

The Role of Drought Risk Management Approach in Reducing Social – Economic Vulnerability of Farmers and Rural Regions

Case Study: Sulduz Rural District, Azarbaijan Gharbi

Poortaheri M.*

Assistant Prof. in Geography and Rural Planning, Tarbiat Modares University

Eftekhari A.R.

Associate Prof. in Geography and Rural Planning, Tarbiat Modares University

Kazemi N.

M.Sc. in Geography and Rural Planning, Tarbiat Modares University

Received: 29/01/2012

Accepted: 29/01/2013

Extended Abstract

Introduction

Natural hazards are indeed geophysical events, such as earthquakes, volcanic activity, flooding, etc. They have the characteristic of posing danger to the different social entities of our planet. Nevertheless, this danger is not only the result of the process per se (natural vulnerability), but also it is the result of the human systems and their associated vulnerabilities towards them (human vulnerability). Natural hazards are threatening events that if they happen and leave damages and injuries to the human population which they exposed to the risk, they are called natural disasters. The occurrence of natural hazards in every community leads to damages and injuries caused by disaster so that will lead to poverty in various dimensions. For this reason, studying the risks of these disasters has grown considerably nowadays. Consequences of natural disasters lead to physical, social and economic

* Responsible Author: madit@modares.ac.ir

Archiving of SID

damages and negative impacts leave on natural and human systems body. Although we cannot completely mitigate the damages caused by natural disasters but by studying and planning in this field we can reduce their vulnerability. Vulnerability is a rank and degree that shows the power of a community against disasters. Vulnerability contains three main characteristic: expose, it means be at risk, critical and threatening conditions. Capability or the rate of access to resources in order to deal with this situation. Resilience or the ability to use resources to deal with critical consequences and outcomes. Droughts are recognized as environmental disasters and have attracted the attention of environmentalists, ecologists, hydrologists, meteorologists, geologists and agricultural scientists. Droughts occur in virtually all climatic zones, such as the areas with high and low rainfalls, and are mostly related to the reduction in the amount of precipitation received over an extended period of time. Droughts produce a complex web of impacts that span many sectors of the society, including economy and may reach well beyond the area experiencing a drought. It is among the most important natural hazards in Iran, because the country is located in the Earth the desert belt. According to the United Nations report, Iran is one of the most critical countries which will be involved water shortages in the future. Agriculture is among the most important foundations of its economy and can be affected by drought. Rural communities' severities are influenced by climatic conditions. Limited economic of water value, increasing of demand value with population growth and its high consumption in agriculture to other sectors lead to emerging problem of water shortage. This problem has attracted the attention of many experts. During recent years this issue has become more important, because Iran has been faced with frequent droughts.

Methodology

In this study, vulnerability of drought in rural communities was investigated as a central point for agriculture. Increasing the awareness about the costs of economic – social and environmental drought leading to development of an active view on drought risk management in developing countries and the developed ones. The

Archive of SID
present study is seeking reduce the vulnerability of rural farmers by management of drought risks. Therefore, at the beginning the levels of vulnerability have been studied in economical, social and environment sections.

Results

The results indicated that the economic – social factors have been among the most important ones. In order to achieve the goals, literature review and field survey methods have been used. Sulduz rural district in west Azarbaijan province was the statistical society of the study. Therefore ten villages were selected as samples. This selection was carried out considering the criteria such as the distance from the main city, information of township disasters center, type of agricultural land and population. According to Cochran formula, 300 questionnaires were filled randomly. Also in order to evaluate effects of drought risk management on decreasing of vulnerability, 30 questionnaires were filled by local governors. Data were analyzed using different statistical methods such as comparison of averages, T-test and Friedman and variance analysis in SPSS software.

Conclusion

The results of present work showed that the socio-economic factors have acted most important roles in vulnerability. Also it was found that drought risk management is an appropriate approach for reducing the vulnerability. Finally, according to theoretical concepts and field -studies, the research results showed that the drought risk management formed a proper approach in order to reduce economic and social vulnerability in the studied villages for reducing the consequences and damages of drought.

Keywords: Economic vulnerability, Social vulnerability, Drought, Risk Management, Rural Areas.

References *Archive of SID*

- Araya, A., Stroosnijder, Leo, 2011, **Assessing Drought Risk And Irrigation Need in Northern Ethiopia**, Agricultural and Forest Meteorology, Vol. 151, Issue 4, PP. 425-436.
- Batabyal, A.A., Beladi, H., 2001, **Aspects of the Theory of Financial Risk Management for Natural Disasters**, Applied Mathematics Letters, vol, 14, Issue 7, PP. 875-880.
- Berg, Marrit van den, 2010, **Household Income Strategies and Natural Disasters: Dynamic Livelihoods in Rural Nicaragua**, Ecological Economics. Vol 69, issue 3, PP. 592- 602.
- Birkmann Jorn, 2011, **First- and Second-Order Adaptation to Natural Hazards and Extreme Events in the context of climate change**, Natural Hazards, Vol. 58, Number 2, PP. 811- 840.
- Campbell, Donovan, Barker, David, McGregor, Duncan, 2011, **Dealing with Drought: Small Farmers and Environmental Hazards in Southern St. Elizabeth**, Jamaica, Applied Geography, Vol. 31, issue 1, PP. 146- 158.
- Chenar, A.R., 2010, **Evaluation and Monitoring of Drought in Sharghi Azarbaijan, Gharbi Azarbaijan, Ardabil by Using Images AVHRR**, Tarbiyat Modares University, M.A. Thesis Remote Sensing and GIS.
- Dyke, G., Gill., S, Davies, R., Betorz, F., Andalsvik, Y., Cackler, J., DosSantos W., Dunlop, K., Ferreira I., Kebe F., Lamboglia E., Matsubara Y., Nikolaidis V., Ostoja-Starzewski S., Sakita M., Verstappen. N., 2011, **Dream project: Applications of Earth Observations to Disaster Risk Management**, Acta Astronautica, Vol. 68, Issues 1-2, PP. 301-315.
- Hochrainer, Stefan, Mechler, Reinhard, 2011, **Natural Disaster Risk in Asian Megacities: A Case for risk pooling? Cities**, Vol. 28, issue 1, PP. 53- 61.

- Hristidis Vagelis, Chen Shu-Ching, Li Tao, Luis Steven, Deng Yi, 2010, **Survey of Data Management and Analysis in Disaster Situations**, Journal of Systems and Software, Vol 83, Issue 10, PP. 1701- 1714.
- Kampragou, Eleni, Apostolaki, Styliani, Manoli, Eleni, Froebrich, Jochen, Assimacopoulos. Dionysis, 2011, **Towards the Harmonization of water-Related Policies for managing Drought Risks Across the EU**, Environmental Science & Policy, Vol. 14, Issue 7, PP. 815- 824.
- Keramati, A., Meshki, H., Nazari Shirkooh, S., 2010, **Identify and Prioritize Risk Factors for CRM Implementation Projects in Iran**, Business Research, Vol. 51, PP. 199-240.
- Keshavarz, M., Karami, Z., 2009, **Factors Influencing the Management of Agricultural Drought and its Consequences: the Application Model**, Agricultural Sciences and Natural Resources, Vol. 12, No. 43, PP. 283-267.
- Kholová, Jana, Hash, C. Tom, Kočová, Marie, Vadez, Vincent, 2011, **Does a Terminal Drought Tolerance QTL contribute to Differences in ROS Scavenging Enzymes and Photosynthetic Pigments in Pearl Millet Exposed to Drought?**, Environmental and Experimental Botany, Vol. 71, Issue 1, PP. 99-106.
- Kim, Dea Ha, Yoo, Chulsang, Kim, Tae- Woong, 2011, **Application of Spatial EOF and Multivariate Time Series Model for Evaluating Agricultural Drought Vulnerability in Korea**, Advances in Water Resources, Vol. 34, Issue 3, PP. 340- 350.
- Lal, Pankaj, Alavalapati, Janaki, R.R., Mercer, Evan D. , 2011, **Socio- Economic Impacts of Climate Change on Rural United States, Mitigation and Adaptation Strategies for Global change**, Vol. 16, Issue 7, PP. 819- 844.
- Lazarus, Naomi, W., 2011, **Coping Capacities and Rural Livelihoods: Challenges to Community Risk Management in Southern Sri Lanka**, Applied Geography, Vol. 31, Issue 1, PP. 20-34.

- Mansourian, A., Rajabifard, A., Valadan Zoej, M.J., Williamson I., 2006, **Using GIS and Web-based System to Facilitate Disaster Management**, Computers & Geosciences, PP. 303-315.
- Mohammadi Yeganeh, B., Hakim Doost, Yasser, 2010, **The Economic Effects of Drought and its Impact on Rural Instability, Case Study: Ghare Pashtooy Bala**, the Regional Conference on Water and Drought Crisis, Rasht Islamic Azad University.
- Molen, M.K. et al., 2011, **Drought and Ecosystem Carbon Cycling, Agricultural and Forest Meteorology**, Vol. 151, issue 7, PP. 765- 773.
- Nouri, J., Mansouri N, Abbaspour, M., Karbassi, A.R., Omidvari, M., 2011, **Designing a Developed Model for Assessing the Disaster Induced Vulnerability Value in Educational Centers**, Safety Science, Vol. 49, Issue 3, PP. 679-685.
- Pittman, Jeremy, Wittrock. Virginia, Kulshreshtha, Surendra, Wheaton, Elaine, 2011, **Vulnerability to Climate Change in Rural Saskatchewan: Case study of the Rural Municipality of Rudy**, No. 284, Journal of Rural Studies, Vol. 27, issue 1, PP. 83- 94.
- Shahnuoshi, N., Dastjerdi, Samaneh, Darijani, A., Davari, Kamran, 2010, **Drought Risk Management for Sustainable Use of Agricultural Resources in the Province Golestan**, Meeting Qualitative and Quantitative Stability of the Country's Water Resources, The Islamic Republic of Iran Academy of Sciences.
- Sharafi, Lida and Zarafshani, Kiumarth, 2011, **Vulnerability Assessment, the Point of Drought Risk Management, Case Study: Sar pol Zahhab, Islamabad Gharb**, Journal of Regional Planning, Vol. 1, issue 1, PP. 56-43.
- Speranze, Chinwe Ifejika, Kiteme Boniface, Wiesmann, Urs, 2008, **Drought and Famines: the Underlying Factors and the Causal Links Among Agro-pastoral Households in Semi-arid Makueni District, Kenya**, Global Environmental Change, Vol 18, issue 1, PP. 220-233.

- Stanganelli, MariaLuca, 2008, **A New Pattern of Risk: the Hyogo Framework for Action and Italian Practice**, Socio- Economic planning sciences, Vol. 42, issue 2, PP. 92- 111.
- Tabatabai, Forogh, 2007, **Study the Factors Affecting in Progression of Risk Management at the Industrial farm of Tehran**, Tarbiat Modarres University, M.A. thesis Agricultural and Education.
- Taqvae, M., Ghaffari, R., 2007, **The Prioritization of the Crisis in Rural Settlements (AHP) (Case study: Bazoft district)**, Journal of Human Sciences, Vol. 20, Issue 1, PP. 74-47.
- Tatli, Hasan, Turkes, Murat, 2011, **Empirical Orthogonal Function Analysis of the Palmer Drought Indices**, Agricultural and Forest Meteorology, Vol. 151, issue 7, PP. 981- 991.
- Tompkins, Emma, L., Lemos, Maria Carmen, Boyd, Emily, 2008, **A Less Disastrous Disaster: Managing Response to Climate-Driven Hazards in the Cayman Islands and NE Brazil**, Global Environmental Change, Vol. 18, issue 4, PP. 736-745.
- Wilhite Donald A., 1996, **Reducing the Impacts of Drought: Progress toward Risk Management, Climate Variability, Climate Change and Social Vulnerability in the Semi-arid Tropics**, World Resources Institute, Washington DC, PP. 147-164.
- Zhang, Jiquan, 2004, **Risk Assessment of Drought Disaster in the Maize-Growing Region of Songliao Plain, China**, Agriculture, Ecosystems & Environment, Vol. 102, Issue 2, PP. 133-153.