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Environmental Change and Migration: Governmental Compensation Policies to Natural Disasters Victims and Urbanization Process:

A Case Study of Wildfires in Russian Federation in 2010

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Editorial

The conference "Environmental Change and Migration: From Vulnerabilities to Capabilities" was the first of a new conference series on "Environmental Degradation, Conflict and Forced Migration". It was organised by the European Science Foundation, the Bielefeld University and its Center for Interdisciplinary Research. The Center on Migration, Citizenship and Development (COMCAD), the Universities' unit responsible for scientific content and quality of the conference, has launched a COMCAD Working Paper Series on "Environmental Degradation and Migration". The new series intends to give conference participants the opportunity to share their research with an even broader audience.

The symposium focused on how environmental change impacts the nexus between vulnerabilities on the one hand and capabilities on the other hand, and how this relationship affects mobility patterns. Although the conference organizers chose to include all kinds of environmental change and types of migration, climate change figured prominently among the submissions to the conference. Therefore, the conference aimed to bring together the perspectives from climate change, vulnerability, and migration studies, and to draw conclusions about the political implications of the knowledge scientists currently have available. Toward that goal, the conference was structured along three pillars. The first concentrated on climate change and the vulnerability of certain regions and groups. It covered case studies as well as different approaches for making climate change projections and assessing the likelihood of vulnerability. The second pillar focused on empirical research on environmentally induced migration from a vulnerabilities perspective, but acknowledged the occasionally strong elements of capability within it. In this way, the aim was to learn about approaches and options to support existing capabilities. The third pillar was concerned with the opportunities and pitfalls of policy options in dealing with the future challenge of climate induced displacement, and with the analysis of dominant public discourses within the field.

The researchers invited represented a wide range of disciplines, including sociology, social anthropology, migration, conflict, gender and development studies, geography, political science, international law, and climate and environmental science. The conference was also well balanced in terms of geographic origin, gender, and academic status of the participants. The conference programme and full report can be found at www.esf.org/conferences/10328.

Bielefeld, February 2011 Jeanette Schade and Thomas Faist

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Abstract

The paper discusses migration related to natural disasters analyzing a summer 2010 wildfire crisis in Russia. The paper starts with a review of a contemporary discussion on global environmental change, urbanization, climate change, migration, environmental refugees, and migration issues. The factual core of the paper is presented by a description of wildfires which occurred in the period of 22 July – 30 August 2010 in central Russia and covered an area of about 6 million hectares. Wildfires took place in 19 administrative regions affecting 199 human settlements and made 3591 families (or 7237 persons) homeless, 1799 persons needed medical attention, and 62 persons died. Russian government provided a variety of compensation measures to the victims, including monetary contribution and building a new house options. Analysis of statistics on the victims' choice on which alternative governmental compensation packages to take, as well as statistics on actual new housing construction, have shown that about 30 to 50% of victims has moved to a bigger settlement. The paper concludes that natural disasters facilitate urbanization process, due to associated "push" and "pull" migration factors; some of these factors are represented by governmental policy to create bigger settlements to provide cost-effective fire protection services. The author argues that these policies can be viewed through a concept of ecosystem and infrastructure services, and extrapolated on land use analysis in other disaster prone regions.

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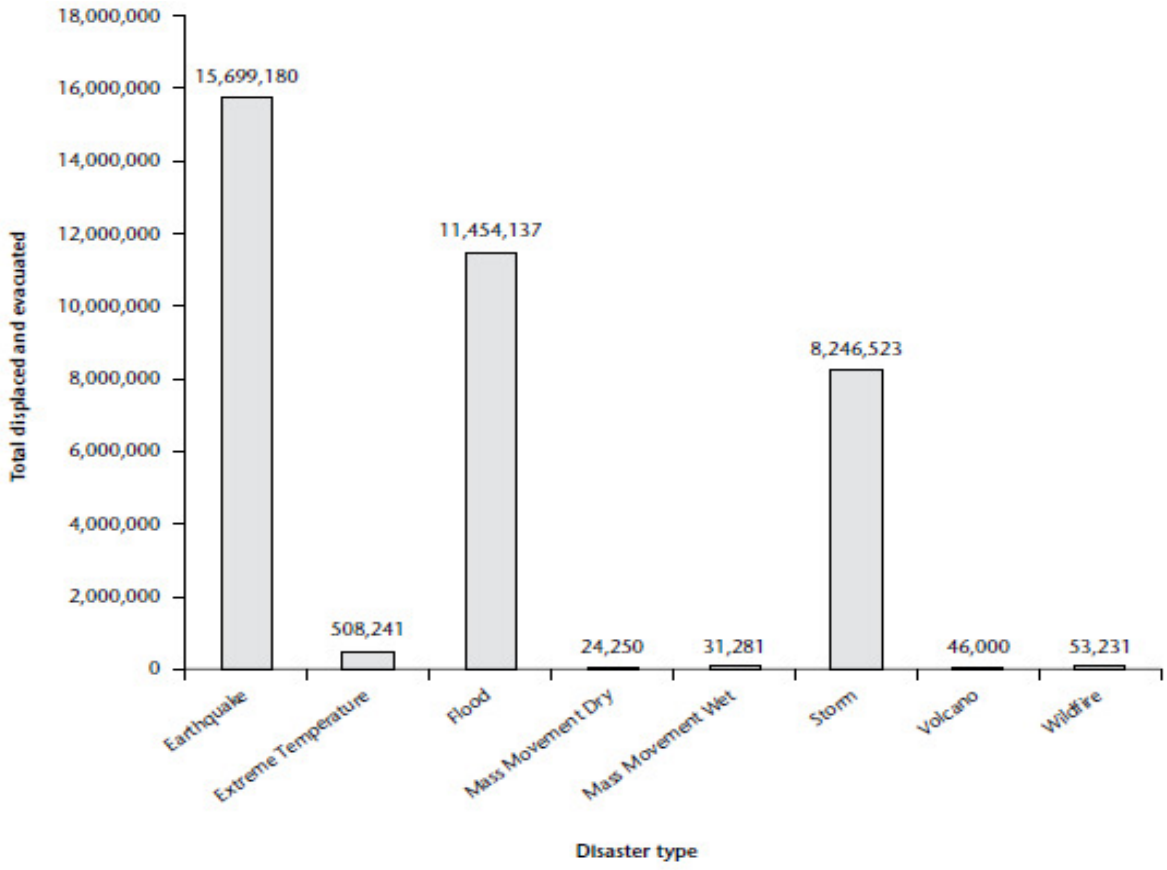
1. Introduction – environmental change and migration

Environmental migrants are persons or groups of persons who, for reasons of sudden or progressive change in the environment that adversely affects their lives or living conditions, are obliged to leave their habitual homes, or choose to do so, either temporarily or permanently, and who move either within their country or abroad (International Organization for Migration, 2007).

Probably the best available data on environmental migration are the figures on the number of persons displaced by natural disasters. In 2008, for example, 20 million people were displaced as a result of sudden onset climate-related weather events, compared to 4.6 million internally displaced by conflict and violence (United Nations Office for the Coordination of Humanitarian Affairs and the Internal Displacement Monitoring Centre, 2009). Figure 1 presents a breakdown of total number of displaced and evacuated persons by disaster type in 2008.

Figure 1. Total displaced and evacuated in 2008 by disaster type. Source: United Nations Office for the Coordination of Humanitarian Affairs and the Internal Displacement Monitoring Centre, 2009.



There is, however, no global database on migratory movements related to natural disasters (International Organization for Migration, 2010). Such database on migration resulting from the effects of environmental change would be one step in establishing a better evidence base for new policies (International Organization for Migration, 2010).

Future forecasts vary from 25 million to 1 billion environmental migrants by 2050, moving either within their countries or across borders, on a permanent or temporary basis, with 200 million being the most widely cited estimate (International Organization for Migration, 2010). This figure equals the current estimate of international migrants worldwide.

2. Research context and aims

This research aims to examine an unprecedented wildfire crisis which occurred in Russian Federation in summer 2010. Wildfires were ravaging across central Russia as extremely hot for the region weather broke several temperature records. This wildfire crisis is important to highlight in the context of climate change discussion, since wildfires can be caused by as well as contributing to global warming (see section "Wildfires in the context of global change").

While natural disasters occurrence is predicted to increase, as well as a number of environmental refugees, it is important to study where these refugees are migrating. The central research question for this case study is if wildfires facilitate urbanization? To answer this question we will review statistics relevant to wildfire crisis, as well as analyze response policies by the Russian government.

Urbanization and climate are the two major factors of global change. A research hypothesis is that these two factors are closely linked in the case of wildfires. Changing climate would lead to more natural disasters and facilitate urbanization, because many disasters' victims (potential victims as well) would prefer to migrate to urban areas.

United Nations Department of Economic and Social Affairs Population Division, 2007 estimates that in the next twenty-five years almost two billion more people will move into cities. This figure might need revision in light of natural disasters induced migration to urban areas.

3. Facts about summer 2010 wildfires in Russia

Wildfire crisis in central areas of Russian Federation in summer 2010 constituted a dramatic series of events which attracted nationwide attention. Wildfires occur in Russia annually, and in spite of vast area affected usually they are perceived as normal phenomena. Major wild-

fires occur in scarcely populated areas of Siberia, where vast areas of boreal forests are allowed to burn down because of technical difficulties and costs of organizing firefighting.

However in 2010 wildfires ravage across 19 regions of Russian Federation, and affected 199 human settlements. The wildfires occurred in the regions which are traditionally considered as low wildfire risk ones. The reason for this was a quite hot and unusually dry weather conditions. According to the Russian Federal Service for Hydrometeorology and Environmental Monitoring, in 2010 Russia has seen the longest unprecedented heat wave for at least one thousand years. The city of Moscow reached the highest ever recorded temperature of 38.2 degrees Celsius on July 29, and there were 19 absolute day temperature maximums recorded during summer 2010. Figures 2 – 7 illustrate wildfire crisis.

Figure 2. Carbon monoxide concentrations in the atmosphere between 2 and 8 km above Russia as recorded from 1 to 8 August 2010. Ground concentrations of this dangerous gas are reported to be much higher, causing people to report headaches, dizziness, and other more serious conditions. Source: NASA MOPITT.

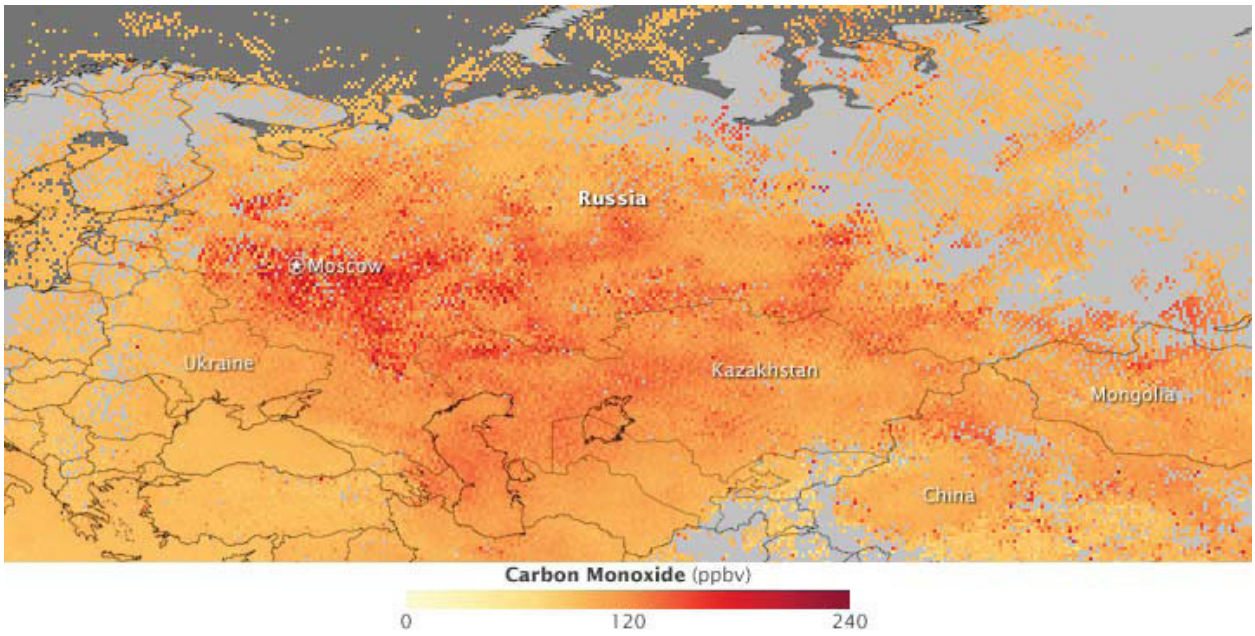


Figure 3. A satellite image of Moscow region during wildfire crisis in July 2010. The small red boxes indicate fires, blurry white is smoke. The image covers 900 km from side to side. The city of Moscow is located near the left edge, in the lower third. Source: NASA MOPITT.

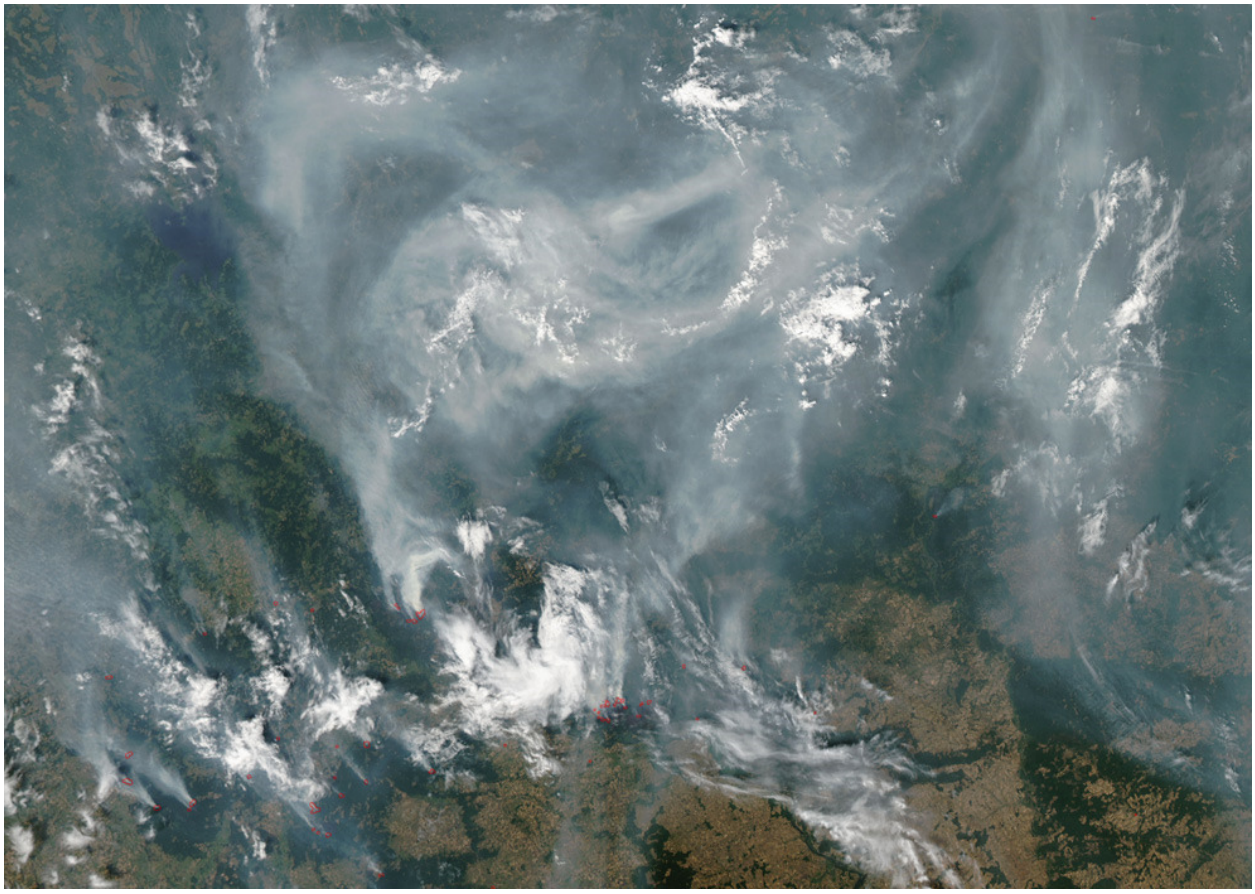


Figure 4. A satellite image and a map of the corresponding area showing forest fires in Moscow region on August 10, 2010. Source: Ministry of Civil Defense, Emergencies and Disaster Relief of Russian Federation.

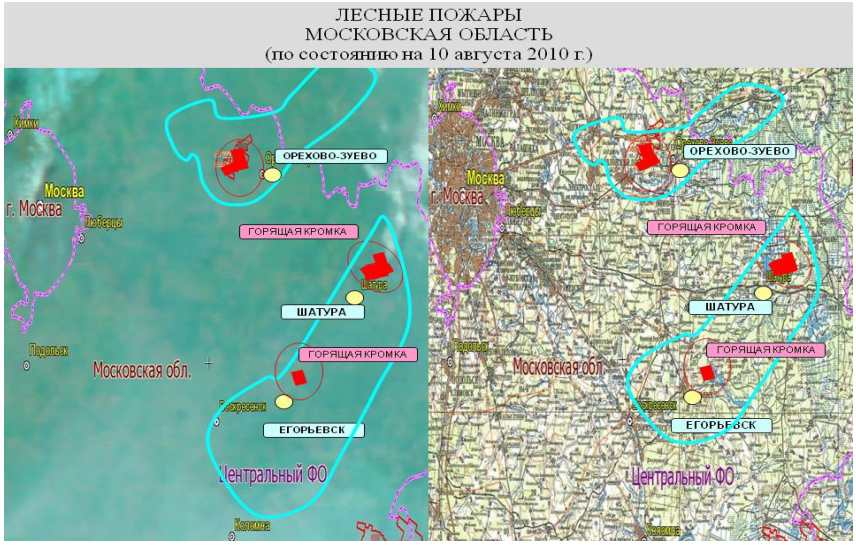


Figure 5. A map of wildfires in Nizegorodsky region on August 10, 2010. Red circles represent active wildfires, blue circles – eliminated fires. Red lines represent fire monitoring route flown by helicopter on that date. Source: Ministry of Civil Defense, Emergencies and Disaster Relief of Russian Federation.

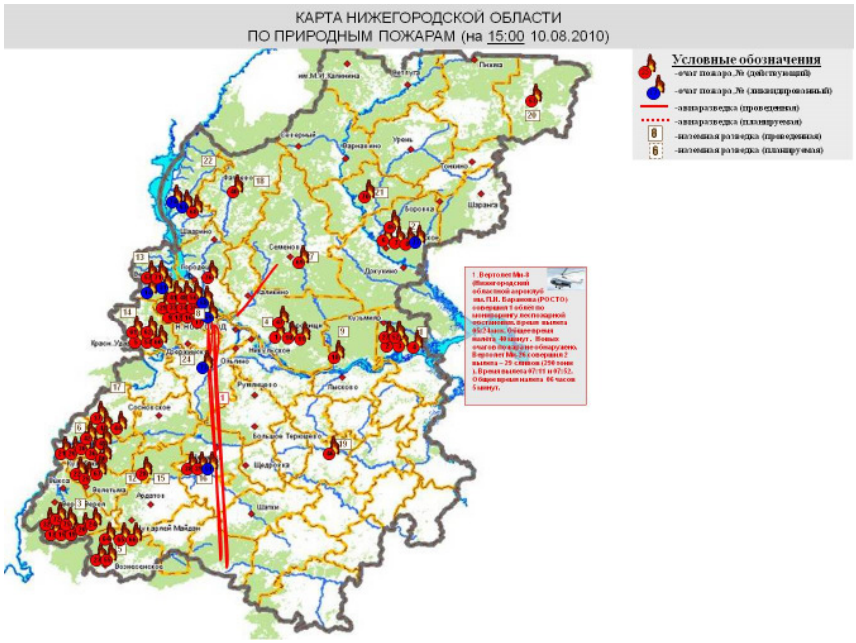


Figure 6. Wildfire near a suburb of the city of Voronezh photographed on August 1, 2010. Flames travel along a forest floor as the parched grass and trees burn. Source: AP Photo/Mikhail Metzel.

Figure 7. An impact of wildfire on a small town of Mokhovoe photographed on July 30, 2010. Source: AP Photo/Dmitry Chistoprudov.

The Russian authorities were not prepared enough to face the wildfires on this unprecedented scale. Reports by the Russian Government and some NGOs (WWF, Greanpeace, 2010) highlight poor forest management with lack of environmental harvesting and fire protection openings. These forest fire protection measures are of course particularly important on the borders of human settlements.

Media (e.g. http://www.vesti.ru/) reported that many small towns and villages were affected, with fire spreading quickly and in difficultly predicted directions. Remoteness of the settlements and bad roads often led to the houses were burned down before firefighters were able to arrive.

Considering environmental migration is also important to note that forests represent important livelihoods for residents of a small settlements, and loss of forest in an immediate surrounding is a serious factor for “push” migration. Forests main services/functions that are valued by residents in central Russia are amenity, mushrooms, berries, hunting, and firewood.

According to the satellite-derived analysis provided by the V.N. Sukachev Institute of Forest of Siberian Branch of the Russian Academy of Sciences and Ministry of Civil Defense, Emergencies and Disaster Relief, the total area burned in Russian Federation during forest fire crisis in the period of 22 July – 30 August 2010 is about 6 million ha. For comparison this area is about 2 sizes of Belgium.

The most affected regions of Russia are Niznii Novgorod, Altay, Rjazan, Voronez, Belgorod, Tambov, Tula, Vladimir, Lipezk (regional capitals names are listed here).

According to the official governmental statistics, wildfires made 3591 families (or 7237 persons) homeless, 1799 persons needed medical attention, and 62 persons died.

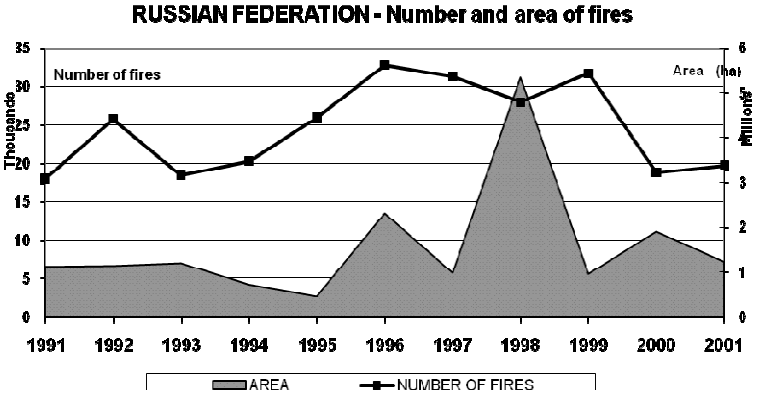
Russia is experiencing continuous urbanization, urban population in Russia accounts for 72.8% (World Bank, 2009). A phenomenon of "dying villages" was highlighted by wildfires statistics: 47% of the victims were elderly.

4. Wildfires in the context of global change

Wildfires are a natural phenomenon, however in many cases they are thought to be started by human neglect or on purpose. Wildfires of a big scale emit a lot of carbon, and affect Earth's climate. Direct and indirect fire-generated carbon emissions from boreal forests worldwide may exceed 20% of the estimated global emissions from biomass burning (Conarda et al, 1997). In 2001 carbon emissions from Russian forest fires constituted around 11–17% of that year's Russian industrial emissions (Zhanga, 2003). Global climate change in its turn might create favorable conditions for wildfires (Intergovernmental Panel on Climate Change, 2007).

There were some attempts to quantify wildfires occurring on the Russian territory. Sukhinin et al, 2004 found that the official burned-area estimates are conservative because the official statistics does not register smaller fires, and, in many cases, fire areas are slightly underestimated. Sukhinin et al, 2004 estimated that an average of 7.7 million ha per year of fire occurred in Eastern Russia between 1996 and 2002 and that fire was widely dispersed in different regions. Conarda et al, 1997 claims that 12 million ha per year may be a reasonable conservative estimate of burned area in Russia. The satellite-based burned-area estimates area were two to five times greater than those contained in official government burned-area statistics. In 2002 burned area was estimated as high as 12.1 million ha (Sukhinin et al, 2004). Figure 8 is based on an official fire statistics provided by United Nations Economic Commission for Europe, and depicts fire occurrence in 1991 – 2001.

Figure 8. Forest Fire Statistics in Russia 1999-2001. Source: United Nations Economic Commission for Europe, Forestry Statistics. http://w3.unece.org/pxweb.



There is a distinct zonal distribution of fires in Russia; 65% of the area burned occurred in the taiga zone, which includes southern, middle, and northern taiga subzones, 20% in the steppe and forest steppe zones, 12% in the mixed forest zone, and 3% in the tundra and forest-tundra zones. Lands classified as forest experienced 55% of all burned area, while crops and pastures, swamps and bogs, and grass and shrubs land cover categories experienced 13% to 15% each (Sukhinin et al, 2004).

5. Analysis of the compensation measures to victims

A response of the Russian government to the wildfires 2010 crisis includes: immediate measures for firefighting (commissioning additional financial and equipment resources, including military), immediate help to victims (medical, financial, temporary housing), long term help to victims (compensation measures), adjustment of relevant policies (forest management, land use). Table 1 lists Russian governmental bodies primarily concerned with response to wildfires crisis giving details on the exact tasks which were assigned to them. The respective ministries posted information about their activities in response to wildfires, usually in a special section or news section (archive) of their website (the website links are given in the table 1). The office of Prime Minister organized an online round a clock translation of video from the houses for victims construction sites via webcams. A webcam translation during a period of several months represents an unprecedented publicity campaign, which reflects an importance which the government gave to the wildfires crisis response.

Table 1. Russian Federation Governmental bodies primarily concerned with response to wildfires crisis.

Governmental body	*Website*	*Functions*
Office of Prime Minister	http://premier.gov.ru/	Overall monitoring of the implementation of the compensation measures; on-line translation of new houses construction through web cameras.
Ministry of Economic Development	http://www.economy.gov.ru/	Fine-tuning economic development plans in the affected regions
Ministry of Natural Resources and Environmental Protection	http://www.mnr.gov.ru/	Review of measures for wildfires prevention, fine-turning forest management practices
Ministry of Healthcare and Social Development	http://www.minzdravsoc.ru/	Immediate help to the disaster victims
Ministry of Civil Defense, Emergencies and Disaster Relief	http://www.mchs.gov.ru/	Immediate help to the disaster victims, firefighting
Ministry of Defence	http://www.mil.ru/	Firefighting
Ministry of Regional Development	http://www.minregion.ru/	Head agency for implementation of governmental compensations measures

As this study focuses on migration and urbanization analysis resulting from wildfires, we will concentrate on the governmental response measures which go beyond an immediate action to tackle fires and help the victims, these are essentially compensation policies.

Russian government lists the following monetary measures to help the wildfires victims. Figures are given in thousands of Russian rubles (1000 RUB approximates 30 USD or 25 euro):

- Immediate payment – 10
- Loss of movable possessions (from regional budgets) – 100
- Loss of unmovable possessions (from regional budgets) – 100
- New housing construction – 2000
- Infrastructure and utility lines adjacent to new housing – 1000
- Payment instead of new housing construction – up to 2000
- Death of a relative – 1000

Victims have been given a choice of taking money as compensation for housing loss or opting for a new house, which the government would build for them. As the above list details, governmental budgetary expenditure appears to be more in case of the government building a new house. In this case cumulative expenditure on a house and utility infrastructure amounts for 3 million rubles, whereas maximum monetary compensation instead of a house provision is 2 million rubles.

Governmental statistics (as detailed in a letter to the Russian President by Minister for Regional Development dated October 13, 2010) specifies how the victims have chosen their compensation to be delivered:

- 2202 families (61%) opt for building a new house by the government
- 1061 families (29%) decided to take money instead of provision of a new house
- 139 families (4%) decided for provision of existing housing (usually located in a bigger settlement)

For further analysis we will assume that these figures can be translated into other categories with some approximation, resulting from the following uncertainties: (1) number of persons in families is unknown; (2) new houses are usually constructed in the same settlement where victims previously lived, usually on the same land lot which is in victims' property, however sometimes very small settlements where several houses were located before the fire were decided to be abandoned, and in this case new construction would take place in a bigger settlement in the same region; (3) detailed data on where the existing housing offered to vic-

tims is located was unavailable for this research; (4) there is no statistics on how monetary compensations have been spend by victims.

As the above data show, about 60% of victims are staying in the same settlements, or in the same region, thus they are not formally migrating. However governmental statistics on new houses construction specifies that 130 thousands of square meters of housing in 79 human settlements in 17 regions have been constructed. This means that new construction takes place in just 40% of affected settlements (their total number is 199 in 19 regions). This implies that many smaller settlements were abandoned. According to Ministry for Regional Development, they would prefer centralized construction that new infrastructure would be provided in most economical way. For example, for 60 families from 13 scarcely populated settlements in Nizegorodskaya Oblast (region) new houses have been constructed in a town of Bor, which is in the same region (but not in a proximity to all the 13 settlements).

About 30% of victims are not taking governmental help for a house construction, perhaps they migrate to a bigger settlement or to a city. The thesis that this category of victims has moved to cities is supported by the following analysis. It would be more money spend on a house in case of its construction by the government, than using monetary compensation, so if victims would like to stay in the same settlement it would be perhaps more economical to opt for a house built by government. Hence, if they take money, they aim to move.

Further uncertainties regarding this analysis, and one of them is a figure of about 10% of victims that are not listed under any category, can be attempted to be explained by the following two factors. Ministry for Regional Development is quoting a figure of 100 structures (houses, barns, sheds, garages) which legal property rights have not been clarified. Victims that receive monetary compensation might not spend it for acquisition of new housing. There have been reports in literature on risks of giving monetary compensations to people having social risks, like alcoholism.

6. Discussion

The discussion regarding natural disasters and urbanization in the context of wildfires in Russia poses two notable questions: (1) did urbanization happened as a result of wildfires?, and (2) did governmental response policies facilitated urbanization?

To answer the first question we can argue that wildfires resulted in more than 30% of victims migrated to urban settlements. This figure can be estimated higher and amount to about 50% as well, given facts that many new houses were constructed in bigger settlements, and many small villages were abandoned.

To discuss the second question we'd like to quote Mr. Viktor Basargin, Minister for Regional Development, giving his view on compensation policy to the disaster victims: "there are many [wildfire affected] settlements where there were just 5 to7 houses, so we think that abandoning these villages is appropriate from the fire safety and economical points of view. We suggest that persons from these villages should be moved to other rural settlements (and not big cities)." It is a very interesting quotation, since it brings several important points at once:

- The government has its view on and policy for victims' relocation. Victims were given some degree of choice where to settle, but the government has its policy to increase settlements size embedded into the compensation scheme.

- The government views abandoning of villages (which is essentially an urbanization process) as an adverse development.

- The government recognizes challenges associated with provisioning adequate statutory services in a very small settlements, namely schooling, medicine, and fire safety.

- As a tradeoff, government suggests "some degree" of urbanization – bigger villages and towns development policy. Migration from small villages is perceived as inevitable.

As a resume we can conclude that the Russian governmental policies favor some degree of urbanization and environmental migration in fire prone regions, viewing these processes as an opportunity for better and more cost effective protection of citizens against natural disasters.

Considering human settlements wildfire safety from a global environmental change perspective it is interesting to look at a concept of ecosystem services, which was comprehensively studied in the Millennium Ecosystem Assessment, 2006. This Assessment, enhanced by further studies, found deteriorating of many ecosystem services, including hydrological regulation (e.g. Turner et al, 2008), which means that forests ecosystems cannot prevent spread of fires in increasing number of regions. Bobylev, 2010, argues that ecosystem services to human welfare have been increasingly substituted by infrastructure services, like drinking water can be provided by ecosystems, but in majority of urban areas drinking water is currently provided by infrastructure using extensive technological processes. The author would argue that the case of wildfire safety is a similar one, and can be viewed through ecosystem and infrastructure services concept. Ecosystems are (or will be due to climate change) no longer able to prevent wildfires (in the regions usually not prone to wildfires), thus infrastructure should be put in place to protect human settlements from wildfires. This infrastructure

could include surface and groundwater management (dams, melioration, dikes, and ponds), artificial ground barriers (sand and gravel lanes), and forest flora species management (certain types of trees lanes adjacent to human settlements). This wildfire protection infrastructure requires considerable financial investments, and perhaps can be realistically provided just for big settlements, like towns or big villages. Thus urbanization is unavoidable from wildfire safety and land use points of view, and this issue should be considered in rural and urban regional development plans. Some approaches to mainstreaming infrastructure in land use planning practices can be found in Bobylev, 2009; Prasad at al, 2010; Wende at al, 2010.

7. Conclusions

There are some statistical indications and expert opinions (United Nations International Strategy for Disaster Reduction, 2009) that global environmental change will lead to increase in occurrence of extreme weather events, like floods, heat waves, strong winds. This will result in increase in the number of people migrating due to unfavorable environmental conditions – environmental refugees. As this case study of wildfires in Russia in summer 2010 have shown, about 30 to 50% of rural environmental refugees, or natural disasters victims are set to become urban dwellers. Thus, global environmental change can facilitate urbanization due to people migrating to bigger settlements seeking better protection from natural disasters. This has been not proofed for all disaster types, at least not in this article; but for wildfires and floods this migration towards urban areas seems logical because governments can provide better protection infrastructure in bigger settelments. This is justified by the costs of flood and fire protection infrastructure, which is more economical for urban environments than for sparsely populated areas.

A research conclusion that natural disasters facilitate urbanization correlates with other experts' opinions (e.g. reported by Satterthwaite, 2008) and with figures from other case studies. For instance, Bishawjit M, 2010, reports that 43% of Bangladeshi floods victims have migrated into cities.

In case of Russian wildfires "push" migration factors are quite strong and presented by destruction of livelihoods (forests), and governmental incentives for relocation. "Pull" factors are presented by better opportunities (including jobs) in urban areas.

Governments can manage migration in a disaster affected region by implementing specific policies of helping the victims. However these policies would represent just one of a "push"

and “pull” factors, and should live some space for individual decision making in accordance with human rights principles.

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