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## Environmental Sustainability: From Communication perspective

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### Abstract

The real development would be achieved only when all of Social, cultural, economic and political sectors are developed simultaneously. Different programs related to these sectors are implemented via a communicative process. In this process, the development agents send some messages as new technologies to customers via some media. Furthermore, beyond this communicative process, development programs should meet environmental concerns too. This paper based on an analytic research method conducted to explain Rural Environmental Sustainability from communication changes perspective. If we suppose a communication model consists of some components such as sender; message; media; receiver and feedback system, to reach environmental sustainability in rural areas, all of them should be changed in one way or another. For example, about organizational part as senders; decentralization, privatization, activation of NGOs, and customers' sharing in costs of development programs should receive enough attention. Customers or receivers; rural women, youth and poor should be putted first. Media: using interactive media such as folk media and new information technologies are recommended. For Feedback- evaluation system; participation and empowerment of rural people should be considered. The content of messages; environmental considerations such as preserving living diversity in one hand, and minimizing the usage of un-renewable/ natural resources, pastures, chemical materials, air, water and land pollutions, and erosion in the other hand should be considered. Furthermore, with regard to holistic view, environmental problems should be considered in parallel to social systems. So, social elements such as decrease the rate of migration from rural areas; social gap; improving people's income, employment, housing and educational opportunities; providing communicative infrastructures and stability of cultural patterns are really important in the process of Rural Environmental Sustainability. This article has investigated and analyzed the above components and it has also introduced an alternative communication model for rural areas' sustainability.

**Keywords:** Communicative Models, Sustainability, Sustainability of Rural Environments.

### پایداری زیست محیطی: از چشم انداز ارتباطی

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### چکیده

برای تحقق توسعه واقعی، باید بخش‌های اجتماعی، فرهنگی، اقتصادی و سیاسی یک کشور به موازات یکدیگر توسعه پیدا کنند. زیرا فرآیند توسعه از طریق اجرای برنامه‌ها و پروژه‌های در بخش‌های فوق امکانپذیر است. این فرآیند را می‌توان یک فرآیند ارتباطی دانست. زیرا طی آن عاملان توسعه بخش‌های مذکور، با استفاده از روش‌های ارتباطی و اطلاع‌رسانی، برنامه‌های مورد نظر خود را به مخاطبان خویش منتقل می‌کنند. علاوه بر ماهیت ارتباطی، در اجرای برنامه‌های توسعه، توجه به پایداری محیط زیست نیز ضروری است. لذا مطالعه حاضر با کمک روش پژوهش تحلیلی و مرور داده‌های ثانویه به تبیین ضرورت تحول الگوهای ارتباطی برای تحقق پایداری زیست محیطی مناطق روستایی و معرفی الگوی ارتباطی گزینداری برای این منظور پرداخته است. چنانچه یک الگوی ارتباطی را متشکل از فرستنده، پیام، رسانه‌های ارتباطی، گیرنده و نظام بازخورد بدانیم، برای تحقق پایداری زیست محیطی مناطق روستایی، تحول در اجزای الگوهای ارتباطی برای این منظور ضروری است. برای مثال، در زمینه سازمان‌ها (فرستنده‌ها)، تمرکز زدایی، روح خصوصی‌سازی، گسترش سازمان‌های غیر دولتی و دخالت دادن مخاطبان در تأمین هزینه فعالیت‌های توسعه از مهم‌ترین این تحولات می‌باشند. در زمینه مخاطبان (گیرنده‌ها)، اولویت بخشی به زنان، جوانان و فقرا و روستاییان اهمیت بسیاری دارد. استفاده از روش‌های دو سویه، رسانه‌های ارتباطی بومی و رسانه‌های ارتباطی نوین لازم می‌باشد. در زمینه تحول در روش‌های بازخورد و ارزشیابی نیز استفاده از روش‌های مشارکتی و توانمندسازی توصیه می‌شود. بالاخره، در زمینه محتوای پیام‌های توسعه نیز توجه به حفظ سلامت محیط از طریق نظیر تنوع زیستی؛ حداقلی استفاده از منابع انرژی تجدیدناپذیر؛ جلوگیری از فرسایش؛ به حداقل رساندن آلودگی‌های هوا، آب و بافت خاک؛ و کاهش مصرف مواد شیمیایی سموم و کودها، بسیار ضروری می‌باشد. ضمناً، با توجه به دیدگاه تمام‌گرایانه، نمی‌توان محیط زیست را جدا از نظام اجتماعی در نظر گرفت و برای حفظ پایداری زیست محیطی، ضروری است تا عناصر اجتماعی نظیر کاهش نرخ مهاجرت از روستاها، بهبود درآمد افراد، فراهم‌آوری فرصت‌های اشتغال، تأمین مسکن، فراهم‌آوری امکانات آموزشی و زیرساخت‌های ارتباطی، کاهش فاصله اجتماعی و حفظ آنگاره‌های بومی - فرهنگی نیز باید مورد توجه قرار گیرند. مقاله حاضر با بررسی و تحلیل موارد فوق، به معرفی الگوی ارتباطی گزینداری برای تحقق پایداری زیست محیطی مناطق روستایی می‌پردازد.

کلیدواژه‌ها: الگوهای ارتباطی، پایداری، پایداری محیط‌های روستایی.

## Introduction

During the early 1970s, environmental crises spread over the world. On the early 1980s, the World Commission on Environment and Development (WCED) or Burnt-land Commission introduced the concept of sustainability for the first time. Based on this definition, sustainable development (SD) was considered a process that meets the needs and opportunities of current generation without any treatment on future generations. Therefore, it consists of three main assumptions: long-term perspective, inter-generational equity and dynamics of events (Boyazoglu, 1998; WCED, 1987 and Karami, 1995). Grant & Craig (2006) also introduce three main aspects of sustainability as below:

- Benefits: SD must have some benefits in environmental, economic, social and cultural dimensions.
- Intergenerational equity: Leaving a better world for your grand children.
- Incremental: progress is the nature of SD and the difference is the sum of millions of small changes.

They (ibid) also refer that an approach is sustainable if it uses less resources, creates less pollution, meets social needs and make sense financially.

Harlizius, *et al.*, (2004) report that sustainable development has become a priority for the world's policy makers, among others for the G8, an informal group bringing together the leaders of Germany, Canada, the United States, France, Italy, Japan, the United Kingdom, and Russia to discuss a wide range

of political and social issues, especially in the area of sustainable development and global health. The G8 launched their action plan recently in Evian (France): "we recognize the need to support the development of cleaner, sustainable and more efficient technologies".

The process of any development, such as environmental sustainability development, is a communication process, because during this process, development agents transfer information or technologies to customers via communication channels (Shahbazi, 1996; Malek Mohammadi, 1998). This is true for environmental conservation initiatives (Karami, 1995) Figure 1 shows the basic communication process model used by development agents.

Nowadays, the efficiency of this one-way model is under critics. For this reason alternative models that are two-way as well as interactive are suggested. Although the new communication models are different from each other they have still three major components in common which are production, transfer and implementation of introduced information or technologies. One of the most well known and age old communication model is Shannon's General Communication Model. By adding feedback component, it could be used for environment sustainability. Of course, in this article, we ought to adjust this communication model for environment sustainability. Therefore, it is important to introduce a communicative model with regard to sustainability features to guide development agents towards a better success and achievement. Figure 2 shows a theoretical framework used for this purpose in this article.

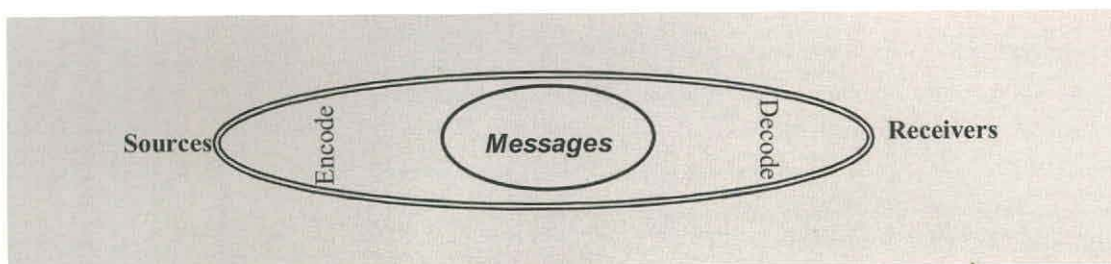


Figure 1- The basic model of communication process (Mc Closhy, 2003 p:3)

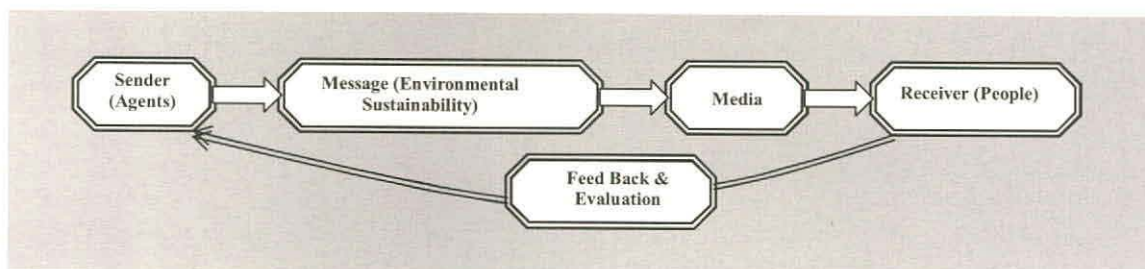


Figure 2- A communication model for environmental sustainability (Based on Shannon, 1948, p: 2)

Based on the above discussion, the aim of this article is to explain communication components to achieve environmental sustainability. So, two objects are followed: First, to explain environmental sustainability and second, to introduce an alternative communication model for environment sustainability.

An analytical research method was used to analyze second hand data. Therefore, different literatures about research topic (environment sustainability and communication) were reviewed to design a proper communication process for environmental sustainability.

### Findings

Based on the above communication model suggested for environmental sustainability (Figure 2), communication components are: Agents as senders; people as receivers; communication channels as media; evaluation and feedback component; and environmental sustainable content as messages. Their perspective for environmental sustainability is discussed as below:

#### 1) Agents (senders)

1-1) Decentralization and democratization of institutional structure: non centralized programs are more fitted to the needs of rural and local communities (Gitta, 2000) introduced by agents for environmental sustainability.

Informative nature of agents: new agents are named as information aged organization by Patton (1993). Because they have some differences with old industrial and colonial age agents. These agents have some characteristics

such as matrix network management that is horizontal and lateral rather than vertical; collaboration; and need for inter- disciplinary and systemic abilities and skills.

1-3) NGOs: Roy (1982) announces that NGOs agents could play a crucial role in the focus of development programs such as environmental sustainability on poor people.

1-4) Intermediate Agents (IA): Wallace (1994) introduces a special organizational structure named IA. IA consists of some local people in one hand and some development officials in the other hand who as agents work collaboratively.

1-5) Private Agents: past experiences have shown that privatization is a good strategy in developing countries. Of course, it must be regard as a long term and continual process. It also should continue in parallel to governmental activities for purposes such sustainability of environment (Hadji Mir-Rahimi and Karami, 1997).

1-6) Local part- time Agents (LPA): Based on Rogers (1992), LPA is a good alternative instead of employing full time staffs who are from other cultures and unfamiliar with local culture and conditions such best way for achieving sustainable environment.

1-7) Budgets: different experiences across the world have shown that if people as change agent be in charge of some programs budgets, for example sustainable environment, the programs' accessibility and success would become more. So, the Cost- Sharing is a proper budgeting procedure for development organizations in sustainability of environment (Steviss, 1988).

2) *People (Receivers):*

2-1) More attention to women and youth: development programs, even conservation of environment, in the past decades had less focus on youth and women. But they have their own importance. I.e. youth are the keys of technology transfer process (Karami and Fanaee, 1995) and women are more important than men in the process of development because they are responsible for a lot of activities such as home economy, child care and some technical activities which can help environmental sustainability (Lahsae-Zadeh, 2000).

2-2) Programs' focus on poor people: Roy (1982) reports that the nature of development programs such as that concern environment conservation is rich-oriented. But a significant shift in this strategy is strongly recommended. It must be focused on poor, because a large portion of country's population is poor people especially in rural communities. people who can not have a hand in share for conservation and finally, sustainability of their environment.

3) *Media (communication channels):*

3-1) Application of Folk and New Media: if communication process consists of entertainment beside education activities, it would become more effective (Olajide & Yahya, 2003; Tufte, 2001; SIFPSA, 2005). So, Folk media such as local exhibitions, ceremonies, dances, songs, memos and demonstrations could offer these features. But new media or information technology are also important in the other hand. Because they facilitate the linkage between peripheral to central areas to do different jobs such as marketing, distance education, conservation of environment and decreasing beurocharcy (Warren, 2002; Rowley and Potterfield, 1998).

3-2) Employment of local volunteer leaders: these leaders could work as a linkage between local people in one hand and development agents in the

other hand (Jones, 2003) for some purposes such sustainability of environment.

4) *Evaluation and feed back:*

Several experiences show that traditional external methods of evaluation and feed back don't work well anymore. Therefore, nowadays participative and internal methods of evaluation such as empowerment evaluation is highly recommended and implemented. Evaluators are considered as facilitators who help participants or people to do evaluation job. According to Fetterman's definition (1997), empowerment evaluation consists of 4 main steps:

- a. Taking stock: the evaluators and participants (evaluation group) define pros and cons of current situation, for example environment conditions.
- b. Setting goals: the group defines aims and purposes of evaluation process collaboratively for programs such as environmental conservation.
- c. Developing strategies: the supposed group sets some strategies to go from step 1 to step 2, for example to conserve environment.
- d. Documentation progress: the group develop indicators or standards to identify whether the program is effective or not, for example for sustainability of environment.

5) *The environmental sustainable content (messages)*

Holmgren (2003) announces that "environmentalism" is a good policy to reach sustainability. He also adds that environmentalism involves both "oppositional" and "developmental" activism. Oppositional activism (OA) discusses about which aims to stop, ameliorate or mitigate adverse environmental impacts, especially of corporations and governments. In contrast, developmental activism refers to the process of constructing the systems which produce positive environmental and social outcomes. These most typically operate at the personal and household

level but include community and entrepreneurial processes.

Developmental activism has received most attention in recent years. It could be named as "third wave of environmentalism". Establishment of a "Perma-culture" (or sustainability culture) is a good strategy to reach sustainability. The first wave of environmental solutions of the post World War II era developed in the late 1970s. The Perma-culture concept and movement were milestones of that "first wave" but Perma-culture action increased dramatically both nationally and internationally during "second wave" in the late 80s and early 90s. Today is the time of third wave of environmentalism and Perma-culture. On this wave, Perma-culture wants to build on rather than break heritages (ibid).

Pearce (2006) refers that three primary objectives emerge in seeking to achieve sustainability for the human species: minimizing consumption of matter and energy; avoiding negative impacts on environmental life support systems; and satisfying human needs and aspirations. She also introduces two models of human technological systems. On the "Linear throughput" model of human technological systems, resources such as forests, fossil fuels, oceans and solar inputs serve as

inputs to model. Entropy is generated by consumption and the residuals are "thrown away" to environment. But in the "Regenerative model" of human technological systems, resources are re-circulated within the consumption process rather than being used only one time and thrown away to environment. Solar input is the regenerator of sources for human technological systems. Thus, it is the ultimate enabling factor for sustainability of the earth system. Regenerative or sustainable system exhibits the following characteristics:

- Operational integration with natural processes, and by extension with social processes
- Minimum use of fossil fuels and manmade chemicals except for backup applications
- Minimum use of nonrenewable resources except where future reuse or recycling is possible and likely
- Use of renewable resources within their capacity for renewal
- Composition and volume of wastes within the capacity of the environment to re-assimilate them without damage.

The above two models are shown on figure 3.

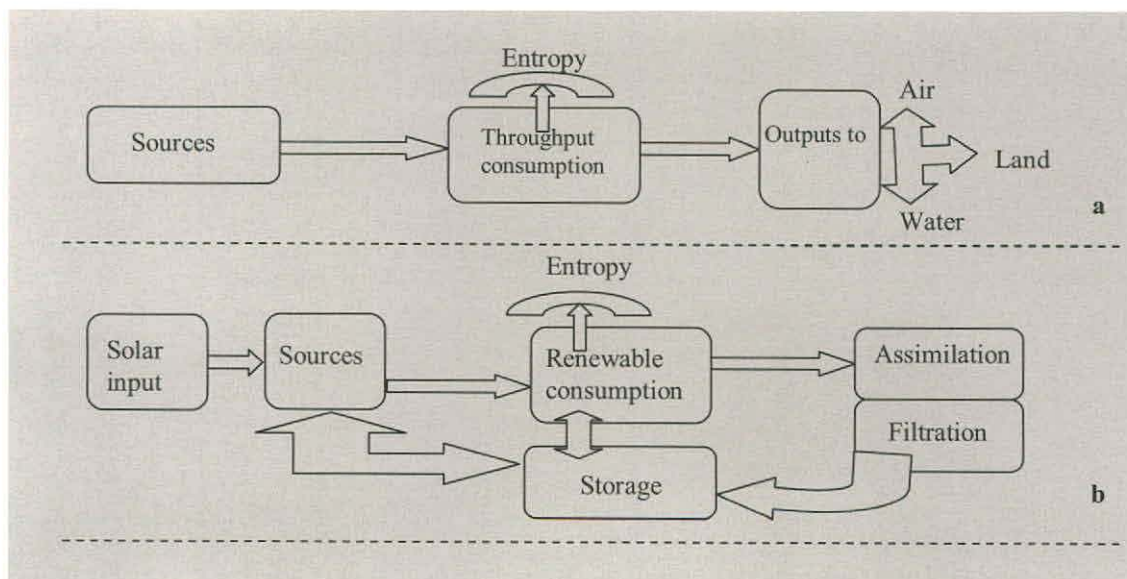


Figure 3: Throughput consumption (a) and renewable (b) models of human technological systems (Based on Pearce, 2006, p: 15)

To implement the renewable or sustainable model, there is a real need to shift from old paradigm of energy consumption (a) to the new one (b). Old and new paradigms of energy consumption are shown on figure 4.

Paliwal (2006) reports, in India changing life styles, increasing pace of urbanization, industrialization and infrastructure development have caused environmental pollution and degradation. Therefore, Environmental Impact Assessment (EIA) has been formally introduced in 1994. It relied on the institutional framework that has a strong supporting legislative, administrative and procedural set-up. EIA framework rests on three pillars of "statutory", "administrative" and "procedural" framework.

1) Statutory framework: environmental management issues came to focus in India, when National Committee on Environmental Planning and Coordination (NCEPC) was constituted in 1972, under Department of Science and Technology. Other acts related to environmental management during past years: Prevention and Control of Water Pollution (1974); Forest Conservation

(1970); Prevention and Control of Air Pollution (1981); making EIA mandatory for particular group of activities (1986); Wastes Management and Handling (1989); and Noise Pollution Regulation and Control (2000).

2) Administrative framework: The existing Environmental Clearance Process is a two-tier system involving both central and state authorities. Central level is in charge of some activities such as setting guidelines; preparing questionnaires and checklists for EIA; collecting, analyzing and reporting different projects' data; monitoring and Evaluation of state level staffs. State level in the other hand, is responsible for formulating guidelines and executing them.

3) Procedural framework: the process of EIA in India consists of following steps:

3-1) Screening: Screening determines whether EIA is required or not. Any project in ecologically fragile areas and any project falling under coastal zone regulation require an EIA.

3-2) Scoping: Scoping identifies the concerns and issues to be addressed for a particular project.

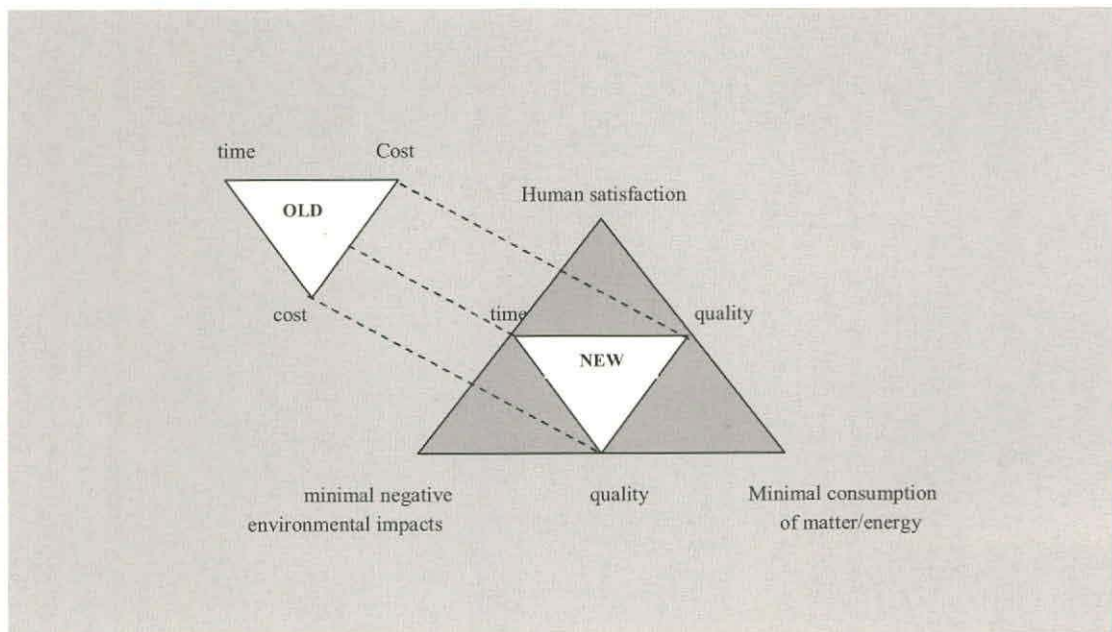


Figure 4- Old and new paradigms of energy consumption (Pearce, 2006, p: 17; Mogge Jr, 2004, p: 111)

Guidelines and review checklists are available for relevant issues for different project types and provide general questionnaires for all the sectors.

- 3-3) Baseline analysis: A comparison of project-induced environmental changes with the expected environmental changes without proposed project is assessed through baseline analysis. The quality of the baseline analysis establishes the viability of the appraisal of the impacts, and therefore of the EIA itself. In India, data is collected on both project engineering and environmental aspects. Project engineering deals with process technology, raw material, water and energy requirements, whereas data on air emissions, wastewater, noise, solid waste and hazardous/toxic waste is required for the environmental study
- 3-4) Impact prediction: Once collecting the relevant environmental information, consequences of the project are outlined. The prediction analysis should forecast the nature and significance of the expected impacts, or explain why no significant impacts are anticipated.
- 3-5) Impact mitigation measures: In an EIA, mitigation measures are proposed to avoid or reduce environmental and social impacts. Environmental Management Plan (EMP), risk assessment report and disaster management plan (if hazardous substances are involved in the project), rehabilitation plan (if displacement of people is anticipated) are prepared to suggest remedial measures.
- 3-6) Documentation: At the end of all the above-mentioned steps, a concise but comprehensive report is prepared. It summarizes the description of the project, regional settings, baseline conditions, impact prediction and important findings of the study.
- 3-7) Public hearing: The Indian system provides an opportunity to involve affected people and vulnerable groups to develop terms of references for EIA thus incorporating their concerns into

decision-making process. The SPCB is required to publish notices for public hearing in two local newspapers and one of which should be in vernacular language of the concerned locality.

- 3-8) Review and decision-making: The review and decision-making starts as the proponent files an application accompanied by the documents i.e., EIA and EMP report, risk assessment and emergency preparedness plan, rehabilitation plan, details of public hearing, clearance from airport authority and state forest departments, etc., to impact assessment board (IA). The IA reviews the report with reference to the guidelines provided by Ministry of Environment and Forests (MoEF) in its manual. The IA is free to conduct site visits if considers necessary. Based on the EIA review and other information, the IA either grants or rejects the environment clearance to the project.
- 3-9) Post Project Monitoring (PPM): The PPM aims to ensure that an action had been implemented in accordance with the measures specified while providing the environmental clearance. Thus, it performs a dual task of identifying the actual environmental impacts of the project and checks if the EMP is having the desired mitigation measures.

All of the above comments show the importance of environmental sustainability. But another more important point is that human is on the center of any development activity. So, the interaction of people and their relations to environment plays a crucial role in environmental sustainability. Therefore, based on holistic view, social aspect of sustainable development should be considered beside environmental aspect (Nikdokht, 2002; Shahvali, 2005; Russel and Harshberger, 2003; Holmgren, 2003; Gafsi, *et al.*, 2006; Newley and Treverrow, 2006; Thompson, 1999). To remind the importance of social aspect of sustainability Piciou (1999) introduces the concept of Environmental Sociology. Based on this definition, in addition to that environmental dimension,

environmental crises have some cultural, political and social dimensions too. So, any modernization process should regard all of these concerns. This ecological modernization is based on these principles: minimizing environmental pollution of industries; integrated pollutants management; mandatory of environmental certification for different industries; cooperation between different organizations for making decisions about development projects.

Meyer (2000) also believes that social aspects can cause a sustainability problem in two ways:

First, social security systems (in particular social insurance) may influence the accumulation of capital stocks, e.g. physical capital or human capital. Since social security instruments' main target are improvement of today's generations' social situation, their inter-temporal effect unfolds only by affecting some kind of capital stock. Therefore, these effects called indirect social sustainability effects.

Second, any political or economic intervention can influence the stock of social capital, yet to be defined. Because the immediate impact on a capital stock, these effects named direct social sustainability effects. Figure 5 shows social aspects of sustainability briefly.

The pension system is designed to warrant a sufficient standard of living to the individual when they retire. Unemployment insurance predominantly influences the accumulation of Human Capital. Finally, if individuals falls ill and is prevented from working or even worse if individuals die early due to bad health care, its HC is missing in production. Therefore, health insurance is so important too (ibid).

Social Capital is quiet unfamiliar in economics and rather adheres to sociological literature. It has two fundamental characteristics: first, it reflects the society's social structure and second, it facilitates the individual's actions. The social capital an individual disposes of is the sum of his social relations weighed according to their strength and frequency of use. Consequently, the society's social capital is the weighted sum of all social relations. So, human capital is within the people and can be owned by individuals. In contrast, social capital is between the people, between the human poles. Therefore, people can employ social capital but they can never own it, since it requires another individual to have human relations and consequently to form social capital. It also can never be accumulated by an individual itself, rather than another individual is required to invest in social

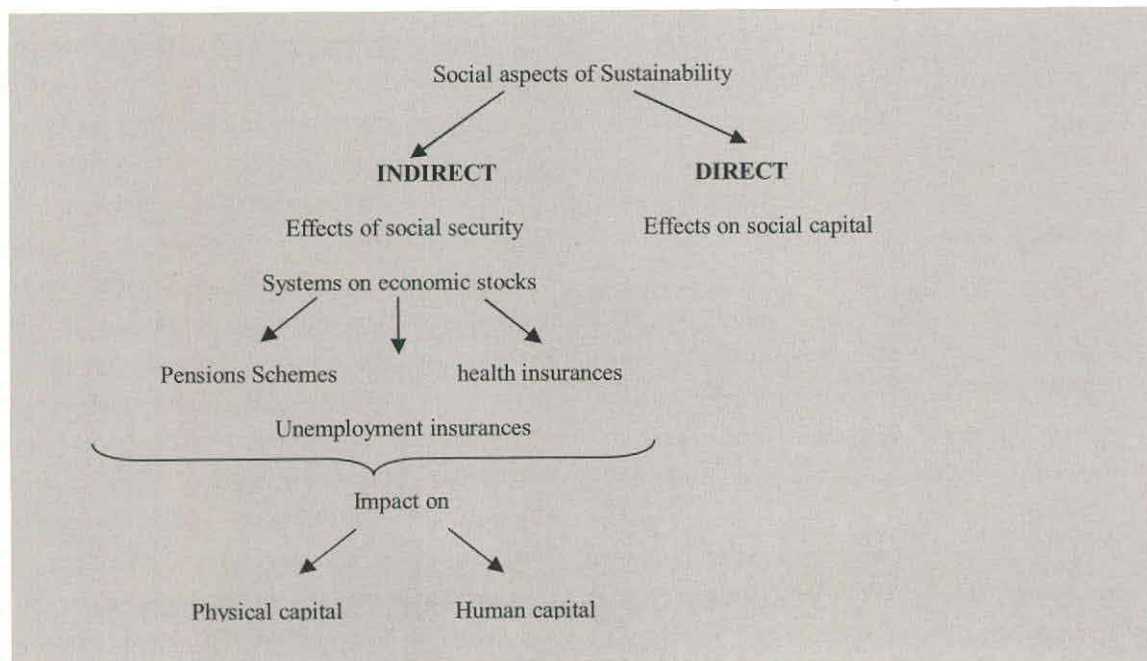


Figure 5- Social aspects of sustainability (Meyer, 2000, p: 6).



capital, i.e., to create or intensify social relations. On the other hand, any individual can destroy social capital by refusing cooperative or dis-intensifying social relations.

Walker and his colleagues (2000) have conducted a field research during the latter half of 1997 in Molas, a coastal village located in North Sulawesi, Indonesia, to human populations of any public or private actions. They've described social impacts as the consequences

that alter the ways in which people live, work and play related to one another, organize to met their needs, and generally cope as members of society. They've also reported from "Gramling and Freudenburg" that six systems can be affected once development plans for an area become public knowledge: biophysical, political/legal, economic, social, cultural, and psychological. These systems are shown on table 1.

Table 1- Examples of how valued components are affected during project anticipation (Walker *et al.*, 2000, p: 518).

Component affected	Aspects of component that can be changed during project anticipation
Biophysical	Anticipated construction; anticipated lack of maintenance and decay of existing structures and facilities; anticipated degradation or improvement of human and/ or biophysical health; unknowns regarding size and context of development growth
Economic	Anticipated alteration of economic system; anticipated distribution of benefits and burdens from development; decline or increase in property values; speculation and investment; "goodness of fit" between development and community
Social	Potential increase or decrease in social opportunities; anticipated maintenance or decay of social cohesion and patterns of interaction; differential construction of opportunities and threats; investment of time, money or energy for support or resistance of project; organizational changes; changes in social stability
Political/ legal	Potential changes in local or other political structures; litigation to stop, regulate or win compensation from project; heightened political claims making; political activities in favor of/ opposed to planned development
Cultural	Perceived potential of development to destroy or preserve culture; anticipated new values needed for altered livelihood; perceived impacts of initial and long- term contact with new development
Psychological	Changes in mental health; increase/decrease to stress, anxiety, anger (through ability to benefit/lose); increase/decrease in perceived efficacy; speed of change and ability to cope; degree of participation/uncertainty regarding development; pressure to conform to dominant attitude regarding the development

The main findings of Walker and his colleagues (2000) were that during the anticipation phase both the quantity and quality of agriculture production on land acquired by speculators and developers decreased, individuals used the income from the sale of their land to build new homes or improve existing ones or to invest in new occupations, exposure to new values and lifestyles made younger people in the village less interested in maintaining traditional values and culture, the local community became marginalized related to planning and development decisions, and considerable fear and anxiety were created for many villagers due to the uncertainty generated by the proposed tourism development.

Gates and Lee (2005) also believe that for a community to function and be sustainable, the basic needs of its residents must be met. A socially sustainable community must have the ability to maintain and build on its own resources and have the resiliency to prevent and/or address problems in the future. There are two types or levels of resources in the community that are available to built social sustainability (and indeed, economic and environmental sustainability): individual or human capacity, and social or community capacity. Individual or human capacity refers to the attributes and resources that individuals can contribute to their own well-being and to well-being of the community as a whole. Such resources include education, skills, health, values and leadership. Social or community capacity is defined as the relationships, networks, and norms that facilitate collective action taken to improve upon quality of life and to ensure that such improvements are sustainable. To be effective and sustainable, both these individual and community resources need to be developed and used within the context of four guiding principles of equity, social inclusion and interaction, security and adaptability. Social sustainability can be understood to be made up of three required components:

1) basic needs of residents can continue to be met through:

- Appropriate affordable housing with flexibility to meet changing needs,
  - Appropriate affordable health care available in the country,
  - Locally produced, nutritious food that is affordable,
  - Jobs that enable people to be productive and utilize their skills and abilities,
  - Sufficient income for people to be able to financially support themselves and their families, and
  - Safe communities and work places
- 2) individual or human capacity can be maintained and enhanced through:
- Opportunities to develop and upgrade skills,
  - A variety of local employment opportunities throughout the region,
  - Opportunities to develop and make use of creativity and artistic expression,
  - Appropriate and affordable formal and informal life-long learning,
  - Appropriate and affordable recreation, leisure and cultural facilities and programs, and
  - A range of opportunities for individuals to contribute to the health and well-being of the community.
- 3) Social or community capacity can be maintained and enhances through:
- Support and encouragement for community economic development,
  - Community "identity" is reflective of community diversity,
  - Involving in public processes and their results in government,
  - Opportunities and places for social interaction throughout the community
  - Opportunities, resources and venues for a variety of arts, cultural and community activities, and
  - Support and encouragement for community organizations and networks.

More than the above comments, some other trends of development process are considerable, because they

could be used in designing an alternative communication process. As it was referred to on the past pages, the communication process should be a two-way and interactive process. So, in fact the nature of development process is communicative-informative rather than just informative (Aarts and Woerkum, 1995; Shahvali, 2003<sup>1</sup>). Aarts and Woerkam (1995) also describe interaction; flexibility, learning process and transparency as four key principles of a communicative- informative process. Furthermore, to cope against continual changes, information should be changed and up-to-dated continually. Communication specialists announce that a strategy to integrate folk and new information media could be effective for this purpose (Wallace, 1994; Engel and Van Der Bor, 1995; Blum, 1996; Guzak, 1997; Althaus & Tewksbury, 2000; Rawan, 2002). Wallace (1994) refers that the Intermediate Organizations (IO) could help us to reach the above structure. IO are some organizations that formed by cooperation between local people and officials. It seems that a structure like IO should be a main component of the alternative communication model that this article ought to introduce.

### Conclusions & Recommendations

Figure 6 shows the schematic model of the alternative communication model for environmental sustainability. This model considers all of the above comments on communication process and new trends. Major components of the above communication

process are:

- 1) An Intermediate Organizations (IO) structure that is the main actor of the process. Forming these associations would facilitate reaching the participation principle of new communication trends for environmental sustainability.
- 2) These IO could facilitate and accelerate the relationship between local people in one hand and official (outriders) in the other hand. Furthermore, using folk media like ceremonies, poems, songs, etc, could help them to be more effective. New information media (IT) also could help them to connect to other specialists and organizations away from village, region or even country.
- 3) Close relationship between IO, local people and outsiders, facilitate giving feed back and doing different evaluation techniques. Therefore, based on mutual relationship between them, both local people and outsiders can be considered as sender and receiver of sustainable environment messages at the same time.
- 4) The most important component in this process is the "content of messages". As it's referred on the past pages and also shown in the figure 6, environmental beside social aspects must be considered in this process. Moreover, based on a holistic view, changes in one component will make the others to change too. So, table 2 shows the changes and related strategies of different component of alternative communication process for environmental sustainability.

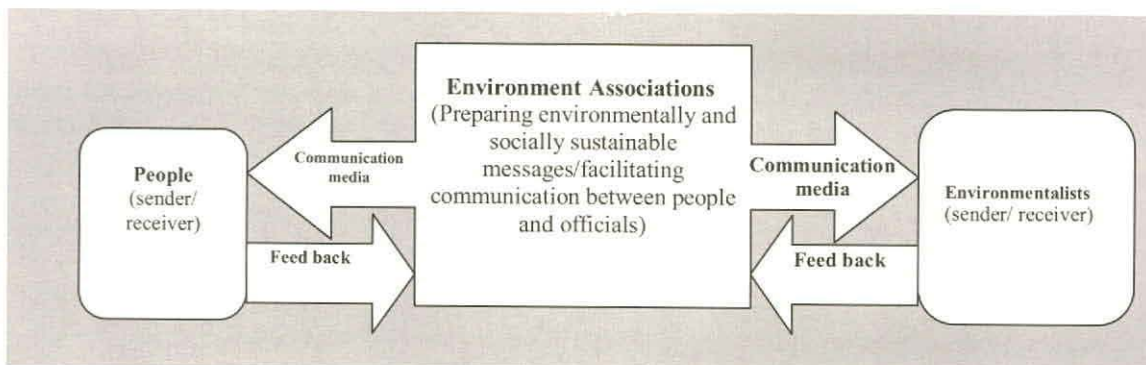


Figure 6- An alternative communication process for environmental sustainability Source: Authors

Table 2- Communication component process and their trends for environmental sustainability.

Communication components	Trends
Environmentalists (Sender/ Receiver)	Decentralization, investment on sustainable activities, establishment of NGOs, launching intermediate organizations, privatization of some public affairs, employing local part time staffs, cost sharing with people
People (Sender/ Receiver)	More attention to youth and women via getting their participation or investment on their special businesses such as handicrafts for women and recreational opportunities for youth, programs' focus on poor
Communication media	Using two-way and interactive channels for training, facilitating training programs instead of directing, using folk media to establish relationship among people, using information technologies to facilitate access to abroad information sources
Feed back	Making close relationship to costumers or clients and doing monitoring and evaluation via participatory and empowerment procedures.
Environmental sustainability	Biodiversity conservation, minimizing the consumption of un- renewable energy sources, minimizing using pastures and natural resources, decreasing soil erosion, the use of sun force, less weather- water and soil pollution via minimizing the use of chemical inputs in different agricultural activities, sustainable waste management, wastes cleaning up and recycling, environmental assessment of development projects
Environment Associations	Increasing the rate of active population, decreasing the rate of rural-urban migration, income improvement, health, nutrition, housing, employment, availability of recreational opportunities and educational equipments,
Social Sustainability	people's participation in decision making, social justice, less crime, preparing communication infra-structures, organizations' cooperation, popularizing sustainable culture, social security, social integration, preservation of traditional culture, reducing people's stress and increasing their need for achievement

Source: Authors

Based on Table 2 below recommendations are suggested to achieve environmental sustainability:

- 1) The establishment of IO in different regions of country could be useful in two dimensions: first, getting people's participation and democratization of programs; secondly, programs will be more fitted to local conditions. IO is a useful structure to reach this purpose. IO could work as a part of Rural or urban Councils that are active currently in the country, or at least use their co-thinking and co-operating.
- 2) People's living consists of different aspects that all of them are mutually related to each other. Therefore, designing, implementation and evaluation of environmental programs should be based on inter and multi disciplinary activities.
- 3) Environmental sustainability is the key element of any development program. So, any development project should be environmentally sound and the government should have serious laws to protect environment and be careful to apply them.
- 4) With regard to the importance of environmental sustainability, related courses must be entering formal and informal education.
- 5) Sustainability concerns are future-oriented therefore; sustainability planning should be long-term with proper policies, campaigns and publicities.
- 6) Nowadays, different governments use certain equipments to save and apply energy from non-limited sources such as sun. So, it is really necessary to invest on these non-limited energy sources and conduct different research projects especially, showing how to popularize these instruments for the whole society.
- 7) Hazardous products such as chemical materials should be under continual monitoring and evaluation to be environmentally safe. Furthermore, they must be obligated to give environmental certifications to start and continue their productions.

- 8) Respect to environment should become a part of the society's culture via publicity, educational campaigns and other programs. I.e. for rural people who do some hazardous activities such as using chemical pesticides and fertilizers; occupation of pastures; and scattering animal manures; and for Urban people who scatter different wastes in environment and public places.

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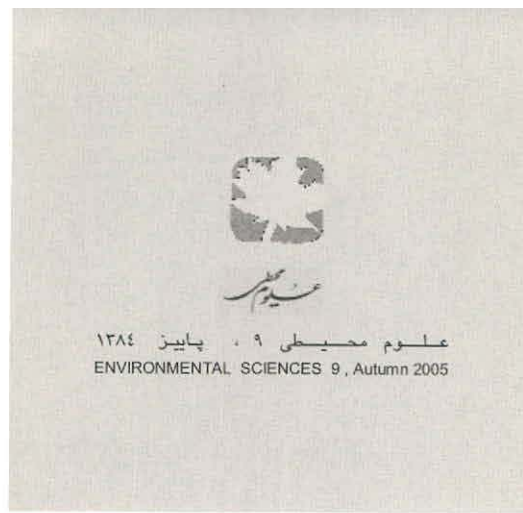
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