

# Cultural Identity and its Relationship to Ecosystem and Green Music

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## 1. Introduction

Cultural identity is associated with the natural ecosystem where the biotic (human, animal, plant) and abiotic (air, water, soil) components of ecosystem interact with each other in an integrated cycle. Cultural identity is affected by the elements of social system such as ancestry, language, skill, population, technology, education and religion (Cheng et al. 2018). Music is considered as a main factor influencing the surrounding ecosystem and thus the identity of individuals and societies is formed. Also, there is a relationship between the ecosystem and the social system where an interaction occurs between ecosystem services and human activities. The connection between music culture and ecology can be dated back to the early 1960s. Music Ecology was used to describe the relationships of music making process to natural phenomena and interactions of human to environment (Archer 1964; Neisser 1976). Also, the acoustic ecology and the echo-muse-ecology were represented as a relationship between music cultures and environmental sounds of birds in the forest (Feld 1994). Consecutively, the sustainability of the biological word “Music Ecology” was illustrated in terms of human cultural forms (Titon 2011).

Several studies have proven that some types of music such as Heavy Metal Music can lead to a significant decrement in the performance of the ecosystem components (Chivukula and Ramaswamy 2014; Lozon and Bensimon 2014).

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This paper aims to present an environment friendly type of music that can enhance the yield of ecosystem in a beneficial way. Green Music as a clean and beneficial source positively affecting the environment has a major role in improving the cultural identity. This new type of music encompasses classical music, meditation music and natural sounds such as those of birds, water and wind. The nature of this music and its properties including melody, rhythm, mixture, tone color and sound intensity contribute in its positive impact on the environment. Three examples of Green Music are analyzed in this study. The characteristics of Mozart's "Sonata for two Pianos in D major, K.448", Mariaged'Amour by Paul de Senneville and the lonely shepherd by James Last are clearly illustrated. In this paper, the effect of Green Music on microorganisms, plant growth, water molecules and human is also discussed. It can reform the water molecules and improve its physical properties, promote the growth of plants and some vegetables as well as the yield of milk in cows, enhance human mood, memory and sports performance, relief human suffer, stress and pain, and support the intellectual social and personal development of children and young people. Accordingly, the relationship between Green Music and cultural identity of societies is promoted. The next sections illustrate the relationship between ecosystem and cultural identity, a description for Green Music, some musical compositions attributed to Green Music, and the effect of Green Music on both ecosystem and cultural identity.

## **2. Ecosystem and cultural identity**

Ecology is the science of interaction between environmental elements concerning biotic (living organisms) and abiotic (non-living things) components. These biotic elements include human, animal and plant, whereas the abiotic components include air, water and soil. Human ecology demonstrates the interaction between people and their environment. In this relationship the environment is considered as a synonym to ecosystem. Although humans are essential part of the ecosystem, it is worth thinking that the interaction between human and environment can reflect the relationship between the social system and the rest of ecosystem. Social system is all about individuals, psychology and social organization that shape their behavior. In an ecosystem, plants as a producer can grow up by absorbing sunlight and carbon dioxide from air during the photosynthesis process. The plant extracts water and

nutrients from soil that provide it with energy required in the growth process. Consecutively, animals and human feed on these plants in a consumption process, whereas they breathe oxygen from air in the respiration process during their life cycle. Afterwards, the decomposition process occurs as a result of the death of living organisms. The decomposer includes different types of bacteria and fungi which convert into minerals, water and gases buried underground to be later used by plants in the photosynthesis process.

The social system reflects everything about people. It includes their psychology, population, and social organization forming their behavior. The social system is a central point in human ecology as different human activities influencing the ecosystem are affected by the society where people live. In the social system, there are different factors affecting each other forming the cultural identity. For instance, knowledge and values include cultural heritage, language, and religion that all together form the identity of individuals and societies. This knowledge is interpreted and translated into actions determining the people's behavior. Also, the nationality, gender and ethnicity race are comprised in the population of the social system. The social organization specifies the accepted behavior and the possibilities of our actions. Technology including socio economic status can be developed by both people's behavior and their social organization. In this regard, the elements of the social system can determine the cultural identity of individuals and societies.

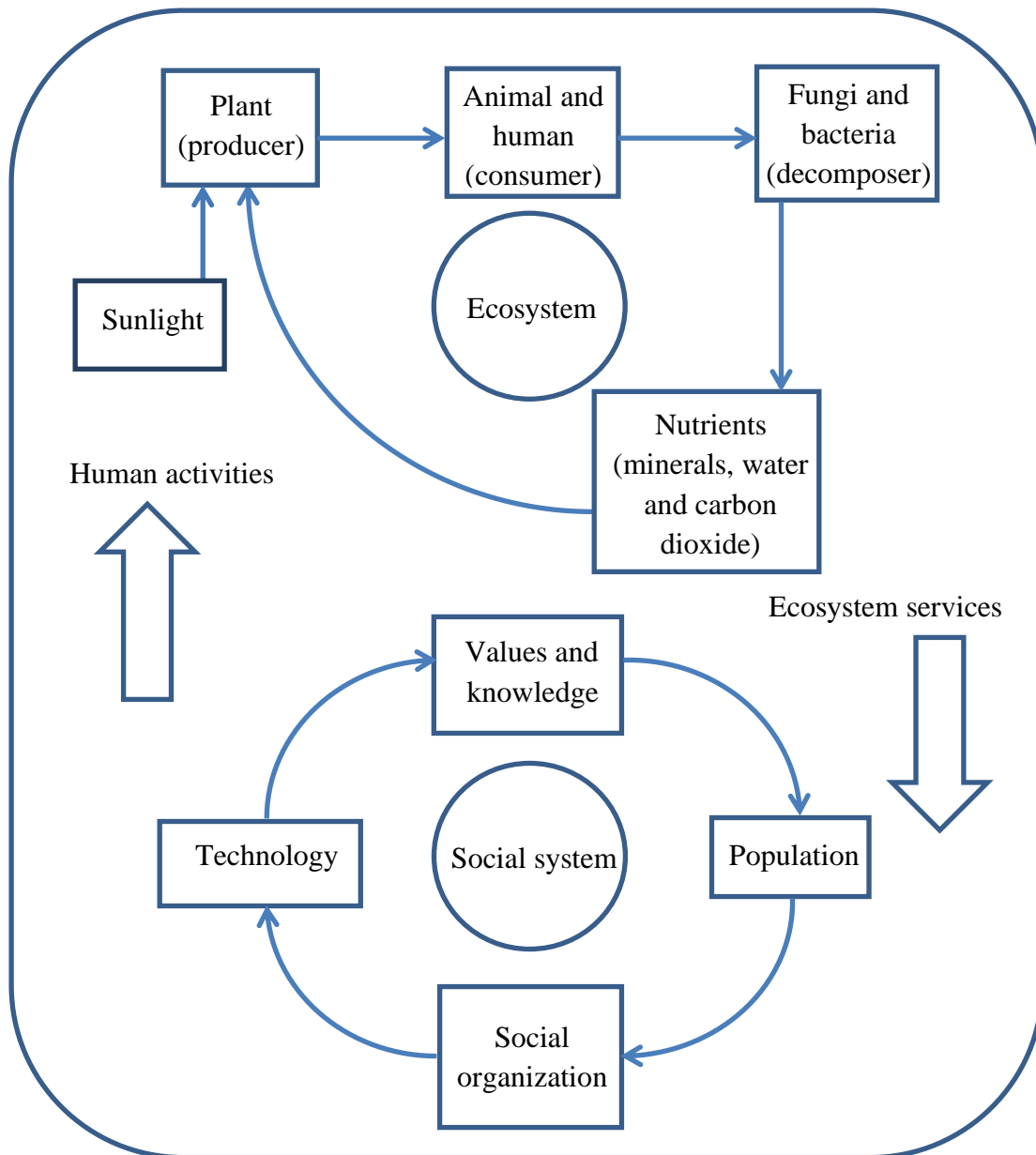


Fig.1. A schematic diagram for the relationship between Ecosystem and social system

Both ecosystem and social system interact with each other as shown in Fig.1. Ecosystem services are provided to the social system where energy, materials and information are moved to the social system to achieve people's needs. These services comprise water, food, fuel, construction materials and others. Simultaneously, human activities are transferred from the social system to the ecosystem with energy, materials and information. These activities occur

through the reuse and reorganization of different resources in an ecosystem using machines or human labor. The information is then transferred from social system to ecosystem.

## **2. Description of Green Music**

Several environmental factors play an important role in forming our life (Xiujuan et al. 2003). Among those, audible sound is widely distributed in the surrounding environment. Music is produced by the interaction of different sound elements in a specific way. These elements are pitch (tone), volume (frequency), intensity, duration, dynamics, tempo, timbre, texture and structure (Mortazavian 2012). Sound wave can be transmitted in the ecosystem through a medium, which is air. Sound can be classified into infrasound of frequency less than 20Hz, audible sound of frequency varying between 20-20000Hz, and ultrasound of frequency exceeding 20000Hz. It is worth mentioning that microorganisms use sound waves in their intercellular communication which indicates the essential role of sound waves in forming the cellular system in living organisms (Reguera 2011) and biological systems (Shaobin et al. 2010). In this regard music significantly contributes in the construction of human ideas, feelings, emotions which reflects the behavior of individuals and societies. Green Music commonly comprises classical music accompanied with some natural sounds such as those of birds, insects, water and wind. This type of music can be considered as an innovative approach due to its beneficial impact on the ecosystem. Green Music emits sound waves of environmental friendly frequencies improving the performance of the surroundings.

## **3. Examples of Green Music**

It is important to shed light on the major characteristics of classical music. Melody construction is considered to be an essential feature of the classical music, as it is common to use regular phrases with regular time signature. Melodies regularly constitutes of eight bar phrase which can be equally divided into two four bar sections. The reason behind the positive effect of classical music is the harmony accompanied to the composed melodies (Wildridge 2018). There is a clear polarity in using the tonic chord (I) and dominant (V) chord. This allows several classical composers to develop new structural form named

“Sonata form”. It consists of three main sections namely the exposition, the development and the recapitulation. Two contrasting themes based on the tonic and the dominant are presented in the first section “exposition”, whereas the second section “development” reflects the composer’s skills in exploring melody, rhythm, texture, harmony of each theme. In the last section “recapitulation”, the same themes restated and reworked.

### **3.1. Mozart’s “Sonata for two Pianos in D major, K.448”**

One of the most famous composers in the classical period is Mozart. He composed a “Sonata for Two Pianos in D major, K. 448” as reported by Adawy (2012) who shed light on the Phenomena called “Mozart Effect”, trying to understand the properties of this sonata and analyze it, to find out why it has such positive effect on cognitive abilities for children and intellectual skills for brain. According to Adawy (2012), the following results are concluded. The form and melodic construction of this music is characterized by short clear regular melodic statements. Also, it has repetitive musical statements, repetitive musical patterns. Its melodies are basically based on tunes from fundamental chords I, IV, V. The Music Cadences are basically based on a pattern of descending melodic sequence. It has a clear melodic base line and accompaniment harmonic chords to the bass line.

It has a regular harmonic rhythm in general using traditional functional harmony based on fundamental chords for the Tonic I Scale & Dominant V. Also, the altered chords are not excessively, especially during modulation from the fundamental tonic scale to the dominant scale. Moreover, it has a descending melodic sequence before the last cadence using dominant preparation. It has a clear, simple, regular rhythm using syncopation and one Tempo all over the whole musical piece. It is recognized by using one time signature all over the whole musical piece and homophonic texture in general.

### **3.2. Mariaged'Amour by Paul de Senneville**

Mariaged'Amour is a beautiful piano piece composed by French pianist Paul de Senneville. This piece can be attributed to the romantic era that is affected by Chopin’s musical style. It is commonly distinguished by a simple smoothing

melody that conveys calming and relaxing softness. Also, it is characterized by its sentimental expression that contains kaleidoscopic pattern of moods. It is composed in the key of G minor where time signature changes from 4/4, to 5/4 and 3/4, and back to 4/4. The chord progression of this piece is Gm–Cm–F–B $\flat$ –D. This wonderful music is full of great elegance and romanticism.

### **3.3. The lonely shepherd by James Last**

The Lonely Shepherd is composed by James Last and played by Gheorghe Zamfir on Pan Flute. It can be considered as meditation music due to its power to soften emotions. Its melody implies the natural soothing soundscape that is associated with human signals relaxation (Gonzalez–Valero et al. 2019). It is recognized by its calming properties and consistency in composition. It is almost hypnotizing while being played. It is characterized by a definite time period of about 20 minutes that can cultivate the pure awareness of mind. It doesn't require additional effort by the listener. It is important to know that the effectiveness of meditation music is related to a minimum mp3 compression of 256 Kbps.

## **4. Green Music and Ecosystem**

After illustrating the interaction of ecosystem with cultural identity and a description for Green Music including three musical examples, the effect of Green Music on the elements of ecosystem will be discussed in the next subsections.

### **4.1. Effect of Green Music on microorganisms**

It is evident that some sonic waves have a significant effect on the growth of microorganisms during fermentation of Yoghurt (Mohammadi et al. 2018). A mixed culture of different microorganisms is exposed to sound waves of intensity of  $75\pm 5$  dB and frequency fluctuating between 30-18000 Hz. A decline in the pH value is recognized causing acidity and an increase in redox potential and thus fermentation of yoghurt occurs. In this regard, the green music waves can be defined in terms of sound waves intensity and frequency. This music has

a beneficial effect on the cell activity and metabolism of fermenting microorganisms. Accordingly, it reduces the viable counts of these microorganisms and the incubation time as well. In addition, some types of classical music comprised of 41-645Hz frequency range reveal a better effect on microbial growth and metabolite production. This music can promote the bacterial pigments production and enhance the growth of different species of bacteria and yeasts (Sarvaiya& Kothari 2017).

#### **4.2. Effect of Green Music on plant growth**

Several studies show that the growth of plants is affected by sound (Creath& Schwartz 2004). Plants can also respond to different types of music according to the emitted wavelength. Exposure to pure tones can lead to the occurrence of optimum plant growth. This is due to the coincidence of music wavelength with major leaf dimension (Collins & Foreman 2001). Some sound vibrations can stimulate different species of plants. In particular, the shoot length, internode length, number and diameter of the flowers are either positively or negatively affected by the type of music being played. Regular sound tones and frequencies can increase the rate of sprouting of plant seeds while random noise has an opposite effect (Pixton 1977). It was recognized that the density of leaves, the health of plants and the number of flowers was promoted while being exposed to Green music (classical music and natural sounds such as those of birds, insects, water, etc). The reason behind this fact can be attributed to the elevation of polyamines level and the increase of oxygen uptake (Qina et al. 2003). Classical or meditation music enhances the growth of plants. Classical music has a gentle vibration that plants can enjoy. Specific musical instruments especially violin music has a significant positive effect on plant growth.

On the other hand, hard-core vibrations of some types of music could negatively affect plants. For instance, Heavy metal music can wreak havoc on plants. Even played at a low volume, it can damage a sensitive plant. Also, the plants exposed to rock music bent away from the music source, tended to a decrement in the size and the number of flowers, and thus reached its wilting point (Chivukula&Ramaswamy 2014). Moreover, it was reported that the growth of *Chrysanthemum callus* was enhanced under a sound wave of 100dB and 800Hz. In addition, moderate stress stimulation could enhance the tissues and



cells assimilation, improve the physiological activity of roots and accelerate the growth of plant (Yiyaoa et al. 2002).

### **4.3. Effect of Green Music on water**

Water is considered to be one of the basic components of ecosystem. It forms about 70% of the earth's surface, whereas about 55% to 78% of the human body is water. A study of the nature and properties of water is significantly essential for living organisms and life on earth. Accordingly, any change in the pattern or structure of water molecules can cause a change in the ecosystem (Ans 2012). Sound waves play an important role in exploring the characteristics of water and its shape. It is worth mentioning that water also has a unique concept namely crystalline memory as reported by the Japanese researcher Dr. Masaru Emoto in his famous book "The message from water". Several experiments were performed by Masaru Emoto & his team in order to investigate the response of water to music. Different factors related to music such as volume, distance, genre and duration can impressively affect the water formations. In his book "The message from water", Emoto examined the crystals of water being imposed to two different types of music namely heavy metal and healing music. The response of water to heavy metal music revealed an irregular and destructive shape of crystals, whereas the healing music showed regular and beautiful water crystals. Moreover, some songs and symphonies produced great water crystals. Among those are Beethoven's Ninth symphony, John Lennon's Imagine, and Amazing Grace. In this regard, these songs and symphonies can be considered as Green Music due to its positive effect on water molecules.

### **4.4. Effect of Green Music on human**

Music has several effects on human body. In particular, some types of music can speak directly to the body moving to the beat and rhythm. Others can touch the emotions and affect the mental and the psychological state. Several studies have shown that music plays an essential role in relieving pain, and reducing anxiety and stress. As reported by Adawy (2005), there is also a relationship between music and brain functions. Different music being played can reflect either positive or negative effect on human beings. Among those, classical

music, meditation music and music accompanied by natural sounds like birds, water, insects ...etc. can be attributed to Green Music for its positive effect on human. Several studies have reported that Sonata Mozart being classified as classical music can improve the cognitive abilities and activate the neural connections that enhance all areas of brain (Adawy 2012). Mozart Effect extends to stimulate brain functions responsible for motor control, language, emotions, intellectual skills, and cognitive and social functions. Moreover, Green Music can be used for treatment of patients suffering from dementia, autism and epilepsy. Furthermore, Green Music leads to better resonance, synchronization and coordination between the two halves of human brain. That can be attributed to stimulating the corpus callosum connecting the two halves of the brain. On the other hand, Hardcore and heavy metal music have a negative effect on human that can be attributed to the anarchy and destruction of this type of music (Reddick and Beresin 2002; Lozon and Bensimon 2014).

## 5. Conclusion

Green Music can be considered as a mirror for cultural life where the performance of ecosystem can be improved in a chain that promotes the identity of individuals and societies. The clear interaction between ecosystem and social system ensures the significant effect of Green Music on both ecosystem and cultural identity. Three musical compositions concerning classical and meditation music were investigated to reveal the predominant characteristics of Green Music. Some elements of this music such as melodic structure help in improving the nature of ecosystem. This new clean music can also lead to a sustainable development in the ecological life. It enhances the growth of plants and increases the yield of milk in cows. In addition, it stimulates the microorganisms in a way beneficial towards the environment. Moreover, it promotes the human behavior and improves the physical properties of water molecules. In this regard, the Green Music positively affects the cultural identity in an ecosystem that promotes the self-development and thinking skills of individuals and societies.

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## **Cultural Identity and its Relationship to Ecosystem and Green Music**

### **Abstract**

Cultural identity is a dynamic changeable process that is significantly associated with the natural ecosystem. The biotic (human, animal, plant) and abiotic (air, water, soil) components of an ecosystem affect each other in an integrated cycle where the behavior of living organisms and their formation are reflected. The relationship between music and cultural identity can be revealed within the framework of the ecosystem. Accordingly, music is an essential part of identity process as it constructs human ideas, individual feelings and emotions, and contributes in forming different cultures. Different types of music have either positive or negative effect on the surrounding environment. While there are negative effects that have appeared by Heavy Metal Music causing tension and depression, the researchers try to find a friendly alternative to environment. Green Music as a clean and beneficial source positively affecting the environment has a major role in improving the cultural identity. This new type of music encompasses classical music, meditation music and natural sounds such as those of birds, water and wind. The nature of this music and its properties including melody, rhythm, mixture, tone color and sound intensity contribute in its positive impact on the environment. It can reform the water molecules and improve its physical properties, promote the growth of plants and some vegetables as well as the yield of milk in cows, enhance human mood, memory and sports performance, relief human suffer, stress and pain, and support the intellectual social and personal development of children and young people. Thus, the Green Music affects the cultural identity in an ecosystem that promotes the self-development and thinking skills of individuals and societies.

**Keywords:** cultural identity – Ecosystem – Green Music – positive effect.

## الهوية الثقافية وعلاقتها بالنظام البيئي والموسيقى الخضراء

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الهوية هي عملية ديناميكية متغيرة بفعل التحولات والمستجدات الحضارية والمجتمعية و ترتبط الهوية الثقافية ارتباطاً وثيقاً بالبيئة الطبيعية المحيطة بنا، حيث تعيش الكائنات الحية (الإنسان-الحيوان-النبات) والكائنات غير الحية (الهواء - الماء - التربة) فى نظام بيئى متكامل يؤثر فى بعضه البعض. و يظهر هذا التأثير على سلوك الكائنات الحية وتكوينها. ويوجد علاقة وطيدة بين الموسيقى والهوية الثقافية فى إطار النظام البيئى ، و تُعد الموسيقى شقاً رئيسياً فى عملية بناء الهوية ، فهى تعمل على بناء بعض الأفكار لدى الأفراد، و كذلك تؤثر على المشاعر و العواطف الإنسانية و تساهم فى تشكيل سلوكيات الثقافات المختلفة. و تختلف أنواع الموسيقى من حيث تأثيرها الإيجابى أو السلبي على البيئة المحيطة بما تحوى من كائنات حية وغير حية. فبعض الأنواع من الموسيقى مثل Heavy Metal Music لها تأثير ضار و سلبي على الإنسان ، و يرجع ذلك إلى كونها مثيرة للقلق و تُسبب العصبية و الإكتئاب. و بناءً على ذلك يهدف هذا البحث إلى إيجاد بدائل موسيقية صديقة للبيئة.

و تعتبر الموسيقى الخضراء "Green Music" هى أحد تلك البدائل المبتكرة التى لها تأثير إيجابى على البيئة المحيطة. و يُعد هذا النوع من الموسيقى صديقاً للبيئة لما يتمتع به من فوائد نظيفة غير ضارة بالبيئة ، ولها دور كبير فى تطوير الهوية الثقافية. و تضم الموسيقى الخضراء بعض أنواع من الموسيقى منها الكلاسيكية Classical Music ، و التأملية Meditation Music ، و الموسيقى التى تقوم على الأصوات الطبيعية للطيور و المياه و الرياح...إلخ. فطبيعة هذه الموسيقى بما تتضمنه من سمات وعناصر موسيقية تشمل اللحن و الإيقاع و النسيج و اللون الصوتى و شدة الصوت يكون لها أثر إيجابى على البيئة. فالموسيقى الخضراء تعمل على إعادة تشكيل جزيئات المياه وتحسين خواصها الفيزيائية ، كما تساعد على تعزيز نمو النباتات و بعض المحاصيل الزراعية و زيادة إنتاجية

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اللبن عند الأبقار بالإضافة إلى ذلك فإنها تعمل على تحسين الحالة المزاجية للأفراد وتقوية الذاكرة والأداء الرياضى ، كما تساهم فى علاج مرضى الصرع والضغط العصبى وتقليل الشعور بالألم. علاوة على ذلك، فالموسيقى الخضراء تساعد على زيادة نسبة الذكاء والنمو الذاتى والإجتماعى لدى الأطفال والشباب. ومما سبق نجد أن الموسيقى الخضراء تؤثر على الهوية الثقافية فى نظام بيئى داعم لعملية التطور والنمو الذاتى للأفراد والمجتمعات و تحسين مهاراتهم و قدراتهم مما يؤدى إلى شكل مميز من التطور الفكرى والثقافى للشعوب.

**الكلمات المفتاحية:** الهوية الثقافية - النظام البيئى - الموسيقى الخضراء - التأثير الإيجابي.