

ENVIRONMENTAL MIGRATION – SUMMARY ANALYSIS OF THE PROCESS

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Abstract

It is apparent that environmental degradation and resource depletion may play a contributing role in affecting population movement, often filtered through contexts of poverty, food deficiency, conflicts and inequity. This work tries to provide a summary analysis about the subject of environmental refugees as a significant group of migrants and gives essential information for understanding the topic. Definitions of the term “environmental refugee”, main reasons for fleeing the people from their habitats and the typology of environmental refugees are further topics of this article together with predicting number of environmental refugees and principal motivations for researching of the phenomenon.

The contest of following chapter is specific situation of environmental refugees in the field of international law and the role of UNHCR. Some authors declare that number of incidents, that cause people to leave their houses and fields due to environmental problems, is increasing rapidly and they perceive this as a global serious issue, especially in the light of analysis of climate change identified by the Intergovernmental Panel on Climate Change as being very likely to occur in this century.

Basic factors for predicting the environmental migration, which would identify vulnerable regions and future “hot spots” of insecurity and potential environmental migration pressure. And final part contains recommendation for implementing measures for reducing biophysical and social vulnerability to environmental changes also having significant impact on environmental migration.

Keywords: environmental migration, refugees, global issue, climate change, predicting, security.

Motto:

“Inability of responding to threats does not lead only to their tolerance, but also to denying their existence.”

Robert KAGAN

1. PREFACE

According to annual report of United Nations Populations Fund „migration is a barometer of changing social, economic and political circumstances, at the national and international levels“(UNFPA, 15). But report does not refer to environmental conditions which contribute to migration. In the television news we can see people sitting on the roofs of their houses trying to escape rising water; people beside ruins their houses after an earthquake; people who had to leave their houses and fields due to

any cyclone or tornado. They are refugees too, but not accepted by international law. But it is very interesting that millions people who have to leave their habitats due to drought or desertification we can see on television or news papers only very rarely.

The migration due to depletion of natural resources (like a water, land, etc.) or climate change causing the drought and desertification is historical human phenomenon. Some observers talk about “climate falls of civilizations” during the antiquity (Cílek, 2002, 278) but recent threatening extent would

overcome all historical projections and contexts. The debate about the possibilities of its predicting is becoming more frequent in scientific as well as humanitarian field. But the function of this debate will be more important in the future.

2. DOMAIN OF RESEARCH, METHODOLOGY AND GOALS

For complexity and global importance of the topic was necessary to weigh these following basic factors:

- Environmental factors include natural conditions and ecological factors of the regions; occurrence and frequency of natural hazards in the regions; recent and possible changes of climate in the future; possible changes of environment; environment pollution and human influences.
 - Social, economical and political factors include international law in the framework of international migration; migration processes generally; human conditions for living and principal human rights; economic and social development of the regions; population pressure and poverty.
 - Relations between environment and security include food security; conflicts for natural resources and the possible threats to future.
 - Ethical factor, in the age of globalization, especially in area of global pollution of environment and negative influence of climate change, each of us have responsibility for solution the global issues.
 - The possibilities of predicting the phenomenon of environmental migration.
- Give the phenomenon Environmental Migration into the context. The topic “Environmental Migration” is component of broad context of issues „Environment and Security“ and “Environmental History“ includes other topics like „Natural Resources and Conflicts“, „Food Security and Environment“, „Climate Change and Security“, „Environmental Degradation and Security”.
 - Try to find possible solutions of the issue. People of economically or socially poor regions should be given a chance for respectable living too, like a majority of inhabitants of developed states.
 - Try to affect the decision makers in the direction of solution the urgent issues related to environmental migration due to contests of this work and another research and analysis materials. The solutions of the complexity of environmental migration mean also contributions to preventive solutions of crisis of international relations in the beginning of Third Millennium.
 - Contribute to understand the migration processes. It is apparent that population movement will play a significant role in the future and will affect the politics and social situation in whole the world.

The range and importance of selected issue do not allow author cover in detail all possible factors. Some of them we can remark only. The main used method is analysis of selected research works, documents, information from specialized websites and the excerption the most important facts from the materials. The resulting compilation work was created by their comparison and sorting out.

The main tasks and motivations of the work are following:

3. DEFINITIONS

The term “environmental refugees” was popularized first time by Lester Brown from the Worldwatch Institute in the 1970s, but first, who most quoted attention on the subject were Essam El-Hinnawi and Jodi Jacobson (Black, 2001, 1). El-Hinnawi defines the concept of environmental refugees in 1985 in the report for United Nations Environment Program and call these refugees as a people “who have been forced to leave their traditional habitat, temporarily or permanently, because of a marked environmental disruption (natural and/or triggered by people) that jeopardized their existence and/or seriously affected the quality of their life. By ‘environmental disruption’ is meant any physical, chemical and/or biological changes in ecosystem (or the resources base) that render it temporarily or permanently, unsuitable to support human life” (LISER).

According to Norman Myers (1994, 2001b) environmental refugees are people who can no longer gain a secure livelihood in their homelands because of drought, soil erosion, desertification and other environmental problems, together with the associated problems of population pressures and profound poverty. In their desperation, these people feel they have no alternative but to seek sanctuary elsewhere, however hazardous the attempt. Not all of them have fled their countries, many being 'internally displaced'. But all have abandoned their homelands with little hope of foreseeable return.

LiSER Foundation, which is specialized on this issue, simply defines environmental refugees on their web sites like a "people getting in trouble because their livelihoods have been damaged due to natural or human causes" (LiSER).

Stuart M. Leiderman claims, that environmental refugee is "someone fleeing or who has fled from a natural disaster or chain of event that includes severe environmental deterioration; depending on combination of causes, they may be both environmental refugees, even refugees from economic disaster". (Leiderman, 2002, 5)

4. MAIN REASONS OF DISPLACEMENTS

There is a typology of the most frequently mentioned reasons for worsening environment because of the people become (or would become) refugees (compare with Lonergan, 1998; Rábelová, 2000; Blaikie, 2001).

1. Natural Disasters

- a) floods
- b) earthquakes
- c) volcanic eruptions
- d) landslides
- e) severe coastal storms (include tropical cyclones)

They are usually characterized by a rapid onset, and their devastating effect is a function of the number of vulnerable people in the region rather than the severity of the disaster. "Poor people in developing countries are the

most affected because they are the most vulnerable" (Lonergan, 1998, 50)

2. Cumulative (Slow-Onset) Changes

- a) desertification
- b) soil degradation and erosion
- c) droughts and deficiency of safe water
- d) climate changes (global warming)
- e) sea-level rise
- f) famine

Cumulative changes are, in general, natural processes existing at a slower rate which are interacted and advanced by human activities. We can find 135 million people threatened by severe desertification and 550 million people subject to chronic water shortages in developing countries (Myers, 2001b, 610). John Hardy (2003, 161) expects that climate change will probably accelerate the crisis like a "desertification from tree removal, overgrazing and other detrimental land-use practises", especially in sub-Saharan Africa region.

Lonergan (1998, 50-52) claims that "human induced soil degradation is one factor which directly affects economic sufficiency in rural areas to water availability is another factor that may affect sustainable livelihoods... Do factors like water scarcity and human-induced soil degradation in and of themselves cause population displacement? The linkage is much more indirect; in most cases, one or more of rapid population growth, economic decline, inequitable distribution of resources, lack of institutional support and political repression are also present". But in the event of validity of the theory human impacts on climate changes we are not capable to precisely recognize what is the clear natural causality (except, of course, volcanic eruptions and earthquakes) and what is natural hazards or disasters influenced by humans (such as floods, drought, hurricanes due to global warming, etc). There are combinations of human and natural factors very often.

3. Involuntarily Cause Accidents and Industrial Accidents

- a) nuclear accidents
- b) disasters of industrial (e.g. chemical) factories
- c) environmental pollution

This category includes chemical factories, transport, nuclear reactor accidents and environmental pollution (air, land, water). The two most obvious examples are the nuclear accident at Chernobyl, in Ukraine (former USSR) in 1986, and the Union Carbide accident in Bhopal, India, in 1987. „Between 1986 and 1992, there were more than 75 major chemical accidents which killed almost 4,000 persons worldwide, injured another 62,000, and displaced more than 2 million. Most of the displacements, however, were temporary. In the case of the accident at Bhopal, despite the death of 2,800 people and illnesses to 200,000 more, there was virtually no mass movement of population out of the region” (Lonergan, 1998, 52).

4. "Development" Projects

- a) construction of river dams
- b) irrigation canals
- c) mining (extracting) natural resources

It has been estimated that development projects in India forced over 20 million persons to leave their habitats in the past three decades. (Lonergan, 1998, 52).

5. Conflicts and warfare

- a) biological warfare
- b) destruction of environment
- c) wars due to natural resources

Environmental degradation is considered by many authors to cause and effect of armed conflict, the evidence of wars being fought over the environment are conflicts over land and natural resources. Lonergan (1998, 53-58) claims that “there is an increasing use of the environment as a “weapon” of war or strategic tool”. He states examples the threat by Turkey to restrict the flow of the Euphrates to Syria and Iraq in order to pressure Syria to discontinue its support of Kurdish separatists in Turkey, the purposeful discharge of oil into the Persian Gulf during the Gulf War (1990-1991) and the destruction of irrigation systems during conflicts in Somalia. Such activities have similar consequences as the slow-onset changes noted above. “But in these cases, it seems clear that the “environment” is merely a symptom of a larger conflict, and the root cause of any population movement is the conflict itself, and the reasons behind it” (Lonergan, 1998, 53-55).

In a similar way report of CIA “Global Trends 2015” (CIA, 2000, 28) estimates that “nearly one-half of the world's land surface consists of river basins shared by more than one country, and more than 30 nations receive more than one-third of their water from outside their borders”. And as soon as countries reach the highest limits of available water resources, the possibility of conflict will increase.

5. TYPOLOGY

El-Hinnawi and Jacobson created typology of environmental refugees to three sub-categories (Black. 2001, 2; see LiSER).

a) Temporary displacement people

After the disasters like floods, earthquakes, volcanic eruptions people can return to their habitats and start rehabilitation livelihoods and reconstruction their houses. These events can happen periodically. For instance alone hurricane Mitch displaced 1,2 million people in Central America, floods in Peru (in 1998) and in Mexico (in 1999) displaced in both countries 500,000 people (McGirk, 2000).

b) Permanent displacement people

Permanent displacement created by the disasters like an effect of “development projects” (e.g. large dams, industrial events, mining etc). Potentially the refugees affected by rise of sea-level due to climate changes will belong to this group in the future. The World Commission on Dams (WCD) published in 2000 report in which evaluated impacts of building the large dams in the second part of 20th century. The displacement is reported from 68 of the 123 dams (56 per cent), mainly in Asia, Africa and Latin America large dams like one of the form of displacement forced to leave from 40 – 80 million people from their livelihoods and homes, for example 10,2 million in China between 1950 and 1990 (34 per cent all development-related displacement including that due to urban constructions) according to official statistics. “But independent sources estimate that the actual number of dam-displaced people in China is much higher than the official figure” (WCD, 2000, 102-104). More than 1.2 million people and according to some estimates, up to 1.9 million people will have to be resettled for the controversial project of the Three Gorges Dam

in China's Yangtze Valley. Reservoir filling will continue to 2008." (Friends of the Earth, 2003; compare with Dai Qing, 1998) Large dams in India forced to leave 16-38 million people. But these numbers "do not include the millions displaced due to other aspects of the projects such as canals, powerhouses, project infrastructure ..." (WCD, 2000, 104). Unfortunately, "resettlement programmes have predominantly focused on the process of physical relocation rather than the economic and social development of the displaced and other negatively affected people. The result has been the impoverishment of a majority of resettlers ..." (WCD, 2000, 103).

c) Temporary or permanent displacement people

Sometimes – for instance after a period of drought – the displaced people indeed can go back to their original habits, but with uncertain future. For instance on September 2002 New Scientist on their web side (Pearce, 2002) published report written by team of geographers from Britain, Sweden and Denmark who had re-examined archive satellite images taken across the Sahel and found out that "vegetation seems to have increased significantly" in the past 15 years, with major regrowth across swathe of land stretching from southern Mauritania, northern Burkina, north-western Niger, central Chad, much of Sudan and parts of Eritrea, 6000 kilometres long. "Survey among farmers showed a 70 per cent increase in yields of local cereals (sorghum, millet) in one province in recent years", confirmed Chris Reij from the Free University, Amsterdam (Pearce, 2002). His colleague Kjeld Rasmussen from the University of Copenhagen "believes the main reason is increased rainfall since the great droughts of early 1970s and 1980s. But farmers have also been adopting better methods of keeping soil and water on their land." (Pearce, 2002)

6. THE ROLE OF INTERNATIONAL LAW

The international refugee legislation likewise the main organization responsible for refugees on the world level – United Nations Commissioner for Refugees (UNHCR) – both were established more than fifty years ago and

originally were meant for the huge number of displacement people after World War II. The Treaty of Geneva from 1951 calls refugees "as persons forced to flee across an international border because of a well-founded fear of persecution based on race, religion, nationality, political opinion or membership of particular social group". (UNHCR, 1951; UNHCR, 2002) "The main conditions are that a person finds himself in a foreign country and does not have legal protection in the country of his nationality... people are on the move for other reasons than just war or violence" (LiSER). Many critics argue that times have changed during the last few decades. There are, at least, two reasons for changing – categories persons called "internally displaced peoples" and "environmental refugees (migrants)" because of that at this moment the international law does not recognize them as refugees and they can not count with any material or juridical support of institutions like the UNHCR or government agencies (compare with Black, 2001, 1; LiSER; UNHCR, 2002). There is one of the reasons why we have not enough information about exact numbers of environmental refugees.

And there is another (ethical) question "is it right that while some states are far more responsible for creating problems like climate change, all states should bear equal responsibility for dealing with its displaced people?" (UNHCR, 2002). It could be very important law problem in future because of preparation legal actions by small Pacific island states against Australia and USA (which deprecate to ratify Kyoto Protocol), the largest producers of greenhouse gases in this region. These islands could become uninhabitable due to sea-level rise and its residents could become new environmental refugees. In this case does not exist any "adaptive strategy", the islands will disappear under water.

7. ENVIRONMENTAL OR ECONOMIC MIGRATION?

Is the issue of environmental refugees (migrants) new or old phenomenon? What does it indicate for present time?

Richard Black (2001, 6) argue (on the base of study by Glazovsky a Shestakov) that migration away from desertification areas "is

not new, including as 'desertification-induced migration' such a movement as the migration of Mongolia tribe northwards in the second century B.C. due to drought..."

Richard Black (2001, 1) permits the environmental degradation and catastrophe may be important factors in the decision to migrate, but the "conceptualization as a primary cause of forced displacement is unhelpful and unsound intellectually, and unnecessary in practical terms". Similarly Homer-Dixon (1993) believes the term "environmental refugees" is misleading because "it implies that environmental scarcity will be the direct and sole cause of refugee flows. Usually it will be only one of large number of interacting physical and social factors that may together force people from their homelands. The term also does not distinguish between people who are fleeing due to genuine disaster or acute hardship and those who are migrants for a variety of less urgent reasons." (Homer-Dixon, 1993, 40-41) He suggest to use the term environmental refugees "only when there is a sudden and large environmental change" and presents example of "population displacement rising from environmental scarcity. Over the last three decades ... land scarcity has been a key factor causing the large-scale movement of people from Bangladesh to the Indian state Assam" (Homer-Dixon, 1993, 41-42).

Norman Myers is aware of difficulties in making difference between refugees driven by environmental factors and those forced by economic problems but "people who migrate because they suffer outright poverty are frequently driven by root factors of environmental degradation". (Myers, 1994). At least environment conditions and natural resources are one of the most important direct factors determined economic developments or impoverished.

Richard Black (Black, 2001) questioned desertification as one from the most frequently mentioned reasons of displacement, when he talks about "myths" of desertification. "Even if there is no secular trend of declining vegetation cover and land productivity in Sahel ... it is possible that stress migration might result from a temporary decline in the productivity of agricultural and grazing land

during drought periods. Yet, for such migrants to be termed "environmental refugees", it seems reasonable that environmental decline should represent the main (if not only) reason for their flight" (Black, 2001, 4). And also the study by Sally Findley (Black, 2001, 7) about "emigration from the Senegal River Valley in Mali shows that during the drought of the mid-1980s, migration actually declined rather than increased". According Black (2001, 6) the situation appears similar in other semi-arid regions of the world allegedly prone to desertification and related migration.

Myers (1994) claims that people have migrated in large numbers and proportions in the past mainly due to deficits of natural resources (e.g. land, famines). "But the present area is altogether different and environmental problems ahead could swiftly match all those of previous centuries combined. Countries such as Philipines, Ivory Coast and Mexico can lose bulk of their forests within half a human lifetime. Countries such as Ethiopia, Nepal and El Salvador can lose much if not most of their farmland topsoil within just a few decades. Countries such as Jordan, Egypt and Pakistan can find themselves suddenly suffering acute deficits of water ... Whole regions can find their protective ozone layer is critically depleted within a single generation. The entire Earth seems set to experience the rigours of global warming in what is, comparatively speaking, super-short order. Any of these environmental debacles can generate refugees in exceptionally large numbers." (Myers, 1994)

The environmental migration is not new phenomenom, but recent extend of population pressure, environmental degradation in mentioned regions and the threats of climate change (e.g. sea-level rise), together with possibilities to acquire the modern automatic guns (like a "kalasnikov") add new dimensions to the phenomenom.

Lester Brown (2004) adds that among the "new refugees" are people being forced to move because of aquifer depletion and wells running dry. Thus far the evacuations have been of villages, but eventually whole cities might have to be relocated, such as Sana'a, the capital of Yemen, where the water table is falling by 6 meters a year according the experts from World Bank; or Quetta, the capital of

Pakistan Baluchistan province, which was originally designed for 50,000 people and now has 1 million inhabitants and may have enough water for the rest of this decade like a Sana'a.

8. ENVIRONMENTAL MIGRATION AS A GLOBAL ISSUE

Some analysis of climate change identified by the Intergovernmental Panel on Climate Change (IPCC, established by World Meteorological Organization and the United Nations Environment Program in 1988) as being likely or very likely to occur in this century include (McLeman, Smit, 2004, 5):

- Increased maximum temperatures and more hot days over most land areas;
- higher minimum temperatures and fewer cold and frost days over most land areas;
- increased risk of drought over many land areas;
- more intensive rainfall and snowfall events over most land areas;
- increases in peak wind intensities of tropical cyclones over some areas, accompanied by increases in peak rainfall and precipitation accompanying such storms;
- sea levels will rise between 9 and 88 cm.

Many of these represent risks which can give rise to human migration. Some authors declare that number of incidents, that cause people to leave their houses from environmental problems, is increasing rapidly and they perceive this as a global serious issue, mainly for the future. Norman Myers assumes that "environmental refugees could become one of the foremost human crises of our times" (Myers, 1994). He presented first reports (Myers, 1993, 1994) about numbers of environmental refugees ten years ago, he estimated there was more than 25 million environmental refugees (10 million recognized, 15 million unrecognized) and it is greater than 18 million officially recognized refugees (political, religious, ethnic, etc). "We can fairly assume, moreover, that the total is likely to swell rapidly as burgeoning numbers of impoverished people press ever harder on over-loaded environments." (Myers, 1994)

His (1993, 1994) conservative estimate for 2050 is between 150 million and 200 million environmental refugees equates 1,5 per cent (respective 2 percent) of 2050's predicted

global human population (10 billion people) due to sea-level rise and agricultural distribution caused by global warming and climate changes mainly. He counts with 50 million globally displaced people due to climate change-induced famine. "Detailed analysis of the impact of climate change on agriculture suggests that by the year 2060 global warming may decrease cereal production in developing countries by 9-11 per cent" (Myers, 1993).

Climate change will alter (or alter right now) regional agricultural and industrial potential and could trigger large-scale migrations. "The lifestyle of most human populations is adapted to a very narrow range of climatic conditions. Human settlements generally concentrate in areas of high industrial or agricultural potential, that is, areas with hospitable climates, near coastlines, in river and lake basins, or close to major transportations routes." (Hardy, 2003, 160-161). According to most scenarios, climate change will place added demands on urban infrastructures. "Climate change could accelerate urbanization, as people migrate away from low-lying coastal to interior areas or from drought-stricken farms to cities." (Hardy, 2003, 161).

Egypt would lose 12-15 percent of its arable land and "given Egypt's predicted population for 2050 it is realistic anticipate that sea-level rise may displace more than 14 million people", as well as region of Shanghai, where government of China calculates that "30 million people may be displaced due to global warming impacts". Sea-level rise coupled with increase of inland floods (from melting Himalayan glaciers) would affect estimating 142 million inhabitants of India's coast living of flood zones and people from Bangladesh. His "conservative" approximation is 30 million environmental refugees for India and 15 million for Bangladesh. Brown (2004) presents that "only" one meter rise in sea-level would inundate half of Bangladesh's riceland and forcing the relocation of easily 40 million people. "Other delta areas at risk include Indonesia, Thailand, Pakistan, Mozambique, Gambia, Senegal and Suriname" (together 10 million estimated environmental refugees) as well as number of islands, such as Maldives, Kiribati, Tuvalu, the Marshalls and some small islands in the Caribbean (1 million). He also

warns of safe water problems caused by pollution of sea salt water which would encourage mass migration (Myers, 1993, compare with Novák, 2004). And Brown is asked, how many countries would accept even one million of Bangladesh's 40 million? (Brown, 2004)

Lester R. Brown presents "some 400 to 600 Mexicans leave rural areas every day, abandoning plots of land too small or too eroded to make a living. They either head for Mexican cities or try to cross illegally into the United States. Many perish in the punishing heat of the Arizona desert. Another flow of environmental refugees comes from Haiti, a widely recognized ecological disaster" (Brown, 2004). And he provides that in China, where the Gobi Desert is growing by 10,400 square kilometers a year the refugee stream is swelling. "Asian Development Bank preliminary assessment of desertification in Gansu province has identified 4,000 villages that face abandonment". (Brown, 2004).

Environmental degradation, nuclear disaster, building of irrigations canals and about 700,000 environmental refugees, there are the reasons of policy of soviet leaders and one of the clearest examples of environmental migration (UNHCR, 1996; UNHCR 1997, Box 1.2). According the report of UNHCR (1997, Box 1.2) "much of the Central Asia is affected by problems such as soil degradation and desertification by decades of agricultural exploitation, industrial pollution and overgrazing. During the Soviet years, irrigations schemes were introduced throughout the region (Aral Sea area), so that cotton could be cultivated on an intensive and continuous basis. Poorly designed and badly managed these irrigations schemes (mainly on rivers Amu Darya and Syr Darya) led to the large-scale wastage of scares water resources and the degradation of the land as a result of salinization". Using massive amounts of chemicals makes contamination of water, land and food. Around 270,000 people in the region were displaced for such reason (UNHCR, 1997). More than 45,000 people have moved from the Semipalatinsk in Kazakstan to safer areas in the country since independence. Semipalatinsk was hosted one of the Soviet largest nuclear missile testing-sites (UNHCR, 1996).

The Chernobyl nuclear power plant explosion took place in 1986 and there are as many as 9 million people living in Ukraine, Belarus and the Russian Federation may have been directly or indirectly affected. "At least 375,000 people (150,000 million in both Ukraine and Belarus; 75,000 in Russian Federation) had to leave their homes in the immediate aftermath of the accident." (UNHCR, 1996)

Miroslav Vaněk (1996, 48) presents in his study, with typical name "Nedalo se tady dýchat" (The Breathing was Impossible Here), that the North Bohemia region have left 50 000 people due to environmental pollution in 1960s. Communist functionaries were trying to prevent another flights by guarding of information about condition of pollution air, increasing of wages and social benefits and also because of decision by government of Czech Socialist Republic in 1984 there was prohibited employing of medics from North Bohemia outside this region (Vaněk, 1996, 63). Author characterized this situation like a "modern thralldom". At the same time because of escalated mining of coals was induced destroying 116 villages in the previously described region (Vaněk, 1996, 60) – known as "Black Triangle", together with parts from Poland and former German Democratic Republic.

Myers (2001b, 611) modified in May 2001 his own forecasts about total numbers of people at risk of sea-level rise (not directly environmental refugees), "in Bangladesh could be 26million, in Egypt 12 million, in China 73 million, in India 20 million and elsewhere, including small island states, 31 million, making of total of 162 million. At the same time, at least 50 million people could be at severe risk through increased droughts and other climate dislocations".

9. BASIC FACTORS FOR PREDICTING ENVIRONMENTAL MIGRATION

It is apparent that environmental degradation and resource depletion may play a contributing role in affecting population movement, often filtered through contexts of poverty, food deficiency, conflicts and inequity. We can agree with Rábelová (2000, 7) that prognosis of scope for environmental migration are based

on estimates more than significant evidences, in spite of this is essential do not underrate the impacts of environmental changes and depletion of natural resources on movement of population from the view of international security.

Some authors (Myers, Döös, Brown, etc.) expect dramatic increase number of environmental refugees during the next decades. In the future “the refugees may be forced to move considerably farther away from their country of origin” (Döös, 1997, 41). For this reason seems to be important to deal with predicting environmental migration and identifying vulnerable regions and future “hot spots” of insecurity and potential environmental migration/refugee pressure. In advance we should observe that we have very limited opportunity for reaching the definite and comprehensive conclusions due to complexity of the problem. We have to take into consideration different environmental and socio-economic-political determine factors which come in to play and interact with each other (compare with Lonergan 1998, XI; Döös, 1997, 41).

1. Environmental factors

- frequency and intensity of natural hazards (e.g. floods, earthquakes, volcanic eruptions, tropical cyclones)
- intensity and result of “sustainable” climate change (e.g. floods, deficiency of precipitation and droughts, tropical storms, crop reduction, food deficiency and famines, sea-level rise)
- degree of environmental degradation and pollution, resources depletion (e.g. loss of water resources, air pollution, soil degradation and erosion, desertification, deforestation, area of overfishing or natural resources depletion)

2. Social, economic and political factors

- intensity and result of population pressure (e.g. overpopulation, food deficiency and famines, environmental degradation)
- significance of social unrest and political instability (e.g. religious intolerance, unemployment, political subversions)
- intensity and duration of economic crisis (e.g. unemployment, external debts)

- number, intensity and duration of conflicts (e.g. food deficiency and famines, ethnical conflicts, civil wars)
- poverty

The process of predicting environmental migration can start after detailed analyzing and evaluating these factors (in this article presented very simply and shortly).

10. CONCLUSION

In view of complexity and interdependencies of the various factors (or driving forces) causing migrations, some authors (Döös, Homer-Dixon, Black, etc.) do not consider the term environmental migration usable or “entirely appropriate” (compare with Döös, 2004, 41). But none of them questioned important role of environmental factors in the process of migration. Thus, when environmental factors dominate, or possibly play key or important role in the process of migration, we can talk about the environmental migration.

For Lester Brown (2004) “the rising flow of environmental refugees is indicator that our modern civilization is out of sync with the earth’s natural support systems”. It is apparent that environmental driving forces (such as natural hazards, possible “sustainable” climate change, environmental degradation, pollution and resource depletion) contribute to human displacement, often filtered through context of social, economic and political forces (such as population grow, famine, poverty, conflicts, unemployment).

From the view of international security we need to develop some warning system for predicting environmental migration watching and evaluating possible environmental factors and for identifying vulnerable regions and future “hot spots” of insecurity and potential migration/refugee pressure (compare with Lonergan 1998, XI). This system would give effective assistance in mitigation responses. Sure, the most important is to develop and implement measures for reducing possible biophysical and social vulnerability to environmental changes having also significant impact on environmental migration. The solutions of the complexity of environmental

migration mean also contributions to preventive solutions of crisis of international relations in the beginning of Third Millenium. Lonergan (1998, X-XI) and his team recommend implementing follows measures for reducing biophysical and social vulnerability to environmental changes having also significant impact on environmental migration:

1. Increase assistance in the field of family planning in developing countries where the population growth is a threat to the environment and to the economic livelihood of many people.
2. There must be greater focus on agricultural activities in developing countries. This should focus on reducing erosion and deforestation, and increasing the sustainability of small farms in marginal areas.
3. Greater effort should be made to improve education and awareness with respect to the environment. This includes care for the environment and sustainable resource use.
4. Sufficiency of freshwater is crucial. It is also imperative that treated water be recycled to agricultural uses. Inefficient use of water, water loss must be preventing.
5. Encourage of greater capacity building in the administration of environmental programs.

Norman Myers suggests to implement following preventing policies, with the aim of reducing the need to migrate by ensuring an acceptable livelihood in established homelands (Myers, 2001b, 611-612):

1. Expand our approach to refugees in general in order to include environmental refugees in particular. We cannot continue to ignore environmental refugees simply because there is no institutionalized mode of dealing with them.
2. Wide and deep our understanding of environmental migration by establishing the root causes of the problem – not only environmental causes, but also associated problems.
3. Advance except in a overall context of the concept of sustainable development, notably to reliable access to food, water, energy, health and other basic human needs.

4. Achieve of better targeting of foreign development aid and co-operation (more closely directed).

Finally we may not forget that also the people of economically or socially poor regions should be given a chance for respectable living too, like a majority of inhabitants of developed states. It means we have to try deal with the environmental problems like a climate change or dezertification, wchich could be good start for development of poor countries and clear environment for all.

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