry extension activities.

Taking into consideration the academic qualification of the Syrian forestry staffs, the previous outputs provoke actually the questioning about the pertinence of the related educational system towards the professional practice of forest engineer. Accordingly, **the problematic question** of this paper could be formulated as follows:

What is the appropriateness level of the Syrian forestry educational system towards the professional forestry praxis complexity according to In-service Syrian Forest Engineers?

In view of that, the research objectives were developed as follows:

1. What subjects do the interviewed persons think need to be educationally enhanced at forestry institutions for a well qualification of future forest engineers?
2. What institutional, job-related and educational significations could be perceived through the proposed subjects?
3. What job-related difficulties and specific implicit concerns could be perceived through the interviewed forest engineers discourses?
4. What institutional, job-related and educational significations could be perceived through the identified job-related difficulties and specific implicit concerns?
5. What professional values should be assimilated by forest engineers as per their discourses?

6. What institutional, job-related and educational significations could be perceived through the identified professional values?

III.2. Procedures

This research data were collected through carrying out semi-directive interviews with twenty-one in-service engineers; these interviewees are in employment at the Syrian forestry directorate and related departments. The objective of these interviews is to obtain a verbal account concerning their valuation of forestry educational institutions from which they have been graduated with reference to the actual fact of the career of forest engineer they have experienced for several years. To attain this objective, two main open-ended questions were carefully formulated to incite the interviewed people expressing through the lack feeling about their educational hopes and desires; accordingly, each interviewee has been asked to freely answer on paper and anonymously the following two questions:

1. As an in-service forest engineer, what subjects do you think should be acquired by the future forest engineers at educational institutions before their integration within the real world of forestry career?
2. What specific professional values should be assimilated by an in-service forest engineer?

III.2.1 The validity of Procedures

As all the interviewed persons are in-service and some of them are in charge in forestry sector, some of their declarations could be officially cause detriment; therefore, the anonymity (name and post title) of these interviews was purposely imposed to facilitate the obtaining of spontaneous, objective and untraceable speeches. Through this technique, the written answers could include a frank evaluation through explicit statements of institutional and professional aspects, negative conduits of forestry staffs, and other critical subjects.

The compilation of written data has been submitted into content analysis process to find answers to this research problematic and questions. To enhance the validity of Procedures, the contents of written discourses were carefully classified by using a specific analytical table. This table, which contains the discourses' elements as rows and the categorization system as columns, is designed to be open-ended to incorporate new probable categories; each phrase of the corpus could be classified under one or more categories along with the possible

understandable meaning(s). According to research questions, the categorization system was conceived to separately identify; subjects proposed by the interviewees to be educationally enhanced, job-related difficulties and specific implicit concerns, and professional values should be assimilated by forest engineers as categories. Consequently, the analytical categories were identified little by little according to the presence of new meaning. Here is an example:

Phrase	Technological skills	Communicative skills	Infield practices	::	::	::	::	::	::	::	::	Etc.
الجرد وفق وحدات GIS	+											
طرق التواصل والاحتكاك مع السكان		+										
والأهم هو التطبيق العملي والميداني			+									
...												
...												
Etc.												

III.2.2 The reliability of rater

The inter-reliability of rater was established through carrying out two intervallic content analyses of the whole written interviews by the researcher himself, this repetitive work was necessary to insure the consistency of analytical procedures. The next step of this analytical process is to quantify the obtained categories according to research questions. To rejoin the specific needs of this research, the treatment of quantification outputs was done by using the Excel software (Microsoft® Office product).

IV. Results

The analysis of the written interviews has led to obtain a number of categories of speech. The next paragraphs contain an exhaustive description of results according to the research questions.

IV.1. Subjects need to be educationally enhanced

Answering the first question of this research, the content analysis indicates that the interviewed forestry staffs' discourses include five main categories of speeches (table 1); these categories translate actually the subjects proposed by the interviewed persons to be educationally enhanced at forestry institutions for a well qualification of future forest engineers.

Table (1): The five main categories of speeches

Discourses categories	%
Infield practices and teamwork skills	34
Technologic skills	22
Employment ethics and values	17
Specific forestry skills	15
Judicial and socio-communicative skills	12

The first category of speech is connected to the enhancing of Infield practices and teamwork skills; the content analysis outputs indicate that this category which represents 34% of related answers is composed of two subcategories; the infield practices as well as the participatory approach and teamwork skills. In fact, 90% of phrases classified under this category are about the Infield practices and related skills while 10% of them only are about participatory approach and teamwork skills.

The second category of speech is about technologic skills. It represents 22% of related answers and consists of two subcategories; the first which represents 58% of this category related answers concerns new technologies related to different forestry uses such as forest fire fighting, survey, and data collection. The second subcategory is about scientific research methodologies such as analysis, application, and reporting; it represents 42% of phrases classified under this category.

The third category of speech is about employment ethics and related values; it represents 17% of related answers and includes two subcategories; the employment ethics (rights and duties) as well as related practices with 46% of this category related phrases and forestry professional values with 36% of presence rate.

The fourth category of speech is that of specific forestry skills. It represents 15% of related answers and consists of two subcategories; the

first which represents 62% of this category related answers concerns forest management and planning. The second subcategory is about natural catastrophes fronting and Forest fire fighting skills; it represents 38% of phrases classified under this category.

The fifth category of speech is about judicial and socio-communicative skills; it represents 12% of related answers and composed of three subcategories; communicative skills with 40% of this category related answers, legislative knowledge with 30% of presence rate, and rural and forestry socio-economic knowledge with 30% of presence rate.

To sum up, five subjects were proposed to be educationally enhanced at forestry institutions for a well qualification of future forest engineers: Infield practices and teamwork skills, technologic skills, employment ethics and values, specific forestry skills, and judicial and socio-communicative skills.

IV.2. Institutional, job-related and educational significations of proposed subjects

With reference to the second question of this research, the obtained written interviews were submitted to double content analyses in order to separately identify their institutional, job-related state of affairs and educational significations.

IV.2.1. Institutional and job-related significations

Through their speeches, the interviewed forestry staffs have highly focused on the subject of infield practices and its related skills; this translates not only the importance of this subject for their career, but also the existence of a general weakness in practical skills within their professional milieu. For them, the complexity of the forestry career' real practices are almost unexpected.

Concerning the subject of participatory approach and teamwork skills, the analyzed speeches indicate that Syrian forestry staffs' practices are more individual than collective; this statement translates a deficient coordination in the Syrian infield forestry work and could be due to organizational, communicative, and willing obstacles.

With reference to the subject of technologic skills, the interviewed forestry staffs' speeches reflect the encountered difficulties in applying theoretical scientific methodologies within a complex and multidimensional situations as well as a deficiency in forestry related new technologies. Their speeches reflect as well a deficiency in forestry

related informatics tools and their related skills; this deficiency could be understood through their statements concerning the lack in forestry informatics data bases, surveys outputs, and digital maps. The interviewed staffs have explicitly expressed their need for continuous training courses on forestry related informatics skills for being able of making use of the geographic information system (GIS) and Global Positioning Systems (GPS) within their forestry tasks.

Concerning the subject of employment ethics and values, the analyzed speeches indicate that the career of forest engineer could not be practiced without the assimilation of its specific professional values; this reflects actually implicit critics of the recruitment of non-specialists such as agricultural engineers in forestry work-sites. The interviewees' speeches reflect also a negative image of forestry administrative state of affairs concerning the respect of employment ethics through mentioning several signs of ethical deterioration such as the non-respecting of rights and duties. According to these outputs, ethical culture needs to be reinstalled in forestry sector.

With reference to the subject of specific forestry skills, the analyzed speeches have focused on forest management and planning as well as natural catastrophes and forest fire fronting; this reflects actually three aspects:

1. The absence of a clear national forest policy and strategic plans.
2. The Syrian forestry sector has some weakness concerning specific topics such as that of forestry natural catastrophes and forest fire fighting.
3. The deficiency in skills related to the integrated forestry management.

As a final point, the evoking of judicial and socio-communicative skills by the interviewed staffs indicates that the Syrian forestry sector has some weakness concerning rural and forestry socio-communicative knowledge and skills; and this translate actually the complexity of forestry practices due to the wide range of forestry stakeholders (rural societies, forest neighbors, colleagues, workers, etc.) and their multifaceted relationships with forests.

The analyzed speeches reflect also the weakness of Syrian forestry staffs with reference to forestry socio-economic and jurisdictional aspects; and this reflects the big number of socio-economic conflicts and their seriousness with reference to the forest.

In brief, the Syrian forestry sector represents an arena of a big number of forestry socio-economic conflicts and a wide range of forestry stakeholders with multifaceted forestry relationships. Forestry staffs criticized the absence of a clear national forest policy and the recruitment of agricultural engineers in forestry work-sites; they have a negative impression of forestry administration state of affairs concerning the respect of employment ethics; for them new culture of rights and duties needs to be reinstalled. Due to organizational, communicative, coordinative, and willing obstacles, Syrian forestry practices are more individual than collective. The job-related complexity of the career real practices is almost unexpected and appears through difficulties in applying theoretical scientific methodologies within complex and multidimensional situations. The Syrian forestry staffs have a weakness in; forestry related new technologies and informatics skills; natural catastrophes and forest fire fighting skills; integrated forestry management and infield practices skills.

IV.2.2. Educational and didactic significations

The subject of infield practices and its related skills was highly presented within the interviewed forestry staffs speeches. Educationally, this reflects two points of weakness; the first concerns the lack of forestry curricular updating along with the development of forest engineer occupational profile, and the second concerns the insufficient educative cooperation between the educational institutions (universities) and the plausible sites of employment of future forest engineers.

Concerning the subject of participatory approach and teamwork skills, the analyzed discourses reflect the excessive use of individual assignments compared to collective training projects in teaching-learning process, students' works' evaluation and other educative activities of forestry educational institutions.

With reference to the subject of scientific methodologies and technologic skills, the difficulties encountered by the interviewed forestry staffs reflect the mono-disciplinary approach of teaching-learning process, the lack in practical and functional consideration of theoretical scientific methodologies; and an insufficiency in forestry related informatics skills teaching in forestry educational institutions.

Regarding the subject of employment ethics and values, the analyzed speeches have mentioned the non-consideration of forestry professional

values and employment ethics though forestry curricula and teaching-learning process; future forest engineers receive actually a pure scientific qualification.

With reference to the subject of specific forestry skills, the analyzed speeches reflect the insufficient consideration of forestry field complexity through teaching forest management skills in forestry educational institutions and the insufficient focusing on natural catastrophes fronting and Forest fire fighting skills though forestry curricula.

Finally and concerning the subject of judicial and socio-communicative skills, the analyzed speeches indicate that forestry educational institutions provide the future forest engineers with a pure academic qualification and neglect or inadequately consider socio-communicative skills through their curricula.

The analyzed speeches reflect also an insufficiency in forestry legislations teaching and a deficiency in the training on forestry socio-economic aspects.

To sum up, forestry educational institutions provide a pure academic qualification via a mono-disciplinary approach neglecting or inadequately considering socio-communicative skills, forestry professional values, and employment ethics through their curricula; their educational activities depend on individual practical assignments rather than collective training projects. Educational forestry institutions have a deficiency in: functional consideration of theoretical methodologies, curricular updating along with the forest engineer' occupational profile development; educational consideration of forest management complexity, and educational cooperation with future forest engineers' plausible sites of employment. These institutions have also an insufficiency in teaching: natural catastrophes fronting skills, forestry related informatics skills, forestry legislations and socio-economic aspects.

IV.3. Job-related difficulties and specific implicit concerns

Answering the third question of this research, the content analysis outputs show that difficulties and specific implicit concerns of the interviewed forestry staffs could be grouped within three main categories (table 2).

Table (2): The five main categories of speeches

Discourses categories	%
Forestry admin state of affairs	50
Forest engineer professional quality	31
Career practice concerns	19

The first category is related to the forestry admin state of affairs. It represents 50% of relevant answers is composed of four subcategories; the sense of duty and responsibility ethics with 42% of phrases classified under this category, the decision-making capacity with 37% of presence percentage, the honesty with 13% of presence percentage, and finally the need for a clear forest policy and long-term planning with 8% of presence percentage.

The second category of speech is about forest engineer professional quality. It represents 31% of related answers and consists of three subcategories; 40% of this category related answers are about the continuous training and the long-life learning issue. The second subcategory is about the specialization and professional experience; it represents 33% of this category related answers. The third subcategory concerns the teamwork skills issue; it represents 27% of phrases classified under this category.

The third category of speech is that of the career practice concerns. It represents 19% of related answers and consists of three subcategories; the first represents 56% of this category related answers and concerns socio-economic knowledge and skills. The second subcategory is about the infield skills; it represents 22% of phrases classified under this category. The third subcategory concerns the patience value; it represents 22% of phrases under this category.

In brief, three fields of job-related difficulties and specific implicit concerns were identified; forestry admin state of affairs, forest engineer professional quality, and career practice concerns.

IV.4. Institutional, job-related and educational significations of difficulties

With reference to the fourth question of this research, two content analyses were implemented in order to separately identify; on the one hand institutional and job-related senses and on the other hand educational and didactic meanings of the aforesaid difficulties and concerns.

IV.4.1. Institutional and job-related significations

Concerning the subject of forestry admin state of affairs the, the subject of responsibility ethics and the sense of duty indicate that the Syrian forestry sector has a lack in employment ethics; this could be perceived through the part of speech concerning the disrespect of professional duties, the expansion of indifference, the administrative corruption, and the morals declination. Institutionally, the subject of the decision-making capacity reflects not only difficulties in implementing mono-disciplinary abilities for resolving multidimensional problems, but also the centralization of institutional decisions and the existing of negative administrative conduits such as obtaining job opportunities through contact. With reference to the topic of honesty, the analysis outputs indicate that the Syrian forestry sector is suffering an administrative corruption and a morals declination in addition to an emergence of negative conduits and values such as bribery, misuse, and personnel recruiting through contacts, etc. As a final point, the analyzed speeches about the need for a clear forest policy and a long-term forestry planning reflect the absence of applicable national forest policy and the non-planned forestry activities.

With reference to the forest engineer professional quality, the interviewees' speeches about the continuous training and the long-life learning issue reflect the absence of in-service training and continuous learning programs beside to the weakness of professional and technical awareness sets. The subject of specialization and professional experience reveals that forestry sector suffers a deficiency in infield practical skills; this translate a weakness in applying theoretical abilities in the real field and difficulties in implementing mono-disciplinary abilities in front of complex matters. Finally, the subject of teamwork skills issue reflects the dispersed character of Syrian forestry sector activities and this means that Syrian forestry staffs' practices are more individual than collective.

Concerning the career practice concerns, the discourse about the socio-economic knowledge and skills reflects not only the existence of a big number of real conflicts in forestry sector, but also the centralization of decision-making process and the divergence between forestry legislations and forest neighbors needs and interests. The subject of infield skills reflects difficulties in implementing theoretical knowledge in the real field. Finally, the subject of patience value reflects the

toughness and roughness nature of the career of forest engineer in addition to the high rate of forestry conflicts.

To sum up, Syrian forestry sector is suffering from the decision-making centralization, the divergence between forestry legislations and forest neighbors' needs and interests, the absence of applicable national forest policy, and the non-planned and dispersed actions: forestry practices are more individual than collective. Syrian forestry staffs encounter a high rate of forestry conflicts, a weakness in applying theoretical mono-disciplinary abilities in front of complex matters and multidimensional problems, and a deficiency in in-service training and technical extension. Critics were implicitly and explicitly expressed towards the administrative corruption and the moral declination of their professional milieu. Accordingly, forestry sector is enduring a lack in employment ethics respect, an expansion of the unresponsiveness, and an emergence of negative conduits and values such as bribery, misuse, and personnel recruiting through contacts, etc.

IV.4.2. Educational and didactic significations

Concerning the subject of forestry admin state of affairs, the subject of responsibility ethics and the sense of duty reflects an educational failure concerning the civic education values, a lack in employment ethic acquisition, the absence of semi-contractual training in forestry educational institutions, and the automatic employment of new graduates by governmental sector. The interviewees' speeches concerning the decision-making capacity reflect the mono-disciplinary approach of teaching-learning process in forestry educational institutions. The subject of honesty value reflects a lack in teaching employment ethics. As a final point, the analyzed speeches about the need for a clear forest policy and a long-term forestry planning reflect the mono-disciplinary approach of teaching-learning process and the lack in infield communicative activities.

With reference to the forest engineer professional quality, the interviewees' speeches about the continuous training and the long-life learning issue reflect the non-development of specific courses or stages for the in-service training of forest engineers. The subject of specialization and professional experience reveals that the forestry educational institutions focus on theoretical aspects more than practical assignments and adopt a mono-disciplinary approach in teaching; this

subject reflects also the absence of partnerships and the insufficient cooperation between forestry educational institutions and other socio-economic sectors particularly those considered as a plausible employment sites for their graduates. To end with, the subject of teamwork skills issue reflects the non-acquisition of teamwork related skills and the insufficiency of collective practical assignments within forestry educational institutions.

Concerning the career practice concerns, the subject of socio-economic knowledge and skills reflects the insufficiency of forestry socio-economic aspects teaching in forestry educational institutions. The subject of infield skills reveals that forestry educational institutions focus on theoretical aspects more than practical assignments through their teaching. And finally, the subject of patience value could reflect the insufficient cooperation between educational institutions and other socio-economic sectors.

In brief, forestry educational institutions focus on theoretical aspects more than practical assignments neglecting forestry socio-economic and communicative aspects, teamwork skills, employment ethics, and professional values. The analyzed discourses reflect not only an educational failure concerning civic education but also an official disrespect of specialized competence through the automatic employment of new graduates by governmental sectors. Forestry educational institutions have not developed specific courses for the in-service training of forest engineers and have not as well developed any partnerships with their graduates' plausible employment sector.

IV.5. Forestry professional values as per discourses

With reference to the fifth question of this research, the content analysis of the written interviews has led to the identification of seventeen forestry professional values: the patience, the open-mindedness, the precision, the adaptation, the practicality, the assiduousness, the tolerance, the cooperativeness, the seriousness, the organization, the complexity, the realism, the self-trust, the relativism, the modesty, the truthfulness, the trustworthiness.

Regarding their social functions, the identified values could be regrouped within four levels:

1. Values related to the personality of forest engineer (adaptation, assiduousness, and self-trust).
2. Values imposed by the fieldwork and teamwork needs (cooperativeness, open-mindedness, organization, tolerance, practicality, and seriousness).
3. Values imposed by the forestry career subject (complexity, patience, precision, realism, and relativism).
4. Values related to the general civic education (modesty, truthfulness, and trustworthiness).

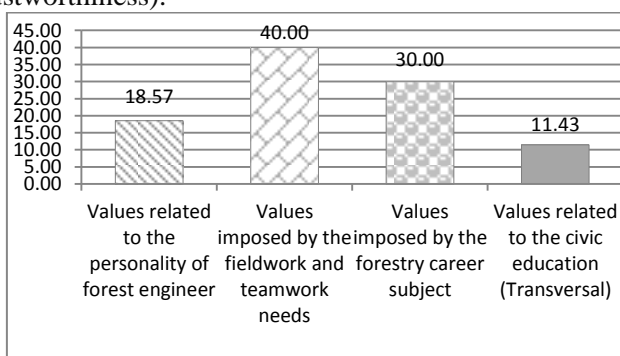


Figure 1 – The presence percentage of identified groups of values

Considering the presence percentage of each group of the identified values, it seems that the interviewed staffs are highly preoccupied by the group of values imposed by the fieldwork and teamwork needs (cooperativeness, open-mindedness, organization, tolerance, practicality, and seriousness); this reflects not only the importance of these values for their career daily practices, but also their observations of these values declining in forestry work environment; as they expressed by the lack feeling about their educational hopes and desires.

In fact and considering their job-related functions, values such as those related to the personality of forest engineer or those imposed by the forestry career subject evoked of by the interviewed staffs could be logically accepted as related to the career of forest engineer; but in contrast, values of modesty, truthfulness, and trustworthiness are strangely appeared through the analyzed discourses as specifically related to the career of forest engineer while they represent a kind of general widespread civic values and not limited to any given career; this indeed

reflects a negative impression of interviewees about the moral dimension of Syrian forestry work environment.

To sum up, four groups of values have been identified: the first is related to the personality of forest engineer, the second is imposed by the fieldwork and teamwork needs, the third is imposed by the forestry career subject, and the fourth is related to the civic education. Despite their importance for forestry career daily work, these values are paradoxically in recession within the Syrian forestry context. Curiously and considering their job-related functions, the three first groups of values could be logically accepted as professional values of the career of forest engineer; in contrast, values of modesty, truthfulness, and trustworthiness are strangely appeared through the analyzed discourses as related to the forestry career while they represent widespread civic values and not limited to any given career; this indeed provides a negative impression about the moral dimension of Syrian forestry sector.

IV.6. Institutional, job-related and educational significations of evoked values

With reference to the sixth question of this research, the institutional and job-related senses and on the educational and didactic meanings could be exposed as follows:

IV.6.1. Institutional and job-related significations

Through their speeches, the interviewed forestry staffs have focused on values such as the adaptation, self-trust, and assiduousness; this professionally translate the infield multidimensional confrontation due to the big number of socio-economic conflicts and the deficiency in technical extension and in-service training activities. Values such as cooperativeness, open-mindedness, organization, tolerance, practicality, and seriousness were also present within the interviewees' speeches; this translate not only the complexity of forestry works, the diversity of forestry stakeholders, and the lack of well-organized forestry plans, but also the difficulty in investing theoretical competences in the field and the lack in teamwork skills and employment ethics. Concerning the values of Complexity, patience, precision, realism, and relativism, the analyzed corpus indicate that forestry staffs find difficulties in implementing their infield forestry tasks and practices due to the diversity of encountered forestry problems, job-related and socio-economic conflicts in addition to a specialization problem and a lack in employment skills. Finally, the

values of modesty, truthfulness, and trustworthiness reflect the deficiency in employment ethics and the presence of corruption in forestry administration.

In brief, the complexity of Syrian forestry works is intensified due to the absence of well-organized forestry plans, the diversity of Syrian forestry stakeholders and their socio-economic conflicts, the emergence of corruption in forestry administration, and a deficiency in technical extension and in-service training activities. Syrian forestry staffs find difficulties in working through teamwork style and in investing theoretical knowledge for facing multidimensional problems; they criticized the disrespect of specialization in staff recruiting and the ethical deficiency of their professional milieu.

IV.6.2. Educational and didactic significations

Educationally, the speech of interviewed forestry staffs concerning values such as Adaptation, self-trust, and assiduousness reflects the insufficiency real-life training on communicative skills and a deficiency in long-life learning skills and continuous learning activities. Values of cooperativeness, open-mindedness, organization, tolerance, practicality, and seriousness reflect the lack in collective training projects and infield real-life practices, the lack in teaching socio-economic skills and long-term plans skills, and the insufficiency in teaching employment ethics and long-life learning skills; and this translates that theoretical teaching is more emphasized in comparison with practical knowledge in forestry educational institutions. With reference to values such as complexity, patience, precision, realism, and relativism, the analyzed interviews reflect the lack in teaching socio-economic and communicative skills, the lack in teaching long-term plans skills, and the insufficiency in training on real-life projects and long-life learning skills. Finally, values of modesty, truthfulness, and trustworthiness reflect the lack in employment ethics teaching and the non-integration of professional values within forestry education.

In brief, Syrian forestry educational institutions emphasize theoretical teaching more than real-life collective training projects and don't integrate professional values, employment ethics, long-term plans skills, and long-life learning skills within their curricula; this causes a lack in acquiring professional values, socio-economic and communicative skills.

V. Synthesis

With reference to the problematic question of this research about the appropriateness level of the Syrian forestry educational system towards the professional forestry praxis complexity, the answers related to the six determined objectives could be summarized as follows:

The first question outputs revealed that the In-service Syrian forestry staffs have known the infield complexity by praxis through feeling a deficiency in infield practices and various types of skills and values; this means that Syrian forestry educational system is unfit to the subject of this question and thus it needs to be improved through didactically enhancing several subjects.

The second question outputs revealed that the Syrian forestry sector confronts multidimensional situations and unexpected complexity through individual practices done by non-specialists with a deficiency in new technologies to resolve socio-economic conflicts; this indicates that Syrian forestry educational system is unfit to the subject of the second question of this research. As a result, Syrian forestry curricula need to be interdisciplinary revised and technologically updated; teaching and training method should be changed.

The third question outputs showed that Syrian forestry staffs have a big number of job-related difficulties and concerns about forestry admin state of affairs and professional practices; this means that Syrian forestry educational system is unfit to the subject of this question. Employment ethics and professional values need to be integrated within Syrian forestry curricula.

The fourth question outputs revealed that Syrian forestry staffs are facing Institutional, socio-economic complexity and administrative corruption through individual mono-disciplinary theoretical abilities with a lack in in-service training; this means that Syrian forestry educational system is unfit to the subject of this question. Practical training need to be done through teamwork real life projects, and new forestry curricula should integrate employment ethics and professional values.

The fifth question outputs revealed that there is a decline in employment ethics and forestry professional values within Syrian forestry sector; this means that Syrian forestry educational system is unfit to the subject of this question. Recruitment criteria of forestry education staffs should consider forestry professional values and employment ethics.

The sixth question outputs showed that Syrian forestry works represent an intensified case of complexity due to institutional, administrative, ethical, and socio-economic obstacles besides a lack in practical and technical training; this means that Syrian forestry educational system is unfit to the subject of this question. Real-life collective training projects should be emphasized and forestry curricula should integrate employment ethics, professional values, and long-life learning skills.

In order to obtain a holistic vision of this research questions outputs, a succinct description of educational system aptness level was explained according to the perceived forestry praxis complexity features (table 3).

Table (3): The synthesis summary

	Praxis complexity features	Educational system aptness level
The 1st question	Praxis complexity discovered through deficient infield practices and skills.	Unfit; it needs to be improved through enhancing several subjects.
The 2nd question	Multidimensional situations and unexpected complexity faced by a technological deficiency.	Unfit; curricula and training methods need to be interdisciplinary revised, improved and updated.
The 3rd question	Professional practices difficulties and forestry admin situation concerns.	Unfit; curricula should consider employment ethics and values.
The 4th question	Sectorial complexity faced by theoretical abilities and lack in in-service training.	Unfit; practical trainings need to be done through teamwork real life projects.
The 5th question	A decline in employment ethics and values discovered through praxis.	Unfit; recruitment criteria should consider forestry professional values and ethics.
The 6th question	An intensified complexity faced by a lack in practical and technical training.	Unfit; real-life collective training projects should be emphasized.

In brief, it seems that there is a significant gap between the Syrian forestry educational system and the professional forestry praxis complexity. Filling this gap necessitates a curricular revision in addition to the introducing of several reformative modifications and adjustments of teaching and training methods.

V.1. Implication and discussion

The research outputs indicate that the subjects proposed to be educationally enhanced translate somewhat an instrument to face the reality; this could represent not only a kind of identifying missing knowledge described by Fogelman Soulié (1991) as a feeling of complexity presence, but also a praxis outputs according to Gerhardt (1993); the proposed subjects support as well the potential disciplinary fields of learning in forestry identified by Cheikho (2011) and confirm the institutional problems and constraints reported by Martini (2009) concerning forestry sector, and the administrative difficulties identified by Cheikho (2009). With reference to the identified job-related difficulties and specific implicit concerns, this research finding assures the results obtained by Martini (2009) concerning the institutional and governance weakness and the insufficiency of technical capacity of Syrian forestry sector. The finding concerning the identification of professional values proves the pertinence of integrating them not only within the potential disciplinary fields of learning in forestry identified by Cheikho (2011), but also within identification of the career of forest engineer formulated by Cheikho (2012). Concerning the Institutional and job-related significations, the result related to divergence between Syrian forestry legislations and the wide range of forestry stakeholders' multifaceted concerns confirms the deduction of Cheikho and Clément (2002) concerning double complexity of forest and that of Morin (1998) concerning the increasing inappropriateness between the specialized disciplinary knowledge and real problems. The correlation between the centralization of institutional decision-making process and the complexity of forestry work supports the observations of Martini (2009) and Cheikho (2009) concerning the negative impacts of the centralization of planning and decision-making of forestry administration on forestry staffs' actions. The critics concerning the administrative corruption and moral declination in forestry administration confirms the institutional and governance weakness of forestry sector reported by Martini (2009). This research outputs concerning the difficulty in investing their theoretical mono-disciplinary knowledge and methodologies facing complex matters represent a typical example of Gramsci' philosophy of praxis described by Monasta (1993) and prove the pertinence of the idea of Jones (1999) in which the engineering practice is considered as more pervasive with

cross-border practice. These outputs confirm also the deduction of Cheikho (2013) through which he proved that Syrian forestry curricula deal with the term “forest” through a mono-disciplinary scientific approach. Concerning educational and didactic significations, the finding about the tendency of Syrian forestry educational institutions theoretical mono-disciplinary approach prove the lack of the educational complexity considering in Syrian context; the taking of the real complexity into consideration through educational activities was highly focused by several researchers; Cheikho and Clément (2002), Morin (1998), Jones (1999), and Cheikho (2013). The finding concerning the insufficiency of teaching natural catastrophes fronting and related infield skills confirm the result obtained by Cheikho (2013) about theoretical mono-disciplinary approach of Syrian forestry curricula. The output related to the insufficient coordination between Syrian forestry educational institutions and future forest engineers’ plausible sites of employment highlights the importance of the conclusion of Jones (1999) about the increasing pervasive character of today engineering practice and that of Morin (1998) about the multidisciplinary, trans-disciplinary, multi-dimensional character of increasing real problems.

VI. Main findings and Conclusions

Three fields of job-related difficulties and concerns were identified; forestry admin state of affairs, forest engineer professional quality, and career practice concerns. Five subjects need to be enhanced at educational forestry institutions; infield practices and teamwork skills, technologic skills, employment ethics and values, natural forestry catastrophes confronting skills, and judicial and socio-communicative skills.

Four groups of values have been identified: the first is related to the personality of forest engineer (adaptation, assiduousness, and self-trust), the second is imposed by the fieldwork and teamwork needs (cooperativeness, open-mindedness, organization, tolerance, practicality, and seriousness), the third is imposed by the forestry career subject (complexity, patience, precision, realism, and relativism), and the fourth is related to the civic education (modesty, truthfulness, and trustworthiness). Despite their importance in forestry daily work, these values are paradoxically in recession within the Syrian forestry context. Curiously and considering their job-related functions, the three first groups of values could be logically accepted as professional values for

forest engineers; in contrast, values of modesty, truthfulness, and trustworthiness are strangely appeared through the analyzed discourses as related to the forestry career while they are widespread civic values and not limited to any given career; this indeed provides a negative impression about the moral dimension of Syrian forestry sector.

VI.1. Institutional and job-related significations

Due to the divergence between forestry legislations and a wide range of forestry stakeholders' multifaceted concerns, needs and interests, Syrian forestry sector represents an arena of a big number of socio-economic conflicts. Seeing the absence of well-organized strategic forestry plans according to a clear national forest policy, the centralization of institutional decision-making process, the unexpected infield job-related difficulties in addition to the career practices' toughness and roughness nature, the complexity of forestry work is actually highly intensified within the Syrian context.

Implicit and explicit critics were made concerning the emergence of administrative corruption and moral declination in forestry administration; forestry sector is enduring the lack in employment ethics consideration, the expansion of the unresponsiveness and the disrespect of professional duties, the emergence of negative values and conduits such as bribery, misuse, and personnel recruiting through contacts, etc. Other critics were made concerning the disrespect of forestry specialization in staff recruiting; a big number of non-specialists with an agricultural background have been recruited within forestry work-sites. Accordingly, employment ethics need to be correctly reinstalled within this sector.

Syrian forestry staffs find difficulties in investing their theoretical mono-disciplinary knowledge and methodologies facing complex matters and multidimensional problems in the real field; for instance, they stated their deficiency concerning integrated management and forest fire fighting infield skills. Due to organizational, communicative, coordinative, and willing obstacles, Syrian forestry staffs' infield practices are more individual than collective. Syrian forestry staffs stated also their weakness concerning forestry informatics and new technologies related skills; their sector has a deficiency concerning in-service training and technical extension activities.

VI.2. Educational and didactic significations

Through a mono-disciplinary approach, Syrian forestry educational institutions focus on theoretical scientific teaching more than practical assignments neglecting or inadequately considering forestry socio-economic and infield communicative aspects, employment ethics, and forestry professional values; as a result, the forestry field complexity and the functional application of theoretical methodologies are not sufficiently considered through teaching-learning process; e.g., their educational outputs reflect an insufficiency in teaching natural catastrophes fronting and Forest fire fighting skills as well as an insufficiency in teaching forestry related infield informatics skills, forestry legislations and rural and socio-economic of forest. These institutions' educational activities depend on individual practical assignments rather than collective training projects.

There is also an insufficient coordination between Syrian forestry educational institutions and future forest engineers' plausible sites of employment concerning forestry curricular updating, in-service training and long-life learning activities.

Seeing the result concerning ethical critics, this research outputs have noticed also not only an educational failure concerning civic education and its relevant values, but also an official disrespect of specialization and professionalism; the automatic employment of new graduates by governmental sectors proves this statement.

To conclude, forestry praxis complexity is almost unexpected and discovered through facing multidimensional situations and forestry admin internal difficulties; this complexity is intensified due to the dominance of theoretical teaching-learning process, the lack in practical and technical training, and the non-integration of forestry professional values and employment ethics within forestry educational system. In view of that, the aptness level of the Syrian forestry educational system towards the professional forestry praxis complexity seems to be gravely in a low position; the institutional, job-related and educational significations perceived through the interviewed staffs' difficulties, concerns and professional values imply the necessity of curricular revision in addition to the introducing of several reformative modifications and adjustments of teaching methods.

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