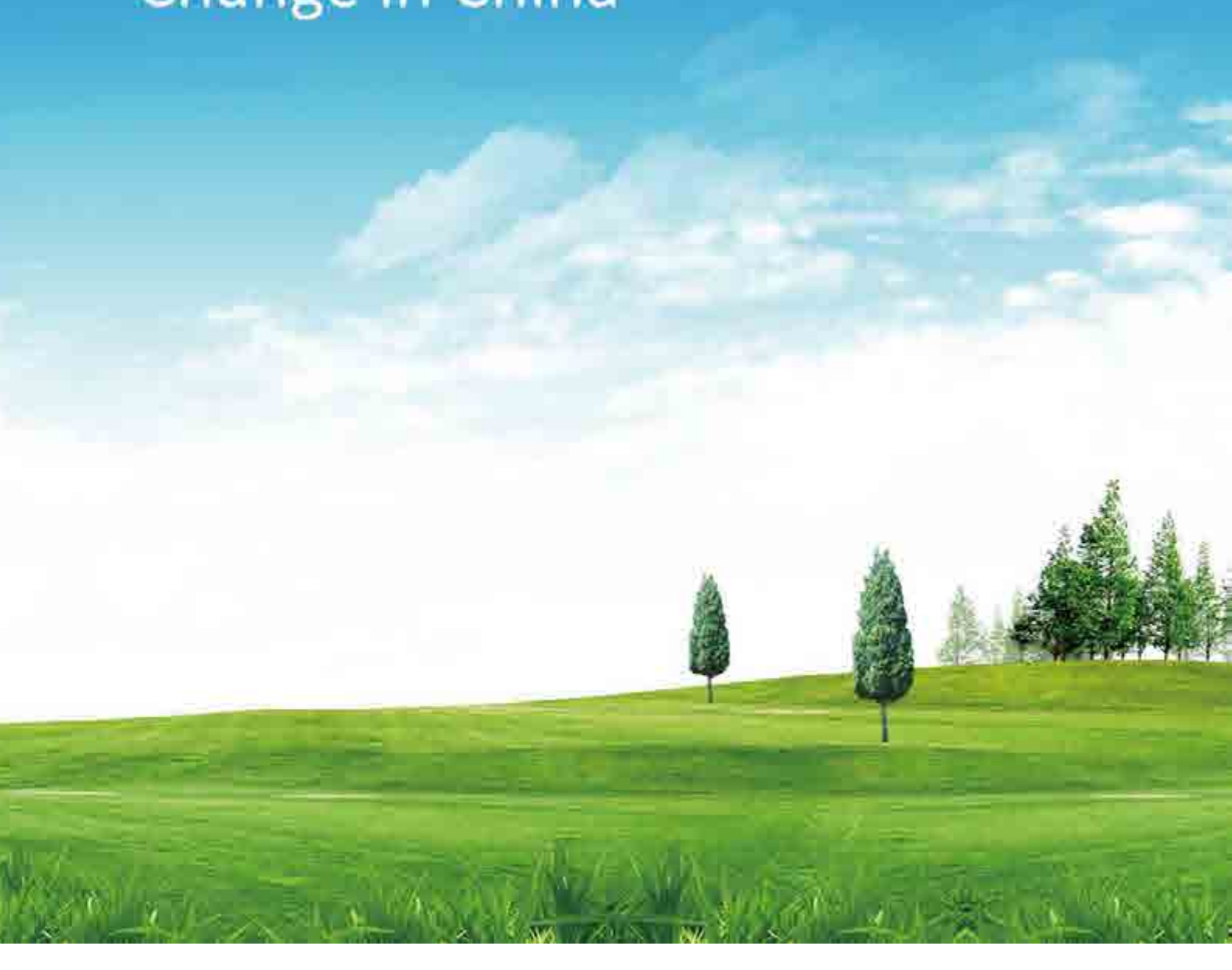


Gender Dimensions of Vulnerability to Climate Change in China



Foreword

Climate change has become one of the biggest challenges to achieving sustainable development today. Climate change and its related disasters, including extreme weather events, impact not only on the environment but also on economic and social development.

While there is no denying that climate change and climate-related disasters do not discriminate, their impacts, including extreme and erratic weather events, are felt differently by women and men. Globally, when disasters strike, women are more likely than men to die and be most adversely affected. Women's limited access to resources such as information, livelihoods, technology, combined with other prevailing gender inequalities, worsen women's coping and adaptive capacity. Although women and girls are key agents of change, their participation in relevant decision-making at all levels is limited, further undermining their ability to influence and shape measures designed to address climate change.

The year 2015 was a pivotal year in regard to international commitments to address climate change and disaster risks. On 18 March 2015, the Sendai Framework for Disaster Risk Reduction was adopted at the Third UN World Conference on Disaster Risk Reduction, while on 12 December, 195 countries adopted the historic Paris Climate Agreement. Importantly, they both recognize the gender dimensions of climate change and disasters and call for parties to adopt a gender-responsive approach in addressing climate change and reducing disaster risks.

These international landmark commitments are extremely relevant to Asia, which is the world's most disaster-prone region, with climate change further worsening the region's precarious situation. China, with its large and diverse geographical area, is vulnerable to various climate change impacts and disasters, including droughts, floods, typhoons as well as hot and cold weather extremes. Being a global leader in renewable energy investments, the country is also an important actor in addressing climate change and reducing disaster risks. As one of the founding principles of the People's Republic of China, promoting gender equality is also an important priority for the country. Important strides with respect to women's advancement have been made, as evidenced by rankings such as 40 out of 188 countries in UNDP's Gender Inequality Index in 2014. However, there is still scope for improvement in areas such as access to equal employment, political participation and elimination of domestic violence.

In recognition that we cannot achieve sustainable development unless we address the needs and rights of all the different groups of people affected by climate change, this research report helps to better understand how gender equality, climate change and disaster risks intersect in China. With concrete data on gender differences and recommendations for action, the report seeks to launch a discussion on how China can implement its international commitments to integrate gender into climate change action and disaster risk reduction over the coming years. UN Women is committed to promoting gender equality and to ensuring that women's voices and priorities shape climate change discourse and action. For this reason, we are pleased to be collaborating with the Policy Research Center for Environment and Economy (PRCEE) on this research, and look forward to further working with Chinese stakeholders and other development partners to ensure that the research results inform sustainable development policy-making and programming in China.



Miwa Kato, Regional Director for Asia and the Pacific
and Representative in Thailand, UN Women

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Gender Dimensions of Vulnerability to Climate Change in China team
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List of Acronyms

UN Women	United Nations Entity for Gender Equality and the Empowerment of Women
MEP	Ministry of Environmental Protection
CC	Climate Change
DRR	Disaster Risk Reduction
MCA	Ministry of Civil Affairs
NCDR	China National Commission for Disaster Reduction
NDRC	National Development and Reform Commission
NRDC	Natural Resources Defense Council
NGOs	Non-Governmental Organizations

Summary

The project “Gender Dimensions of Vulnerability to Climate Change in China” reviewed policy documents and policy assessment reports published since 1992 (when China joined the International Framework Convention on Climate Change), interviewed 78 government officials at all levels and 6 NGO leaders, and surveyed 3402 villagers across 196 villages in 8 counties of Jiangsu, Qinghai, and Shaanxi Provinces.

The purpose of the project was to analyze gender gaps in China’s current approach to climate change and disaster reduction and to formulate recommendations for promoting gender mainstreaming, enhancing women’s empowerment, and achieving gender equality. The main findings are as follows:

1. Policies, regulations and frameworks of CC and DRR and their gender awareness gaps

First, China has made general arrangements for the mitigation of, and adaption to, climate change by improving organization systems, institutional capacities, and financial and technical support. The main focus has been on technical and engineering projects. The policy systems catalogue various technical and engineering projects. The technical and engineering policy systems do not cover the management of individuals and groups involved.

Second, the government-led policies relating to DRR mainly focus on reductions in vulnerabilities to disaster. Recent progress in addressing gender issues includes the inclusion of gender-related indicators in disaster statistics and gradually taking women’s needs into account in the storage and distribution of relief materials at the local level.

Third, gender awareness of climate change is gradually being strengthened and improved in social welfare guarantee policies, specifically regarding women’s vulnerabilities. For example, China’s Five Year Plans for National Economic and Social Development have specific requirements for the rights and interests of disadvantaged groups such as women, children, the elderly and the disabled. China’s Twenty-First Agenda - White Paper outlined a comprehensive plan to protect the rights and interests of women and to give women roles in environmental protection.

Fourth, although the China National Program for Women’s Development 2001-2010 and the China

National Program for Women’s Development 2011-2020 do not explicitly mention “climate change and disaster prevention and mitigation”, the former did present main objectives and relevant measures in the sixth priority field “Women and Environment”. The latter continues to set “Women and the Environment” as one of its seven major topics and includes four goals addressing climate change.

Fifth, to protect women’s equal rights with regard to decision-making, education and economic capability, specific laws and regulations have been issued in China: the Women’s Rights and Interests Protection Act stipulates equal political rights, cultural and educational rights, labor and social welfare security rights, rights and interests of property and marriage as well as family rights; the Electoral Law of the National People’s Congress and Local People’s Congresses at Various Levels stipulates that in the National People’s Congress and the local people’s congresses at various levels, there should be an appropriate number of women deputies, and the proportion of women representatives should increase gradually; The Notice on Earnestly Safeguarding the Rights and Interests of Rural Women’s Land Contract (Central Office 2001, No.9) stipulates that the rural land contract must be followed to ensure gender equality and must not allow any discrimination against women. However, there is ample room to improve the implementation of these policies.

2. Gender situation of relevant government departments addressing CC and DRR Conclusion

Conclusion 2.1 Interviewed officials' opinions on gender differences

First, interviewed officials think that women can do the same work as men and that there is no difference between the work capacities of men and women. However, when it comes to conducting work specifically, they believe it is necessary to consider the differences between genders. For example, men prefer to assume heavier and harder work burdens because they are more inclined to take care of and protect women.

Second, interviewed officials generally think that there are no gender differences in the extent of the impacts brought about by climate change and related disasters. They consider those negative effects to mainly exist among poor populations, children, the elderly, weak people, the ill and the disabled. They do not recognize that women are disadvantaged in terms of, for example, accessing resources useful to cope with the adverse impacts of climate change.

Conclusion 2.2 Female officials' status

First, based on samll sample analysis, in the interviewed government departments at the municipal and county levels, the proportion of female staff and officials is relatively low in comprehensive coordination departments. The proportion of female officials is the highest in the social management department, followed by the relevant service management department.

Second, in general, the proportion of female mid-level and high-level officials is lower than that of female staff in relevant institutions.

Third, interviewees generally lack training opportunities on climate change. Training about disaster mitigation is much more common than those about climate change. In all training sessions, the proportion of male officials is higher than the proportion of females.

Conclusion 2.3 The role of the Women's Federation

From the work conducted, the Women's Federation evidently plays an important role in promoting the development of women.

3. Gendered vulnerabilities to CC and DRR

Conclusion 3.1 Populations vulnerable to climate change and disaster risks

First, most of the survey village respondents, including women themselves, do not think that women are vulnerable.

Second, in terms of climate change and disasters' impacts on agricultural livelihoods, young families and low-income families are vulnerable groups, and those who rely more on female labor, are slightly more vulnerable.

Third, in terms of the labor input affected by climate change, females are slightly more vulnerable than males, but not significantly.

Fourth, considering vulnerability factors such as social roles and access to resources and information, women are more vulnerable to climate change and

disasters than men. For example, gender differences were found in terms of incomes, land allocation and loan qualification, as well as in access to off-farm employment, training and early warning information. Women also know less than men about their communities' disaster prevention and mitigation facilities.

Conclusion 3.2 Women's roles, opportunities and abilities in family and community affairs

First, within their families, women have less decision-making power on issues other than daily expenses.

Second, women have fewer opportunities to participate in their communities' public affairs, and their confidence in expressing themselves is significantly lower than that of men.

4. Role of NGOs and grassroots organizations in DRR and adaptation to CC

Conclusion 4.1 Patterns of activities conducted by NGOs

First, international NGOs in China mainly focus their efforts on tracking international climate change negotiations and providing humanitarian relief for natural disasters.

Second, domestic NGOs mainly focus on promotion/advertising/training to enhance public awareness, track pollution and to create a platform of dialogue for the government, enterprises and communities; their work on climate change and gender mainstreaming should be strengthened.

Third, NGOs' common communications with government authorities include reports, program studies and pilots. Moreover, letters, visits and administrative reconsideration were sometimes used by some NGOs.

Conclusion 4.2. Difficulties the interviewed NGOs encountered

First, international NGOs faced some difficulties related to registration.

Second, according to the interviewed NGOs, it is very difficult to change some government officials' views and ideas, which is the main obstacle when NGOs try to promote their good ideas and new concepts during the implementation of cooperative projects.

Third, misunderstandings and bad impressions among the three parties of government, enterprises and communities are the main difficulties for NGOs trying to carry out their coordination and communication work, which requires abundant patience and communication skills in solving problems.

Fourth, financing is a major problem faced by local NGOs. To maintain their independence, they cannot obtain funds from the government or enterprises, however private charities' support for local NGOs is not sufficient so far.

Conclusion 4.3. Lessons from interviewed NGOs

First, by advocating and carrying out cooperative projects together with the local community, NGOs can bring good ideas, new concepts and technologies to local areas.

Second, before starting community projects and disaster relief, evaluation meetings about villagers' needs should be conducted for males and females separately to fully understand the special and real needs of vulnerable groups.

Third, specific training services should be provided for women to increase local women's participation and effectiveness regarding political issues.

Fourth, large-scale advocacy events should be held to help the media and local people understand the project and its purpose.

Fifth, NGOs at the international and national levels should cooperate with local NGOs or grassroots organizations when carrying out local activities. On the one hand, this can promote the growth of local organizations, and on the other hand, it can improve the effectiveness of the activities.

Sixth, a specific team should be established to communicate with the government.

Seventh, the abilities and influence of NGOs could be steadily promoted by establishing and extending examples of community cooperation.

5. Policy recommendations on enhancing gender sensitivity

Conclusion 5.1. Recommendations for China's government departments

First, mainstream gender considerations, as well as the rights of other vulnerable groups, into national and sub-national climate change and disaster risk reduction policies, strategies and programs. Shift away from representing women solely as "vulnerable" in the climate change and DRR context to

viewing them as "active agents" who must have an equal say in the design, decision-making and implementation of relevant plans and actions.

Second, enhance gender-responsive implementation of climate change and DRR interventions by conducting gender and vulnerability analysis at the design stage and establishing sex-disaggregated baselines, indicators and targets.

Third, municipal- and county-level governments should provide more regular training opportunities on knowledge and techniques for coping with climate change, as well as training on gendered perspectives for relevant department staff and officials, to improve the capabilities and results of climate change policy implementation.

Fourth, from national to local levels, the Women's Federation should be fully involved; this can be accomplished by increasing the Federation's funding and enhancing knowledge of coping with climate change among Women's Federation officials.

Fifth, during the implementation of policies guaranteeing women's land rights and interests, full attention should be given to the influences of traditional marriage customs on women's land rights to reduce the number of cases in which women lose land rights.

Sixth, integrate sex-disaggregated indicators and gender impact analysis into the sub-national authorities' reporting requirements on the implementation of climate change and DRR policies to ensure that the gender issues identified are fed back to the people responsible for policy adjustment at macro-level.

Seventh, ensure that the collection of sex, age and disability disaggregated data in disaster contexts is frequently analyzed, disseminated widely, and used to inform, monitor and evaluate new policies and programs.

Eighth, climate change and disaster agencies should seek to collaborate with agencies that have expertise in gender mainstreaming to promote integration of gender differences across climate change and disaster governance, utilizing best practices from other countries, when available.

Conclusion 5.2. Recommendations for NGOs

First, domestic environmental NGOs should consider engaging in more activities related to climate change and enhancing their awareness of gender.

Second, when engaging in climate change-relevant activities, NGOs should increase their cooperation and communication with each other.

Conclusion 5.3. Recommendations for UN Women

First, strengthen cooperation between UN Women and key government institutions in charge of the management of climate change and disaster reduction to ensure there is a prominent focus on gender

and vulnerable groups when implementing policy. Second, enhance communication and information exchanges between UN Women and provincial-level government authorities. State-level government authorities are responsible for policy formation, while municipal or lower-level government authorities are responsible for policy implementation. From the perspective of China's administrative management system, the provincial level is the best entry point to participate in because it influences the adjustment and implementation of policies within provincial areas.

Third, communication with the government based on projects is the most effective way to consider gender and climate change when choosing and implementing pilot projects. The main methods could be case studies, pilot projects and capacity building. For pilot projects, Oxfam's project experience could be studied to learn how to cooperate with local governments by conducting projects that participate in or directly impact the government's policy implementation.

Fourth, enhance officials' training and skills regarding gender by utilizing different training methods for officials at different levels. Because it is difficult to participate directly in the training of provincial-level officials, it might be effective to establish a relationship with the official trainers and educate them, and then have them train the officials. The training provided for municipal and county-level officials is generally organized by a superior organization or carried out with the help of a college or university and cadre training school, etc.

Fifth, at the community level, strengthen instructional training and professional skills among women and vulnerable groups about making a living and participating in decision-making, rather than conducting simple consciousness training. The goal of these training sessions is to improve vulnerable groups' capacity to combat climate change and disasters. In training sessions about consciousness, more attention should be paid to women's self-confidence and coping capacity. For example, advocate that males and females share the housework or provide some home-based training to avoid situations in which women cannot attend training because of heavy household burdens. Also, design training materials that are suitable for women.

Introduction

The crisis of global warming is becoming a challenge that threatens all human beings. Drought, wind-storms, flooding, melting glaciers, rising sea levels and other disasters resulting from climate change are not only occurring more frequently, they are also becoming more serious and harmful. China, with its complex climatic conditions and fragile ecological environment, is vulnerable to climate change. In accordance with the Third National Assessment Report on Climate Change of the People's Republic of China¹, the temperature series of the last 100 years shows that China's mean temperature from 1909-2011 increased by 0.9-1.5 degrees Celsius, which is slightly higher than the rise in global temperature over the same period. Meanwhile, the average annual precipitation throughout the whole country shows no significant variations, but there are obvious regional distribution differences. To be more specific, during the last 30 years, precipitation in China's western arid and semi-arid areas increased continuously. The rate of sea level rise on China's coast from 1980 to 2012 was 2.9 mm/a, higher than the global average rate. From the 1970s to the early twenty-first century, glacier areas decreased by approximately 10.1%, and the area of frozen soil decreased by approximately 18.6%. Warm extremes in mainland China have increased, extreme cold events have obviously decreased, and the frequency/extent of meteorological drought events has increased. Among all types of natural risks, disasters related to extreme weather and climate events accounted for more than 70%; losses due to disasters are increasing, which intensifies poverty issues and directly threatens poor populations. Under these conditions, the adverse effects of climate change on agriculture, cities, traffic, infrastructure, the South-to-North Water Diversion Project, power grids and other energy infrastructures is becoming increasingly obvious. In the future, overall water resources will likely be reduced by 5%, the Food Security Index shows an increasing trend after a slight decrease, and water security, ecological security, food security, energy security, etc. will be intertwined and become more complicated under

the impact of climate change. The IPCC's fifth Assessment Working Group II report Climate Change 2014: Impacts, Adaptation and Vulnerability noted that, with the continuous increase in the degree of climate warming, the difficulty of managing the impacts and risks is also growing, but opportunities for coping with these risks still exist. This report also notes that the nature of the risk of climate change is becoming increasingly obvious, and the risk is attributed to the cumulated influences of vulnerability (lack of preparation), degree of exposure (people or assets in danger) and all types of hazards (triggered by climatic events or trends). The Paris Agreement, an agreement within the United Nations Framework Convention on Climate Change (hereafter UNFCCC) adopted by 195 members in December 2015, proposes that all signed parties should respect, promote and consider the rights of vulnerable groups and equality among groups when making policies and taking action. Governmental responsibility for improving gender equality and women's empowerment is specifically mentioned. An increasing amount of literature now suggests that the impacts of climate change and related disasters exacerbate gender differences; to be more specific, women tended to be affected more adversely by climate change than men^{2,3,4,5,6}. In China, agriculture is more sensitive to climate change than any other area, and the feminization of agricultural labor has been demonstrated by many researchers. According to the China Gender Equality and Women's Development White Paper, in rural areas, women's labor accounted for approximately 70% of the agricultural labor force⁷. For example, in the most agriculturally feminized province, Jiangsu Province, women make up more than 60% of agricultural labor. However, they are likely to lose their land rights⁸. Although women are filling more seats on their village committees (from 15% in 2000 to 22.7% in 2013), in general, women's leadership status is still very low⁹. UN Women believes that climate change, environmental issues, gender equality and sustainable development are highly interrelated. It is therefore essential that CC and DRR policies and measures be

designed in a way that ensure women become full and equal partners as well as beneficiaries. Therefore, in 2015 UN Women proposed to undertake a research study on how Chinese people's vulnerabilities to climate change and disaster impacts are gendered, and how these gendered vulnerabilities intersect with other vulnerabilities, such as those caused by age, disability, poverty, and minority status, with special attention to populations dependent on agricultural livelihoods. The purpose of the project "Gender Dimensions of Vulnerability to Climate Change in China" is to identify how the socially defined roles of women and men determine different vulnerabilities and capacities to address and deal with climate change. It can also technically support advocacy for more equitable, efficient and sustainable CC and DRR policy and intervention that are conscious of gender differences. Thus, the project is important in reducing vulnerability to climate change and in promoting women's empowerment.

The project was initiated and led by UN Women and fulfilled by "Gender Dimensions of Vulnerability to Climate Change in China" project team organized by Policy Research Center for Environment and Economy. This report summarizes the main findings of the research. The first section analyzes the gender gaps in the policies, regulations and framework for coping with climate change and related disasters. The second section discusses officials' gender sensitivity in the context of adaptation to climate change and related disasters. In the third section, NGOs and grassroots organizations' roles in coping with climate change are discussed based on interviews. In the fourth section, results of the survey about Chinese villagers' gendered vulnerability to climate change and disaster are analyzed. In the last section, policy recommendations for enhancing gender sensitivity in policies for coping with climate change and disaster risks are proposed for China's government and UN Women.

¹ The Third National Assessment Report on Climate Change of P.R.C., 2015.

² MacGregor, S., 2010.

³ Alyson B and et al, 2008.

⁴ UNIFEM, 2005.

⁵ Eric Neumayer and Thomas Plümper, 2007.

⁶ Zoë Pelter and Chiara Capraro, 2015.

⁷ The State Council Information Office of P.R.C, 2015.

⁸ Qian Wenrong, Mao Yingchun, 2005.

⁹ The State Council Information Office of P.R.C, 2015.

1.China's policy and regulation system, as well as its gender awareness gaps

1.1 Framework of organizations and policies for coping with CC and DRR

1.1.1 Framework of organizations and policies for coping with CC

Since China joined the UNFCCC in 1992, the country has formulated a large number of relevant policies to cope with climate change, forming a national strategy to address climate change and a National Leading Group on climate change¹⁰. This group uses a "top-driving, administrative-led" top-down system for coping with climate change. The National Development and Reform Commission, the Ministry of Foreign Affairs, the Ministry of Science and Technology and the China Meteorology Administration are key government agencies working on addressing climate change.

After China's Twenty-First Century Agenda -- White Paper (Document of State Council (1994) No. 37) was issued in 1994, the Program for Sustainable Development of China in the Early Twenty-First Century (2003), the National Climate Change Program (2007), National Climate Change Adaptation Strategy (2013), National Planning on Addressing Climate Change (2014-2020) and many other documents were issued in succession. Currently, the Climate Change Law is a subject of ongoing debate. By 2009, provincial climate change programs were established in all of China's 31 provinces, autonomous regions and municipalities, forming an organizational system for addressing climate change; a climate change monitoring network and information system were also established. A series of projects, such as a statistical accounting system for greenhouse gasses, a regional low carbon pilot program, industrial low carbon development, carbon-emissions trading and various types of pilot projects, as well as public awareness and participation projects, were conducted.

In the field of climate change mitigation, policies were implemented mainly through energy conservation, renewable energy, nuclear power, coal electricity, coal / coal gas and more, thus promoting alternative energy and energy conservation, increasing carbon sinks and controlling greenhouse gas emissions; these projects were driven mainly by the National Development and Reform Commission and the Ministry of Industry and Information.

In the field of climate change adaptation, ecological environmental protection policies and disaster prevention and reduction policies are attracting even more attention. These policies are driven by the Forestry Administration, Ministry of Agriculture, National Disaster Reduction Center, etc.

In summary, China has made general arrangements for the mitigation of, and adaptation to, climate change through improving organization systems, institutional capacities, and financial and technical support. The main focus has been on technical and engineering projects. The policy systems catalogue various technical and engineering projects. The technical and engineering systems do not cover the management of individuals and groups involved.

1.1.2 Framework of organizations and policies in DRR

In the field of disaster reduction and prevention, China has established a disaster prevention, reduction and relief system under the unified leadership of the government, dividing responsibility among departments; the system includes graded management of disaster and territorial management. As part of this system, the National Disaster Reduction Committee was established. The committee consists

of 35 member departments, including the Ministry of Civil Affairs, Ministry of Land and Resources, Ministry of Water Resources, Ministry of Agriculture, Bureau of Meteorology, Bureau of Oceanography, and Bureau of Seismology. Laws, regulations and normative documents relating to disaster prevention and mitigation have been issued which cover the whole process of disaster reduction management from pre-disaster preparation, to emergency responses, to post-disaster restoration at both national and local levels. Legislation concerns different disasters such as earthquakes, geological disasters, marine disasters, biological disasters and forest and grassland fires. Moreover, during the 11th Five-Year Plan, China amended and enacted the Law on Protecting Against and Mitigating Earthquake Disasters, the Law on Response to Emergencies, Regulation on Natural Disaster Relief, and more.

In the process of pre-disaster preparation, there are clear regulations on material reserves for disaster relief, disaster monitoring and disaster warnings. There are 19 central disaster relief material reserve warehouses nationwide and 14 varieties of 3 major categories of disaster relief materials. Local disaster relief material reserve warehouses have also been set up in all provinces (autonomous regions and municipalities) and disaster-prone cities and counties (districts), and a reserve system covering the "central government – province – city - country" levels has essentially been established. For disaster monitoring and warnings, monitoring networks have been established, and the National Disaster Reduction Committee takes charge of managing and disclosing information; all other relevant departments take charge of maintenance. In the process of post-disaster restoration, women and vulnerable groups have been included in the statistics on natural disasters, and greater understanding has been achieved regarding requirements for disaster relief subsidies and post-disaster restoration.

Regarding the emergency management of disaster

relief, Article 7 in the National Natural Disaster Relief Emergency Plan (hereafter NNDREP) and Article 38 in the Weather Disaster Prevention Act stipulate that the Ministry of Public Security is responsible for the social security of the disaster area; it must assist in organizing people in disaster areas to move to safe places and participate in other relevant relief work. The headquarters of the Chinese People's Armed Police Force must manage the organization and coordination of the army, armed police, militia and reserves to participate in disaster relief, assisting the local government to transport, load and unload, and distribute relief supplies when necessary. Military Regulation about Participation in Rescue and Relief include specific provisions concerning the main tasks the military should complete during disaster relief, and it also states that, when necessary, the military can implement relief immediately and report to superiors at mean time before get approval to seize decisive opportunities for intervention. In addition, the regulation also states that the military should practice its relief strategies and study disasters. Moreover, General Emergency Plan for the Army to Address Emergencies has also been issued.

The government's responsibility has also been clarified within NNDREP. Article 29 in the Natural Disaster Relief Act stipulates that government officials who fail to organize the transfer of affected persons in a timely manner during disasters, or fail to provide basic living assistance and reconstruction, will be punished in accordance with the law. The Emergency Response Law stipulates that governments at the county level shall be responsible for emergency response in the administrative region and shall immediately take measures to organize rescue and report to higher-level government. In addition, governments at all levels have formulated emergency plans for disaster prevention and mitigation.

1.2 Gender awareness of policies of CC and DRR

1.2.1 Gender awareness of policies of CC

Some concerns for vulnerable groups and women have been expressed in planning documents, as well as in some laws and regulation-related documents of China's government. For instance, China's climate change adaptation strategy mentions the importance of focusing on adaptation efforts in vulnerable areas and among vulnerable groups, and it emphasizes strengthening special information services about extreme weather for vulnerable groups.

1.2.2 Gender awareness of policies of DRR

1.2.2.1 Gender indicators included in disaster statistics

Since 2004, in the Natural Disaster Statistics System, gender has been included as one of the indicators in the ledger of disaster-related deaths and missing persons. In 2014, the Statistical System of Large-scale Natural Disaster Losses was jointly issued by the Ministry of Civil Affairs, National Commission for Disaster Reduction and National Bureau of Statistics; it included women, the elderly (60 and over), children (14 and under), "sanwu" people (people without identification papers, a normal residence permit or a source of income) and "sangu" people (children, the elderly and the disabled without a source of income, labor capacity or a legal supporter) in the column of "people requiring transitional life relief" in the statistics of people affected by disasters. The Ministry of Civil Affairs disclosed the sex ratio of disaster-related deaths on the basis of those data in

2006 and 2009^{11,12}, showing that the number of male deaths in disasters is higher than that of female deaths. The number of young adults is also shown to be higher than that of older adults. Moreover, a study analyzing gender ratios based on the ledger data of 2011 and 2012 showed that the male-female ratio of disaster-related deaths was 1.7:1¹³.

1.2.2.2 Women's needs in storage and distribution of relief materials

Women's needs have been gradually taken into account in the process of the storage and distribution of relief materials at the local level. For example, a household first aid kit, containing more than 10 types of daily necessities, has been added to the relief materials of the Red Cross Society of China. This kit is continuously being improved. For example, products such as sanitary napkins have been included.

1.2.2.3 Concerns about emergency health responses to natural disasters

The National Health Contingency Plan for Natural Disasters (draft) notes that: "medical and health services focusing on groups/people in temporary shelters and floating populations should be reinforced. Medical and health services, as well as effective measures, should also be offered to people stranded in stations/wharfs/airports/roads and relief working conditions. In addition, medical and health services for special groups, such as pregnant and lactating women, elders, infants and the disabled need to be guaranteed."

1.3 Gender awareness in comprehensive and social welfare policies

Equality between men and women is part of the basic state policy of China. To promote the status of women and gender equality, China focuses on ensuring equal opportunities for participation in economic activities, employment and entrepreneurship. Between 2010 and 2015, small-sum guaranteed discount government loans of 222.062 billion RMB have been issued to help and encourage women to start their own businesses. Laws, regulations, plans

and other policies promoting women's participation in political issues have been formulated and implemented. The rate of women's participation in political issues has improved¹⁴.

Policies relating to gender awareness are reflected in comprehensive and social welfare policy documents. For example, all the Five-Year Plans for National Economic and Social Development have special sections on the rights and interests of disadvantaged

groups such as women, children, the elderly and the disabled. These are usually matched with corresponding specific women's development planning at the local level. In 1994, China's Agenda 21--White Paper on China's Population, Environment, and Development in the 21st Century was issued, and the 1995 Fourth World Conference on Women hosted by the UN was held in Beijing. Following these events, the Chinese government's efforts on behalf of disadvantaged people shifted from simple protection of their interests and rights to their development. Afterwards, the government continued to develop and execute a series of programs for the development of Chinese women: National Program for Women's Development 1995 - 2000, National Program for Women's Development 2001 - 2010 and National Program for Women's Development 2011 - 2020. In promoting equal rights for women, several achievements have been made.

1.3.1 Gender awareness in China's Twenty-first Century agenda

China's Agenda 21--White Paper (Document of State Council No. (1994) 37) made a comprehensive plan to protect the rights and interests of women and utilize the role of women. Actions were planned for giving women legal rights to equal opportunities in education and decision making to women, providing equal job opportunities to women to improve the economic level of women in rural areas, emphasizing women's nutritional requirements and health care, and encouraging women to participate in the protection, development and utilization of water/soil and other resources to ensure their participation in sustainable development. Furthermore, the Priority Project Plan of China's Agenda 21 aims to "enable rural women in five northwestern provinces to participate in capacity building for sustainable development" as the sixth priority project of "comprehensive capacity building". The Program for Action for Sustainable Development in China in the Early 21st Century (2003) places a renewed emphasis on strengthening disease prevention and healthcare for women and children.

1.3.2 Gender and climate change awareness in women's developments policies

Since the adoption of the Beijing Declaration and

Platform for Action at the 1995 Fourth World Conference on Women, to fulfill its international commitments, the Chinese government has continued to develop and execute a series of programs for women's development: the National Program for Women's Development 1995 - 2000, the National Program for Women's Development 2001 - 2010 and the National Program for Women's Development 2011 - 2020. Although in the two programs issued in 2001 and 2011, "climate change and disaster prevention and mitigation" were not explicitly mentioned, the former did set an objective and relevant measures under the sixth priority field "Women and Environment". The goal concerning the relationship between women and environment is to promote women's participation in environmental protection and decision-making. Furthermore, the latest National Program for Women's Development 2011-2020 continues to set "women and the environment" as one of its seven major topics and includes four major goals related to climate change. The four major goals include (i) fully reflect the principle of gender equality in policies related to the environment and development, culture and media, social management and family, etc.; (ii) solve drinking water problems in rural areas, reducing damage to women's health caused by water pollution; (iii) advocate for women's participation in energy conservation and low-carbon living; (iv) improve women's abilities to prevent and cope with disaster risks by fulfilling their special requirements in DRR.

1.3.3 Laws and regulations on protection of women's rights and interests

In 1992, the Women's Rights and Interests Protection Act was issued, mandating that "women enjoy equal political rights, cultural and educational rights, labor and social security rights, property rights and interests in marriage and family." The Electoral Law of the National People's Congress and Local People's Congresses at Various Levels stipulate, after being amended in 1995, that "the deputies to the National People's Congress and the local people's congresses at various levels shall have an appropriate number of women deputies, and gradually increase the proportion of women representatives". The Notice on Earnestly Safeguarding the Rights and Interests of

Rural Women’s Land Contracts (Central Office 2001, No.9) stipulates that “the rural land contract must be adhered to in order to ensure gender equality and to

not allow any discrimination against women.” Consequently, the rates of women’s participation in politics, education, employment, etc. have improved.

1.4 Summary

In the Chinese policy system, policies directly addressing climate change are technology- and engineering-based, and those related to DRR mainly focus on government-led reductions in vulnerabilities to disaster. China's Agenda 21--White Paper presented a comprehensive plan, citing protection of the rights and interests of women and the importance of

the role of women; it was therefore an important initial document in the field of coping with climate change. It remains irreplaceable today. Gender awareness of climate change is being gradually strengthened and improved in social welfare guarantee policies, specifically regarding women’s vulnerabilities.

¹⁰ The Third National Assessment Report, 2015

¹¹ Ministry of Civil Affairs, 2006

¹² China National Center for Disaster Reduction, 2009

¹³ Zhao Fei, et al., 2013

¹⁴ The State Council Information Office of P.R.C, 2015

2. Gender situation of relevant government departments addressing CC and DRR

2.1 Relevant officials' awareness of gender

At the Jiangsu and Qinghai pilot sites, 78 officials at provincial, municipal, county and local levels, as well as those from the Women's Federation, were interviewed. The ratio of men to women among the interviewees is 3:1, but in social management departments, such as Women's Federation, civil affairs and poverty alleviation, the interviewed officials are mainly women. Their key opinions and conclusions are as follows.

2.1.1 Opinion of interviewees on differences between men, women and their work

Interviewed officials generally believe that women can do the same work as men and that there is no overall difference between the work capacities of men and women. However, they also think gender differences should be taken into consideration in the execution of work. To be more specific, men take on heavier work burdens than women because they are inclined to be concerned about and to protect women.

According to the interviewed officials, women are less involved in some types of work, such as working on the sea for long periods of time, investigation or inspection in distant rural areas, operation of large machines, etc., all of which are mainly undertaken by men. Interviewed officials in relevant positions are mostly men and they state that the main reasons for this situation are as follows: (1) public toilets are lacking in fieldwork, which is less convenient for women than for men; (2) it is more difficult for women to work outside during a flood situation or when it is down pouring; (3) it is considered "brutal"

to ask a woman to inspect a slaughter in a rural area alone in the early morning and face a bloody and dirty situation; (4) it is particularly dusty when operating large machines and thus it is regarded "not considerate" to ask women to perform such a task; (5) women are perceived as weaker at driving and at some other technical operations.

2.1.2 Opinion of interviewees on the gendered differences of CC impacts

The interviewees generally think that there are no gender differences in how men and women are affected by climate change and disaster. Interviewees think that the negative effects mainly exist among the poor population, the elderly and weak, and the ill and disabled. The reasons for these opinions include the following: (1) Production activities are generally carried out in a single family unit. Although the left-behind farmers are mostly women, operation of agricultural machinery is basically a socialized service with governmental subsidies in Jiangsu Province and Qinghai Province; thus, there are no operational disadvantages for women. Additionally, in a busy farming season, migrant workers usually return home to lend a hand. (2) The size of the subsidy for a low-income family is counted based on the number of personnel in each family, without attention to gender, though poverty alleviation subsidies for low-income families are allocated to single family units. (3) In emergency cases, trained rescue personnel would be assigned to help transfer and resettle people who are relatively less able to move.

2.2 Female officials' status

2.2.1 Gender composition of government departments

Based on a small-sample random survey, the gender composition of officials in government departments related to climate change at the municipal and county levels has been collected and analyzed by our team. The results show (Table 2-1, Table 2-2) that, in the Jiangsu pilot, the proportion of female staff is highest in the Women's Federation and poverty alleviation departments, with a total of 47.32%. The next highest is the service management department of agriculture and forestry, with a total of 29.89%. The proportion of female staff is the lowest in the comprehensive coordination department, with a total of 17.14% women. Following the same trend, the percentage of female officials in departments of social management is the highest, and the

percentage in service management departments is the next highest, followed by the comprehensive coordination department.

In the Qinghai pilot, the proportion of female staff is the highest in the Women's Federation and poverty alleviation departments, with a total of 52.08%. The next highest proportion of women is in the business service management department of agriculture and forestry, with a total of 42.09%. The proportion of female staff is the lowest in the comprehensive coordination department, with a total of 38.26%. However, regarding high-level officials, the percentage of female officials in social management departments is the highest, and the percentage in the comprehensive coordination department is the next highest, followed by that in the service management departments.

Table 2-1 Percentage of Women in CC and DRR Relevant Departments of Some Counties in Jiangsu

	Percentage of Female Staff	Percentage of Middle-level Female Officials	Percentage of High-level Female Officials
Comprehensive coordination department	17.14	15.5	5.55
Service management department	29.89	16.1	16.78
Social management department	47.32	21.5	24.17

Table 2-2 Percentage of Women in CC and DRR Relevant Departments of Some Counties in Qinghai

	Percentage of Female Staff	Percentage of Middle-level Female Officials	Percentage of High-level Female Officials
Comprehensive coordination department	38.26	28.13	21.53
Service management department	42.09	27.96	14.05
Social management department	52.08	39.51	47.11

Generally, the proportion of middle-level and high-level female officials is lower than that of female staff. The gender composition is quite different from one department and region to another. In some

departments, the low proportion of female staff may be one of the reasons for the currently low ratio of female officials. In recent years, the number of female civil servants has shown a significant increase.

2.2.2 Gender differences in training opportunities for government officials

Among the 78 interviewed officials in Jiangsu and Qinghai provinces, the rate of interviewed officials who had ever received training about climate change is very low, only 33.4% and 23.5%, respectively. In contrast, the percentage of interviewed officials who had ever participated in training about disaster reduction is much higher, approximately 52.9% in Jiangsu and 50.0% in Qinghai.

In Jiangsu Province, the proportion of male officials who have ever attended training about climate change (27.3%) is approximately 10 percentage points higher than that of female officials (16.7%). In addition, the proportion of male officials (63.6%) who have ever attended trainings about disaster reduction is approximately 30 percentage points

higher than female officials (33.3%).

In Qinghai Province, the proportion of male officials who have ever attended trainings about climate change (33.3%) is approximately 10 percentage points lower than that of female officials (42.9%), and the proportion of male officials (55.2%) who have ever attended trainings about disaster reduction is approximately 27 percentage points higher than female officials (28.6%).

Regarding interviewees' self-reported need for training, in Jiangsu Province, the need for training related to the professional skills of male officials (64.5%) is 2 times that of females (33.3%). In Qinghai Province, needs for training related to the professional skills of male and female officials are 29.0% and 28.6%, respectively.

2.3 The role of the Women's Federation

Through interviews, it can be determined that, as the main women's organization, the Women's Federation plays an irreplaceable role in improving the status of women and in the elimination of gender discrimination. It shows concern for women as a vulnerable group by carrying out the following types of projects: (i) increasing support and relief efforts, establishing grass-roots relief mechanisms for poor women and carrying out 1+1 poverty alleviation and other relief activities; (ii) using policy's leverage and using the development of individual economic undertakings as a method to help women to engage in entrepreneurial microfinance work and broaden their access to

wealth and training to improve their livelihoods; (iii) emphasizing the health care and pension insurance of unemployed women and children and conducting research on women's diseases to improve the health status of women; (iv) eliminating gender discrimination and improving the social status of women through publicity and education; (v) relying on national preferential policies to provide livelihood grants, school aid and other necessary economic subsidies to children from poor families to reduce the burden of poor women relying on the nation's policies.

2.4 Summary

From the interviews, it appears that the officials have certain gendered perceptions regarding positions and labor divisions, but do not deny women's capacity. Based on a small-sample random survey, the proportion of female staff and officials is noticeably low in the Comprehensive Coordination Department. Overall, the proportion of female managers is lower than that of female staff. In recent years, the

proportion of women civil servants in the relevant agencies has been gradually increasing, but it takes time for these women to be promoted to leading positions. In addition, although the Women's Federation is not a government department, as an official women's organization, it plays an irreplaceable role in improving the status of women and in the elimination of gender discrimination.

3. The role of NGOs in coping with the gender dimensions of CC and DRR

To understand the roles and functions of NGOs and grassroots organizations in responding to climate change, interviews were conducted with six NGOs chosen from those working on climate change issues

in China, including three international organizations and three domestic ones. The interviewees included five women and one man.

3.1 NGOs' activities in coping with CC and DRR

3.1.1 International NGOs' work in China

In coping with CC, international NGOs track the United Nations Climate Change Conference and multilateral climate change conferences, partnership dialogue meetings, side events, etc., to match intergovernmental negotiations.

Regarding aid for natural disasters, Oxfam has been engaged in poverty alleviation and development, as well as disaster prevention and relief work, since 1987, and has paid particular attention to the needs of women and disadvantaged groups. After the Wenchuan earthquake in 2008, Oxfam rolled out a 5-year post-disaster relief and rebuilding project in the county, with a focus on creating sustainable livelihoods for the victims, supporting minority groups and women, and training local NGOs to learn from the rebuilding experience and policy advocacy. Oxfam is also dedicated to combining climate change adaptation measures with community development, enhancing the capacity of communities to address disasters and providing various training in rural areas, such as Shaanxi and other provinces. The number of beneficiaries is above 12.5 million.

It is worth noting that Oxfam China project established a specialized gender project team in 2004. Series of projects have been carried out in Beijing, Guangzhou, Henan, Hebei, Guangxi, Yunnan,

Shaanxi, Gansu and other places. Related training, community work, public education, policy research and advocacy work was conducted in cooperation with government agencies, research institutions, women / gender organizations and grassroots organizations.

3.1.2 Domestic NGOs' work

Organizations such as Green Homes have been paying attention to the influence of climate change on China's rivers since 1998, recording the impacts through a series of activities and using their media expertise to create public awareness.

Green Stone is devoted to promoting communication and understanding among enterprises, government and community. Green Stone has launched a project called "Green Neighborhood" to help enterprises be environmentally sustainable by customizing measures for enterprises wishing to improve their pollution discharge and creating platforms for communication. Green Stone also tracks regular patterns of pollution discharge and compares them with the data published by enterprises themselves. Thus, Green Stone can ensure the integrity and authenticity of the information disclosed by enterprises.

Table 3-1 Main activities undertaken by interviewed NGOs

	Climate change negotiation	Disaster aid	Project research	Pilot projects	Monitor/Communication	Advocacy/publicity/training
Oxfam	Track	Provide relief materials; promote post-disaster rebuilding projects	Rural development and disaster management; social, gender, etc.	Pilot communities for climate change adaptation and poverty alleviation		Capacity building training (community)
Greenpeace	Track		Climate and energy projects (renewable energy)			
Natural Resources Defense Council			Climate and energy (policy)			Capacity building training
Green Earth						Environmental journalism investigations; Ten-year River Project etc.
Green Stone					Monitor polluting enterprises/ set up communication platform for government, enterprise and community	Publicity / training for environmental protection
Friends of Green Environment, Jiangsu						Advocate sustainable consumption; publicity / training for environmental protection

3.1.3 Communication with government authorities

The method used by the interviewed NGOs and grassroots organizations to communicate with government authorities is generally that of reports. They conduct research, and then submit their study reports proactively to the government to note the problems they have found.

Project research and pilot studies are the most effective way for NGOs and grassroots organizations to participate in government activities. For example,

when the Natural Resources Defense Council conducted the “National Plan and Policy Study for Control of Total Coal Consumption”, government officials were invited as policy consultants, and thus the communication was face to face. However, this type of communication is rare. Oxfam has cooperated with local governments through pilot studies. They provided funds, technology, trainings and other support to local governments, taking charge of the whole-process instruction, design and implementation of program activities.

Table 3-2 Examples of cooperation with government authorities

	Main authorities in cooperation	Government activities involved
Oxfam	National Development and Reform Commission	Climate change-related publicity
	Local government, poverty alleviation authorities	China's climate change adaptation policy projects
Greenpeace	Emphasizes independence and has no direct cooperation with the government. Focuses on communication & feedback and information exchange & sharing.	
Natural Resources Defense Council	National Development and Reform Commission, Ministry of Industry and Information Technology, Ministry of Housing and Urban-Rural Development, Ministry of Environmental Protection, etc.	Project cooperation
Green Earth	Mainly cooperates with news media	
Green Stone	Environmental protection authorities of Jiangsu province	Report environmental protection information to the public
Friends of Green Environment, Jiangsu	Environmental protection authorities of Jiangsu province	Conduct projects

Table 3-3 Examples of communication and exchange mechanisms with government authorities

	Project research	Pilot project	Report	Accusation	Letters & visits	Administrative reconsideration	Communication platform
Oxfam	Independent / collaborative research	Lead pilot projects (guided by government departments)	√				
Greenpeace	Independent research		√	√	√	√	
Natural Resources Defense Council	Lead research (guided by government)		√				
Green Earth	Mainly cooperate with news media						
Green Stone			√				√
Friends of Green Environment, Jiangsu	√						

3.2 Difficulties NGOs encountered in conducting activities

Difficulties faced by interviewed NGOs when carrying out activities are as follows.

- (i) International NGOs faced difficulties with registration, which makes it difficult for them to conduct activities in China;
- (ii) It is very difficult to change some local governments' conceptions, which is the main obstacle for NGOs trying to promote new ideas during the implementation of cooperative projects;

- (iii) Misunderstandings and bad impressions among the government, enterprises and communities create challenges for NGOs in carrying out their coordination and communication work;
- (iv) Financial problems are a major obstacle faced by local NGOs. In the meantime, to maintain their independence, they cannot receive funds from government or enterprises, and private charities' support for local NGOs is not sufficient.

3.3 Experiences of interviewed NGOs in conducting activities

During their activities focused on coping with climate change and disaster reduction, interviewed NGOs have accumulated a wealth of experiences, from which much can be learned.

- (i) By promoting and carrying out cooperation projects together with grassroots communities, NGOs can bring new ideas and technologies to local areas;
- (ii) Before starting community projects and disaster relief work, meetings to evaluate villagers' needs should be conducted for men and women separately to fully understand the special and real needs of vulnerable groups;
- (iii) Providing specialized training services for women can increase local women's participation in political

issues, as well as their effectiveness.

- (iv) Carrying out large-scale advocacy events can help the media understand the project area, and help residents living in project areas understand the purpose of the project.
- (v) NGOs at international or national levels cooperate with local NGOs or grassroots organizations when carrying out local activities. This can promote local organizations' growth, and improve the effectiveness of their activities.
- (vi) Setting up a specialized team for communication can help liaise with the government;
- (vii) Steadily promoting NGOs' abilities and influence by building a Model of Community Cooperation can extend the model's reach.

3.4 Summary

Regarding climate change and disaster reduction work, international NGOs lay emphasis on 1) on-site investigation before carrying out activities, and conduct activities at community level based on

project; 2) collaborating with local NGOs and grassroots organizations. China's local NGOs should devote more efforts to work in climate change and gender mainstreaming issues.

4. Gendered vulnerabilities in village communities coping with CC and DRR

This section of the report identifies populations in the pilot sites vulnerable to climate change and disasters by investigating respondents' gender roles; access to resources, information, training and decision-making; recovery capabilities and risk conceptions, individuals' sensitivities; disasters'

impacts and etc. The analysis is based on 3,402 valid samples which were collected via questionnaire survey across eight counties and 196 villages in Jiangsu Nantong, Qinghai Xining and Shaanxi Baoji. For more information on the survey, the respondents and the pilot sites, see appendix 2 and 3.

4.1 Identification of vulnerable groups

4.1.1 Vulnerable groups from the respondents' viewpoint

Most of the respondents, including women

themselves, think the elderly and children are vulnerable groups but that women are not (Fig. 4-1).

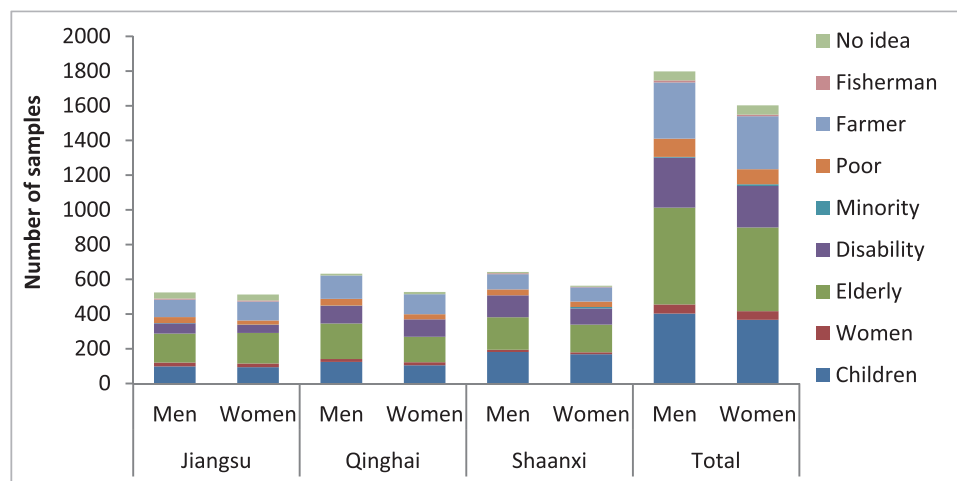


Fig. 4-1 Respondents' perceptions of who is vulnerable when disasters occur

4.1.2 Vulnerable groups based on impacts on livelihoods

More than half of respondents think climate change has not affected their labor input with regard to agricultural production (Fig. 4-2). As a whole, the proportion of women (23%) who think they spent more time doing labor due to climate change is

slightly higher than that of men (22%). The proportion of women (22%) who think they spent less time doing labor due to climate change is slightly lower than that of men (23%). Therefore, in terms of labor input affected by climate change, females are slightly more vulnerable than males, but not significantly.

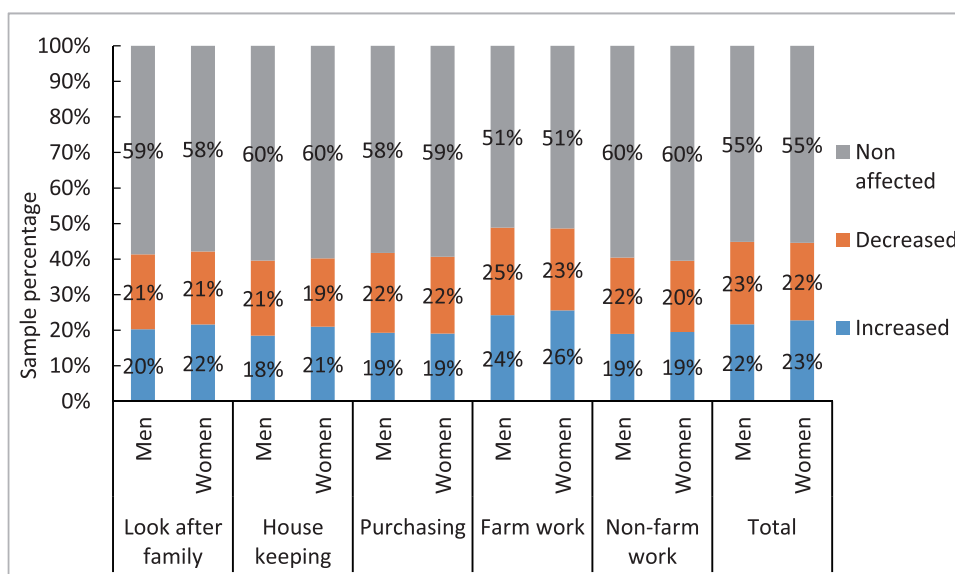


Fig. 4- 2 Impact of climate change and disaster on labor time

In addition to the impact of climate change on labor time, we also examined agricultural yield reduction due to disasters. Yield reduction refers to the percentage by which yield was reduced due to disaster. Correlation analysis was performed between the yield reduction ratio and households' gender composition of laborers, household income and age. The result shows that there is no significant correlation between yield damage ratio and the

gender composition of labor. However, there is a significant correlation of yield damage ratio with age and income (Table 4-1). Young and poor families appeared more vulnerable. Among those relatively more vulnerable groups, i.e., farm families (Fig. 4-3), young families (Fig. 4-4), and poor families (Fig. 4-5), families that rely more on female labor are likely to suffer more serious damages.

Table 4-1 Correlation analysis of respondents' agricultural yields loss ratio ($\alpha=0.05$)

Causes	Jiangsu	Qinghai	Shaanxi	All
Age	0.024*	0.800	0.371	0.000**
Income	0.227	0.00***	0.064	0.000**
Laborers' gender composition	0.856	0.070	0.614	0.068

Note: * ($p<0.05$) significant; ** ($p<0.01$) highly significant.

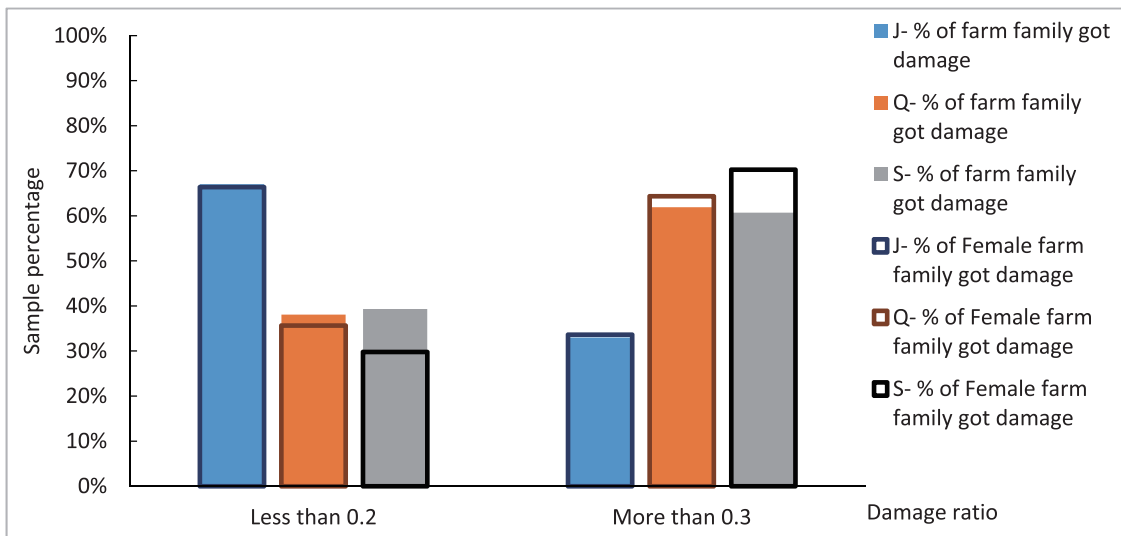


Fig. 4-3 Percentage of samples that experienced yield damage among general farm families VS female farm families

Note: Farm family: the respondents' family's first and second source of income is agriculture, Jiangsu 573, Qinghai 798, Shaanxi 865; Female farm family: the farm family has more than 50% female farmers, Jiangsu 226, Qinghai 101, Shaanxi 225; Damage ratio below 0.2: respondents' agricultural yield damage is less than 0.2, including those who did not experience yield reduction. J stands for Jiangsu, Q for Qinghai and S for Shaanxi.

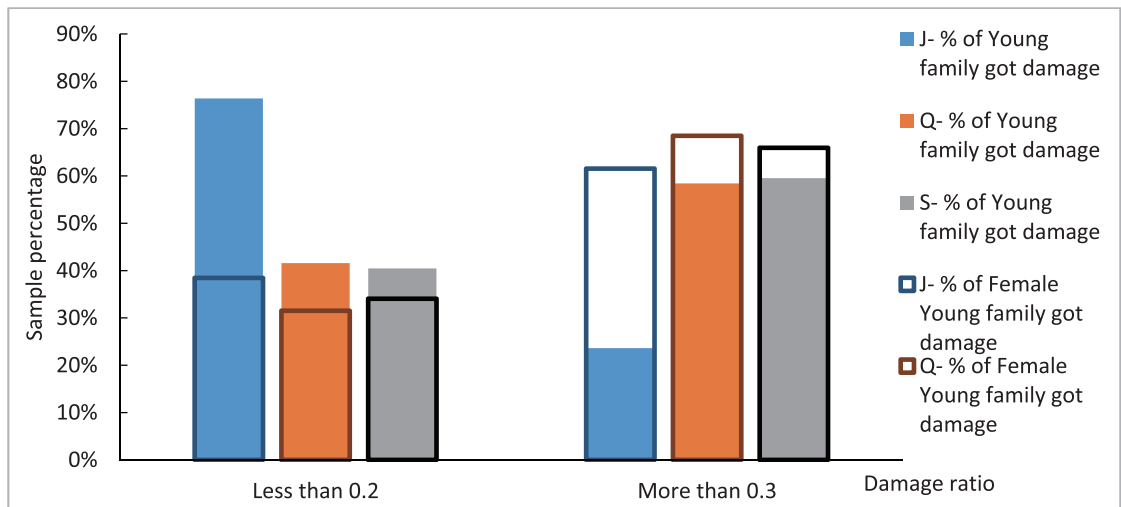


Fig. 4-4 Percentage of samples that experienced yield damage among general young families VS female young families

Note: Young family: the respondents are younger than 50 years old, Jiangsu 377, Qinghai 719, Shaanxi 1169; Female young family: the young family has more than 50% female farmers, Jiangsu 156, Qinghai 92, Shaanxi 329; Damage ratio below 0.2: respondents' agricultural yield damage is less than 0.2, including those who did not experience yield reduction. J stands for Jiangsu, Q for Qinghai and S for Shaanxi.

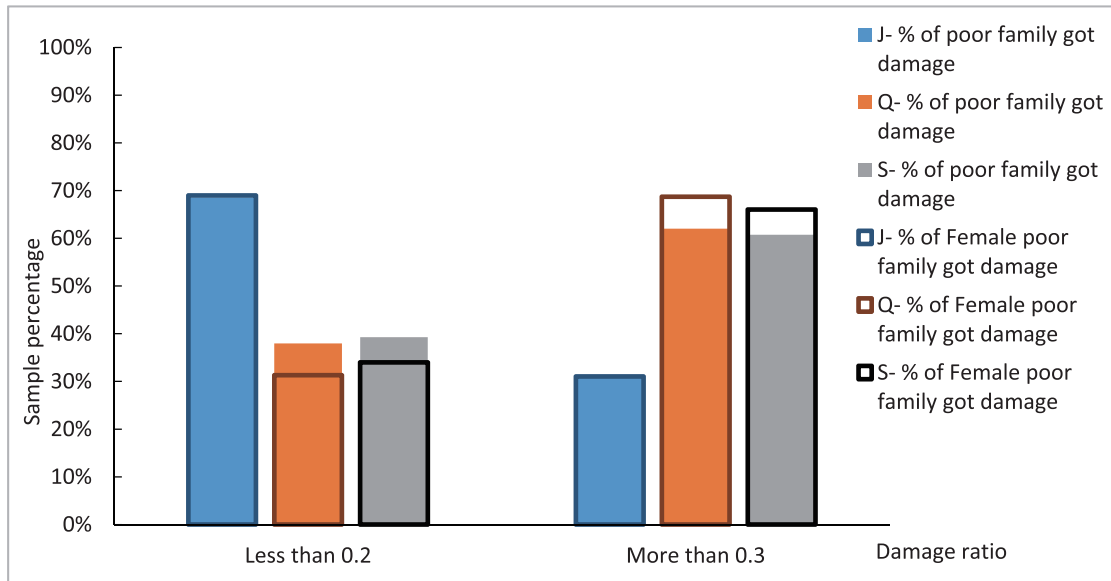


Fig. 4-5 Percentage of samples that experienced yield damage among general poor families VS female poor families

Note: Poor family: the respondents’ family income is lower than their pilot site’s average level, Jiangsu 665, Qinghai 503, Shaanxi 466; Female poor family: the poor family has more than 50% female farmers, Jiangsu 261, Qinghai 115, Shaanxi 156; Damage ratio less than 0.2: respondents’ agricultural yield damage is below 0.2 including those who did not experience yield reduction. J stands for Jiangsu, Q for Qinghai and S for Shaanxi.

4.1.3 Gendered differences in vulnerability factors

Considering various vulnerability factors such as social roles, and access to resources and information, women are more vulnerable to climate change and disasters than men, as will be explained below.

4.1.3.1 Gendered labor division

In terms of gender roles, women have been undertaking more household duties. The survey

showed that the sample size of respondents in which mainly the wife does “cleaning and cooking” is 19 times the size of the sample in which the husband does these chores. The sample size of respondents in which mainly the wife does “washing” and “care-giving” is 11 times the size of the sample in which the husband does these chores. (Fig. 4-6).

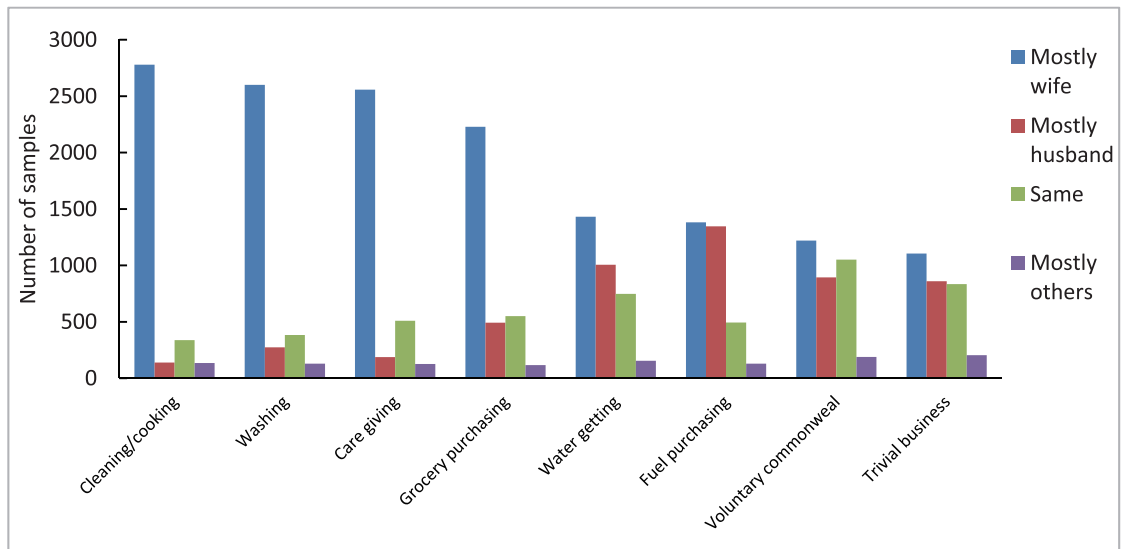


Fig. 4-6 The distribution of household duties undertaken by the respondents' family members

Although women appear to do more household work, they do not take on substantially fewer production activities than men. The sample size of respondents in whose family mainly the

husband does farm work is only 2.86 times that in which mainly the wife does, and 1.95 times that in which the two share the same burden (Fig. 4-7).

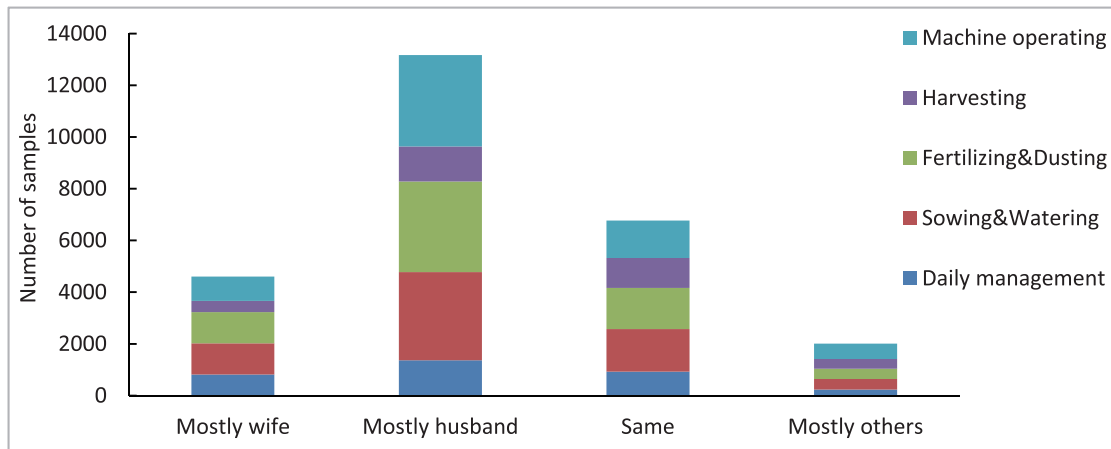


Fig. 4-7 The distribution of agricultural work undertaken by the respondents' family members

Note: Five groups of samples are piled up, therefore the maximum sample size on the y axis is five times more.

The survey data revealed that women, being occupied by household work, were partly constrained to non-farm employment (Fig. 4-8a) and, as will be shown later, from participating in disaster emergency

plans. The proportion of women who stay behind at home instead of engaging in off-farm employment is higher than that of men (Fig. 4-8b).

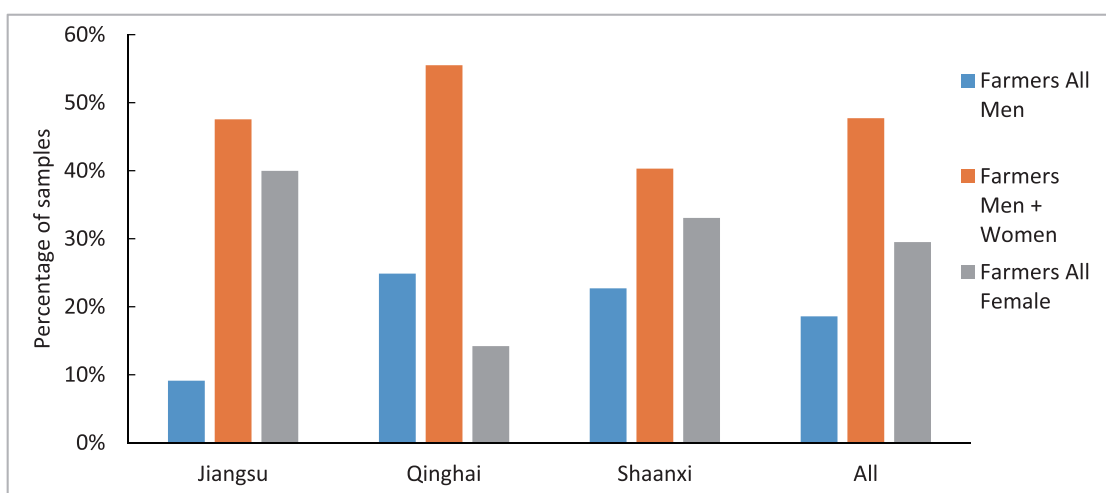
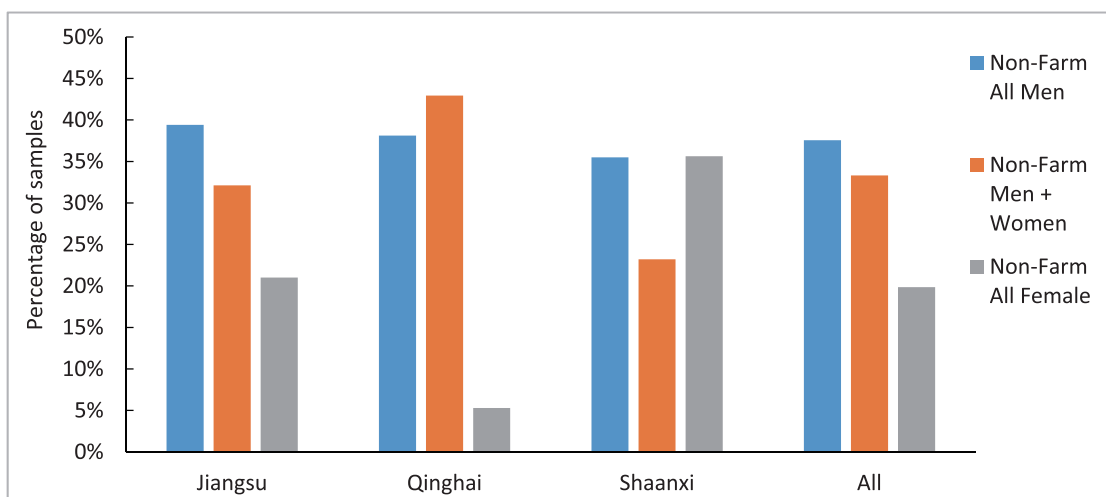


Fig. 4-8 Gender compositions of households' farm and non-farm workers

Note: a) Gender composition of non-farm workers, sample size: Jiangsu 576, Qinghai 850, Shaanxi 741; "Non-Farm All Men" means that in the respondents' family the non-farm employees are all men; "Non-Farm Men + Women" means that in the respondents' family, both men and women are non-farm employees; "Non-Farm All Women" means that in the respondents' family the non-farm employees are all women;

b) Gender composition of farmers, sample size: Jiangsu 1,041, Qinghai 937, Shaanxi 965; "Farmers All Men" means that in the respondents' family all farmers are men; "Farmers Men + Women" means that in the respondents' family, both men and women are farmers; "Farmers All Women" means that in the respondents' family all farmers are women.

Women earn less than men. Approximately 58% of women and 37% of men earn less than 10,000 yuan per year. Correspondingly, 42% of women and 63%

of men earn more than 10,000 yuan per year (Fig. 4-9).

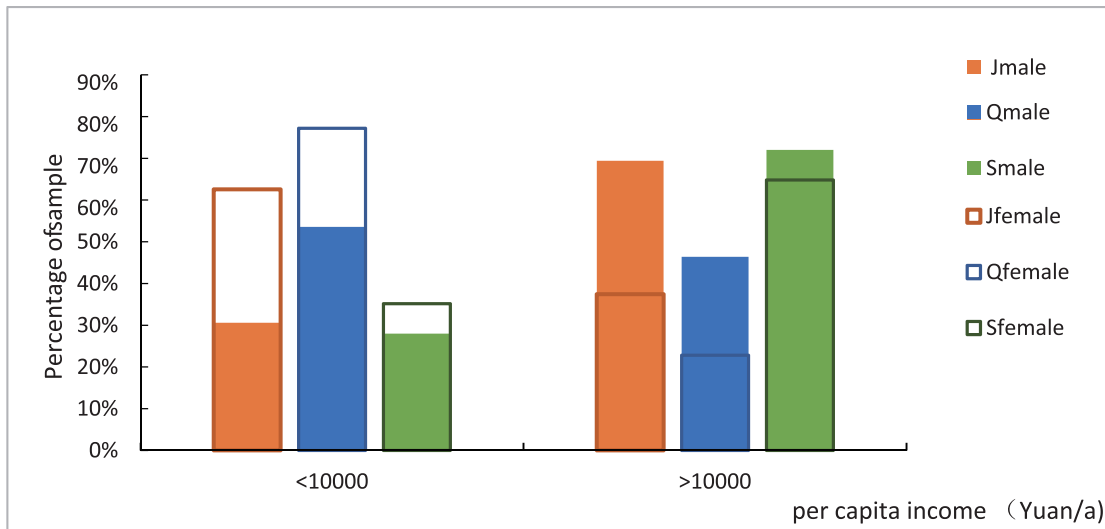


Fig. 4-9 Gender comparison at different income levels

Note: Jfemale/ Qfemale/ Sfemle refer to females in Jiangsu, Qinghai and Shaanxi; Jmale/Qmale/Smale refer to males in Jiangsu, Qinghai and Shaanxi.

4.1.3.2 Access to resources

Apart from the division of labor that directly impacts women’s incomes, from the perspective of obtaining resources, females’ access to natural, social, physical, financial and human capital is also constrained by traditional gender roles, education levels and traditional marriage customs. Women experience the following main disadvantages:

1) Land allocation

Due to the traditional marriage customs, women have less land in their names than men (Fig. 4-10). For example, in Jiangsu province, approximately 24% of women and 57% of men have more than 30% of their household’s land in their names. In Qinghai, it is 23% and 46% correspondingly.

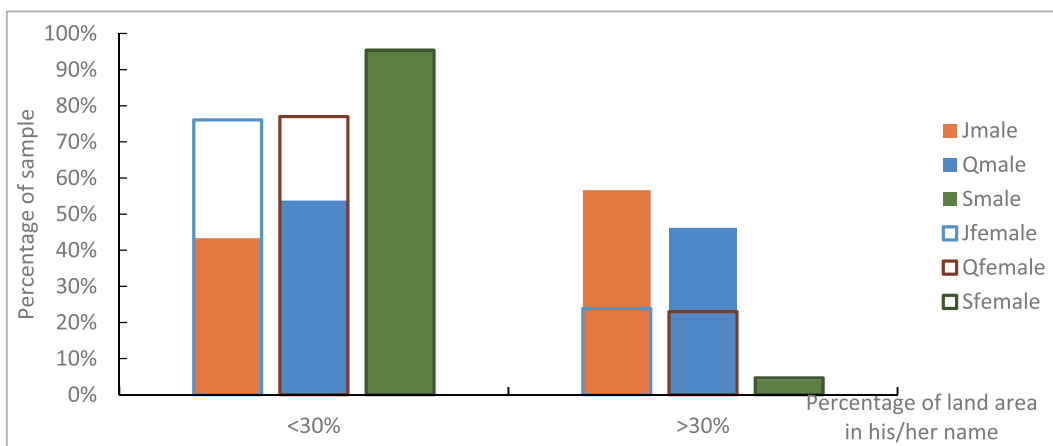


Fig. 4-10 Gendered difference in land allocation in pilot sites’ households

Note: Sample size: Jiangsu males 459; Jiangsu females 406; Qinghai males 599; Qinghai females 500; Shaanxi males 642; Shaanxi females 561. Gendered difference significance test (t test), Jiangsu, $p < 0.01$, Qinghai $p < 0.01$, Shaanxi $p > 0.1$.

2) Loan qualification

The proportion of women with loan qualifications is significantly lower than that of men. More specific

ly, the proportion of women who have loan qualifications is 77 percentage points lower than that of men (Fig. 4-11).

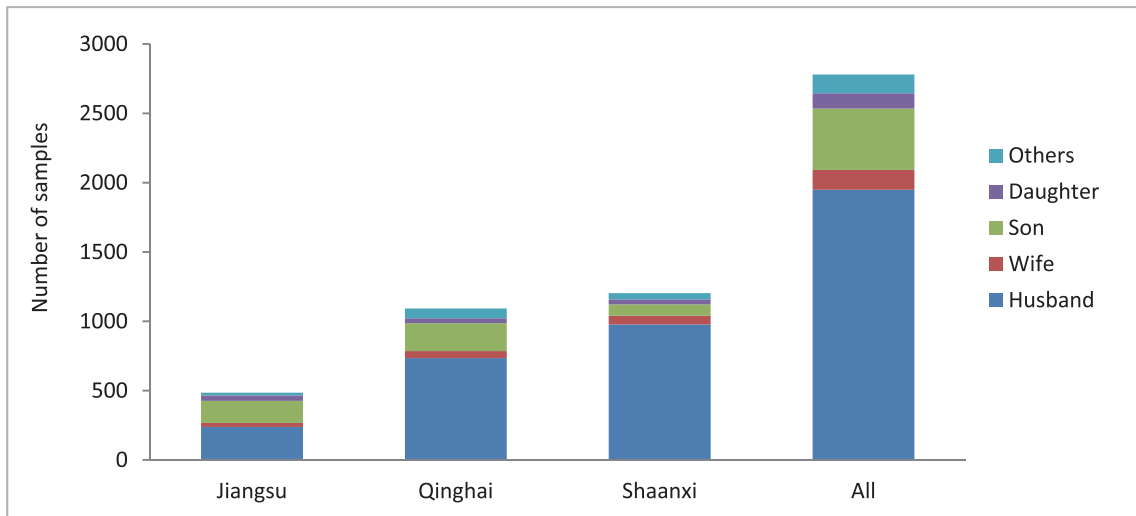


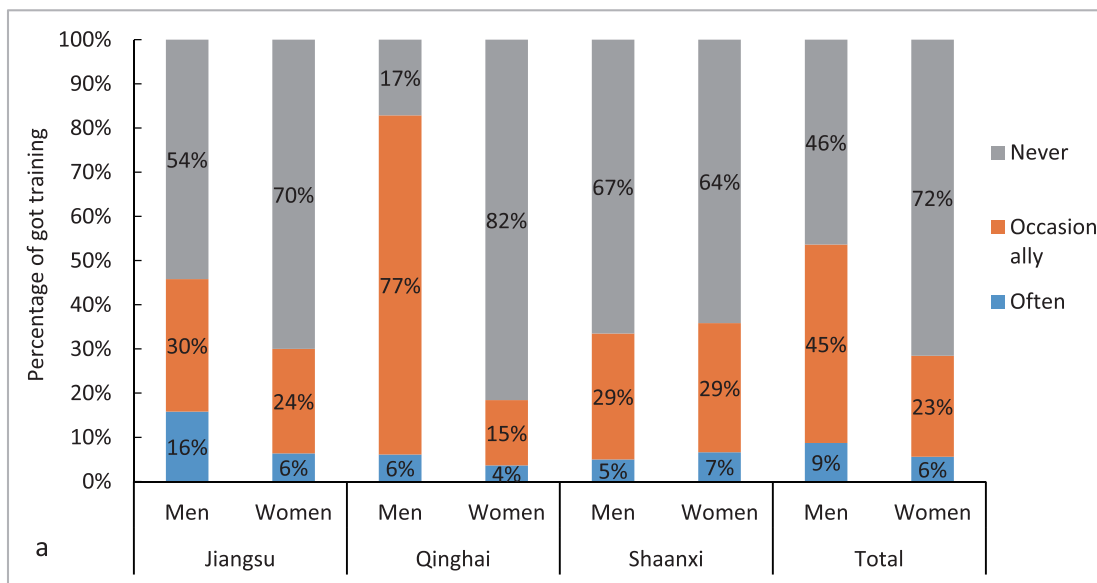
Fig. 4-11 Eligibility of loan application in a household

3) Access to training

Women take on more family duties (Fig. 4-6), which prevents them from utilizing relevant training opportunities (Fig. 4-12a). In Shaanxi and Jiangsu, the proportion of women who report “no time, need to take care family” as the reason for not attending training is significantly higher than the proportion of

men who say the same (Fig. 4-12b).

Overall, 9% of men and 6% of women have taken part in training ‘often’, and 45% of men and only 23% of women have taken part in training ‘occasionally’; 72% of women have never attended a training, while the corresponding % for men is 46. (Fig. 4-12a).



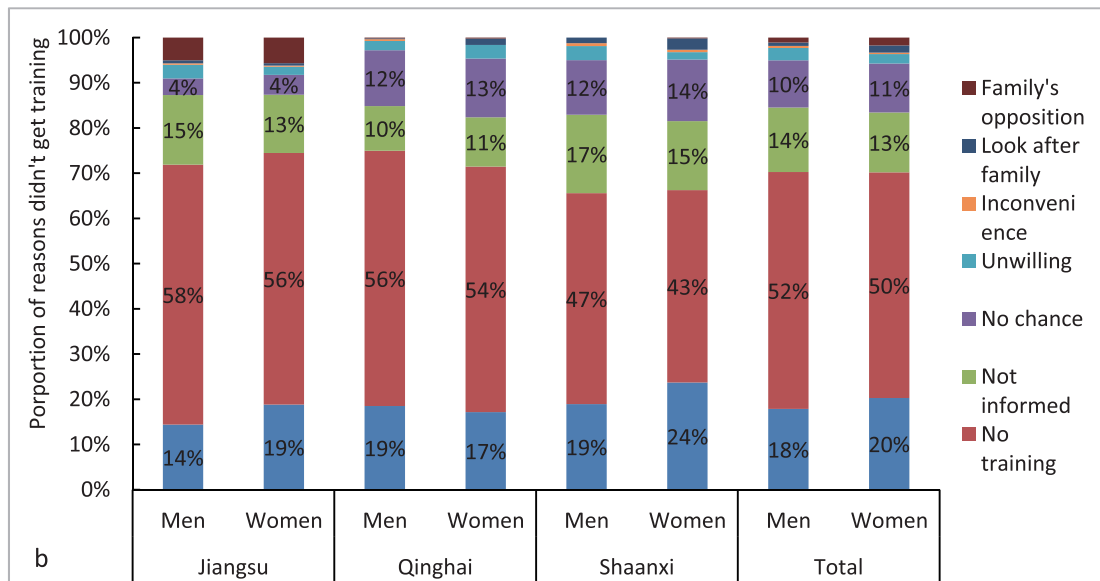


Fig. 4-12 Proportion of respondents who obtained training at different frequencies (a) and the reason they did not obtain training (b)

Note: Sample size: Jiangsu men 299, women 388; Qinghai men 535, women 431; Shaanxi men 639, women 557.

4) Access to information

The proportion of women who obtain social capital,

such as early warnings and forecast information (Fig. 4-13), is lower than that of men.

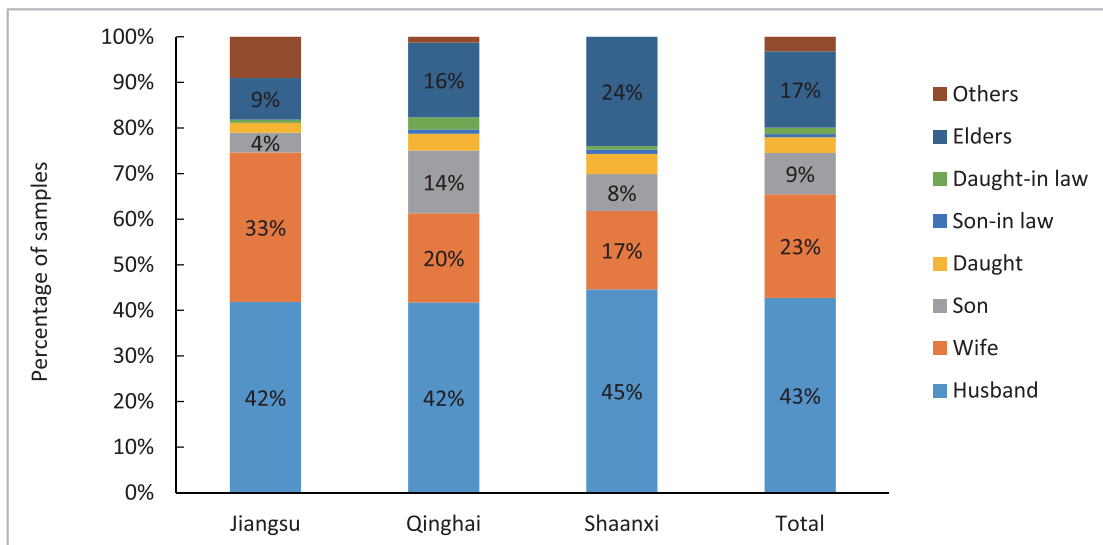


Fig. 4-13 Family members who often receive forecast information

There are significant gendered differences in terms of understanding the disaster prevention and mitigation facilities in one's community. Male respondents give

clearer answers to whether there are such facilities (Fig. 4-14).

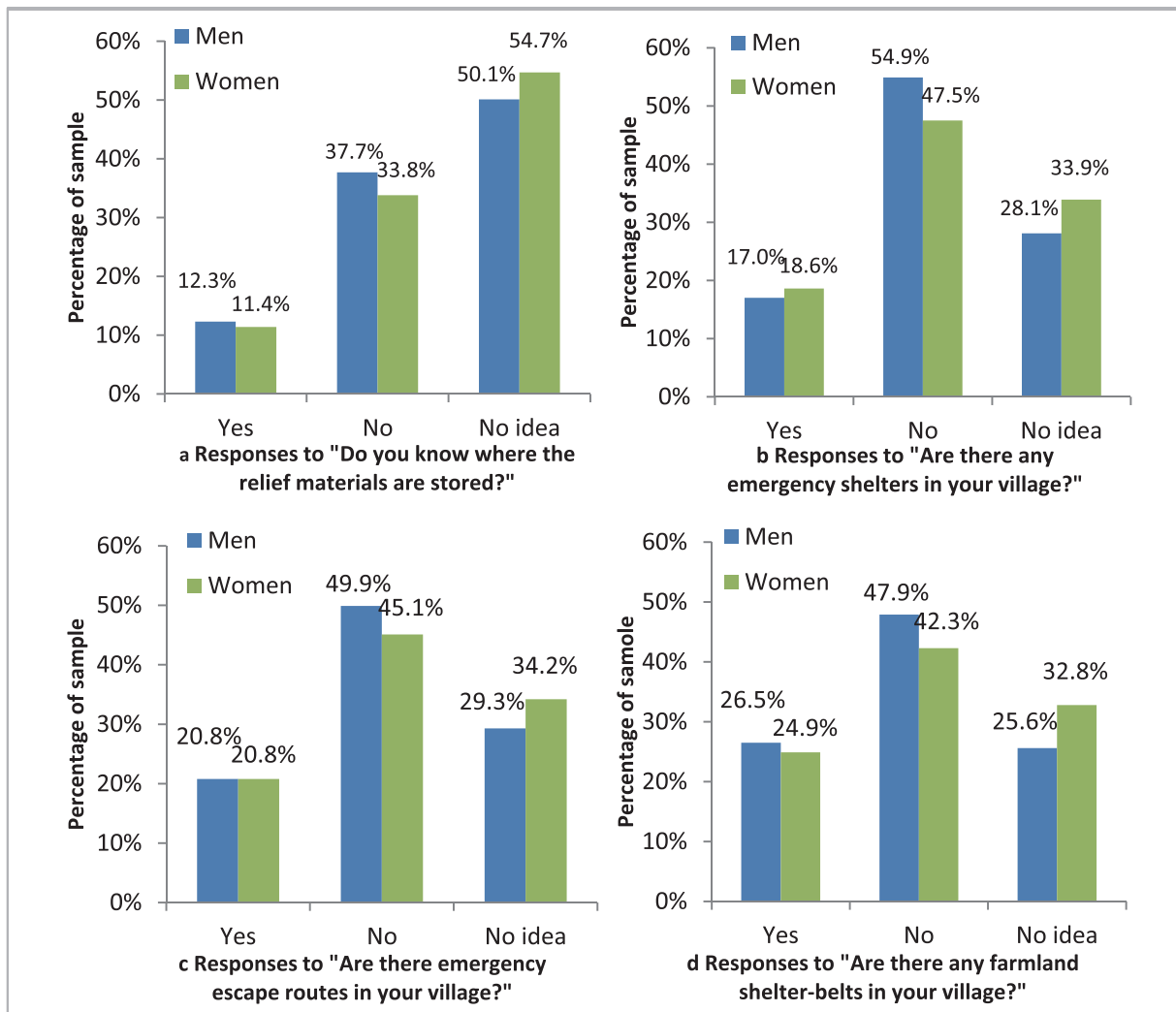


Fig. 4-14 Respondents' knowledge of disaster prevention and mitigation facilities in the three pilot sites

Note: Sample size: Jiangsu men 550, women 550; Qinghai men 593, women 498; Shaanxi men 642, women 561.

Specifically, the proportions of male and female respondents who know about their community's

emergency plan are 25% and 20%, respectively (Fig. 4-15).

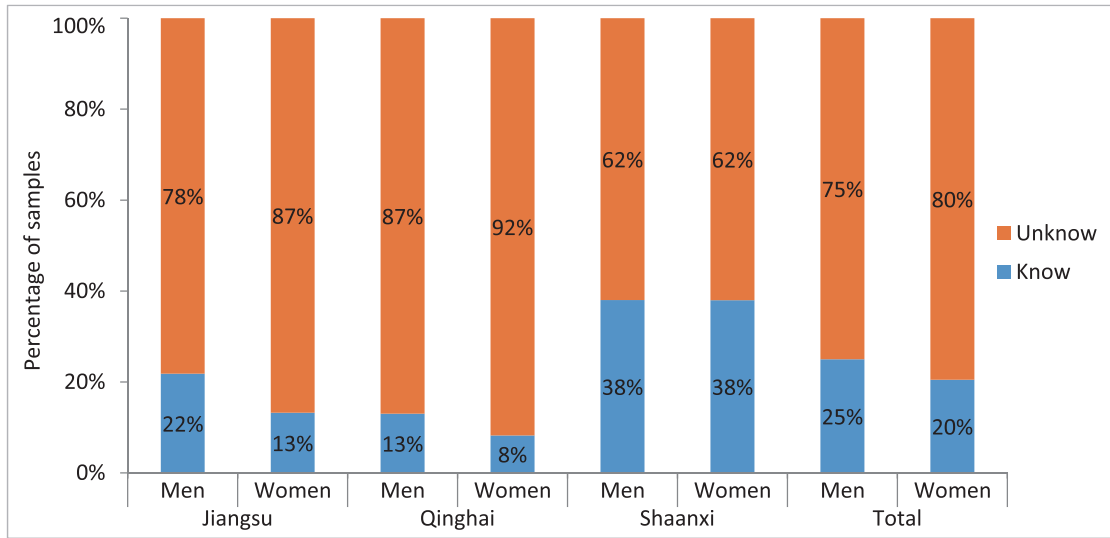


Fig. 4-15 Respondents' awareness of the disaster emergency plan

Note: Sample size: Jianguo men 550, women 550; Qinghai men 553, women 473; Shaanxi men 642, women 561.

In all provinces, more men than women had participated in making disaster emergency plans (Fig. 4-16).

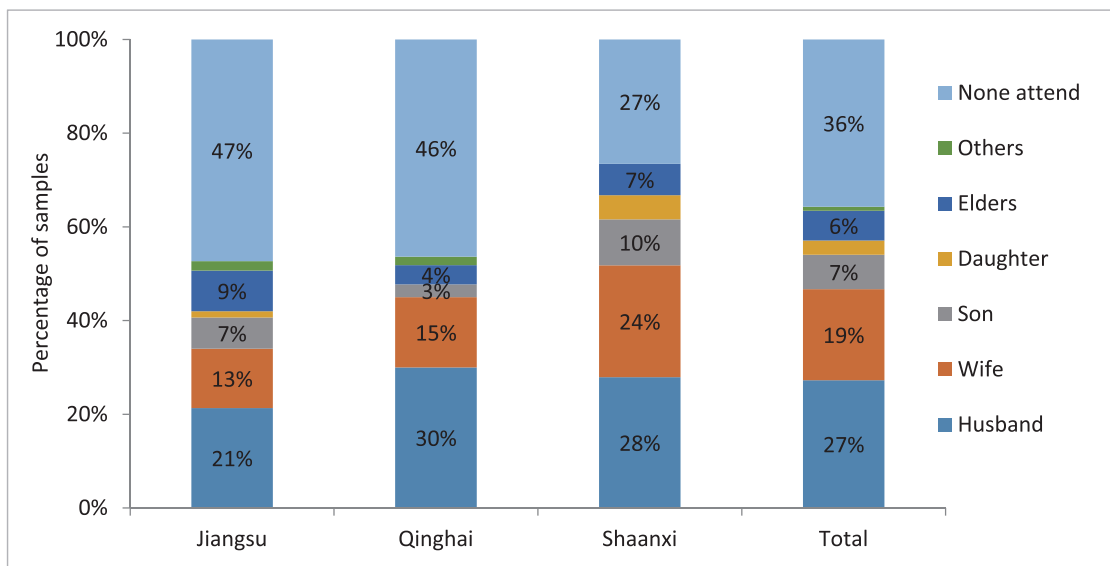


Fig. 4-16 Household members' participation in disaster emergency plan making

Note: Sample size, Jianguo, men 84, women 66; Qinghai, men 128, women 92; Shaanxi, men 240, women 208.

4.1.3.3 Confidence in coping ability

Regarding ability to recover, the proportion of women who think they have no ability to cope with disasters is higher than that of men (Fig. 4-17).

Facing an impending disaster, the proportion of women who would choose to rescue themselves is lower than that of men (Fig. 4-18).

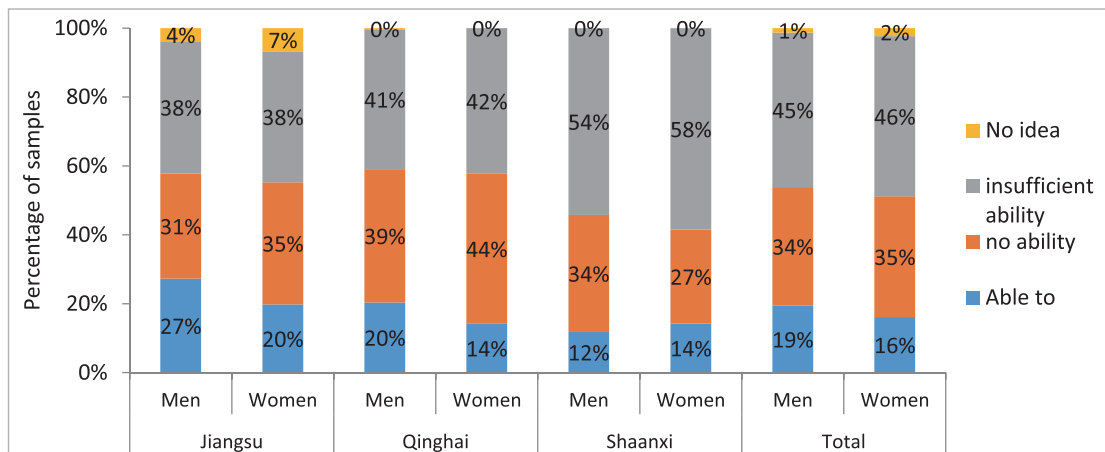


Fig. 4- 17 Respondents' evaluation of their ability to cope with local disasters

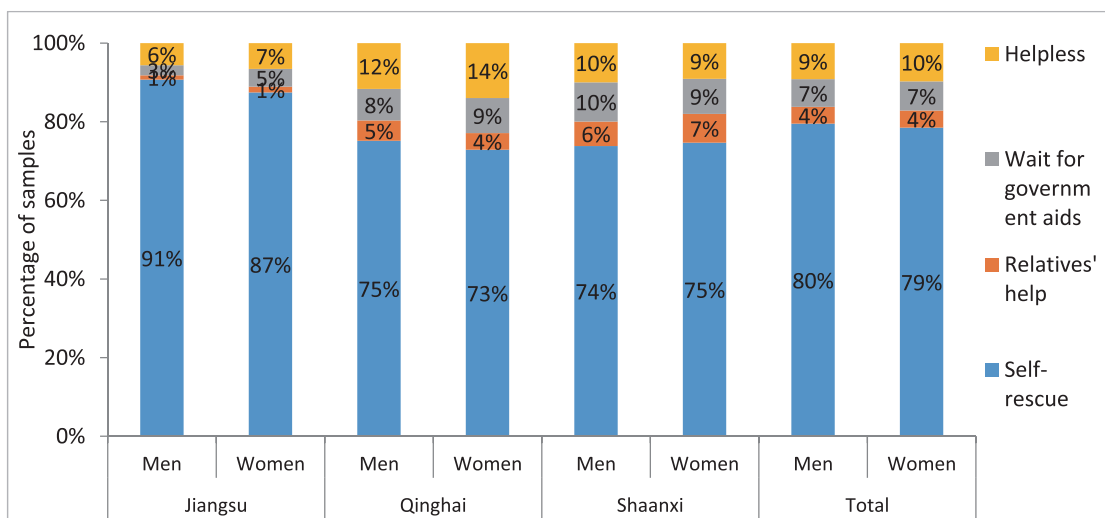


Fig. 4- 18 Respondents' attitude when disaster occurs

Note: Sample size: Jiangsu men 550, women 550; Qinghai men 584, women 494; Shaanxi men 642, women 561.

4.2 Gendered differences in participation in family and public affairs

As shown above, women have been undertaking more household duties than men. However, they have less power and autonomy in decision-making, as well as less confidence in expressing their views regarding family and community public affairs, as will be shown below.

4.2.1 Women's decision-making power

In terms of family decision-making, women have fewer rights than men in all cases other than daily expenses (Fig. 4-19). This might cause women's needs and wishes to be ignored.

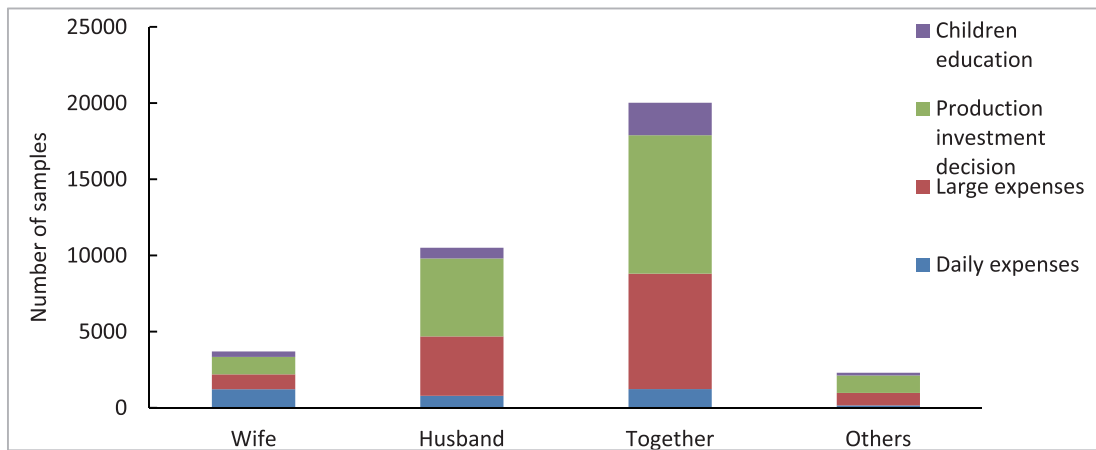


Fig. 4-19 Decision making authorities in the respondents' daily family affairs

When villagers' congresses or other community meetings are held, the proportion of husbands participating in the meeting is higher than that of wives by 38 percentage points (Fig. 4-20). Therefore,

women might know less about public affairs than men, which might weaken their ability to contribute their suggestions in meetings.

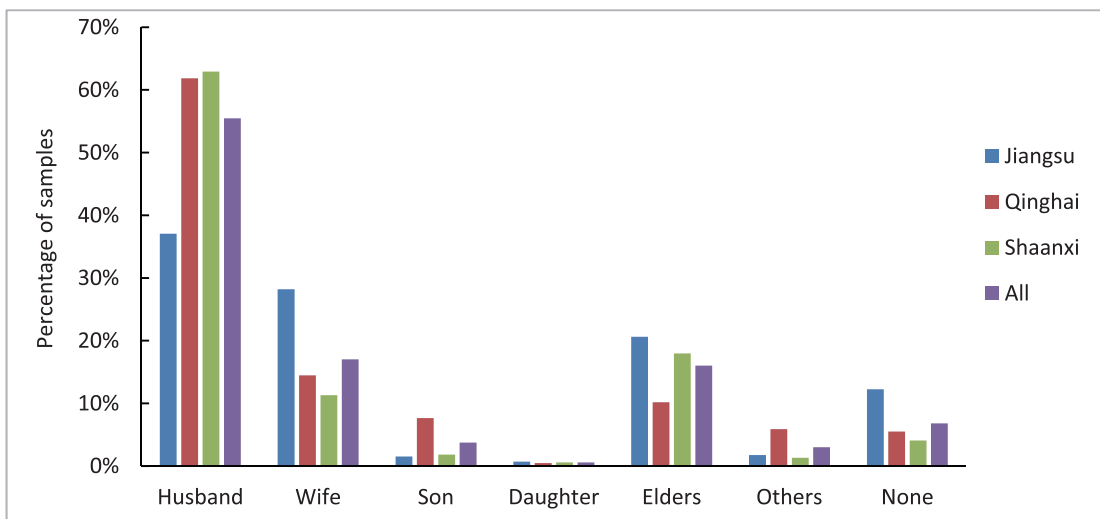


Fig. 4-20 The proportion of the respondents' family members attending villager congresses

Note: Sample size: Jiangsu 858; Qinghai 1,072; Shaanxi 1,203.

4.2.2 Women's autonomy in decision-making

When respondents vote on village affairs, the proportion of women who can make independent decisions is 11 percentage points lower than that of men; the proportion reporting that they should consult their family or that their family decides for

them is higher than that of men (Fig. 4-21). This lower degree of autonomy prevents women from expressing their own real needs and causes them to lose confidence gradually, which may cause further inequalities.

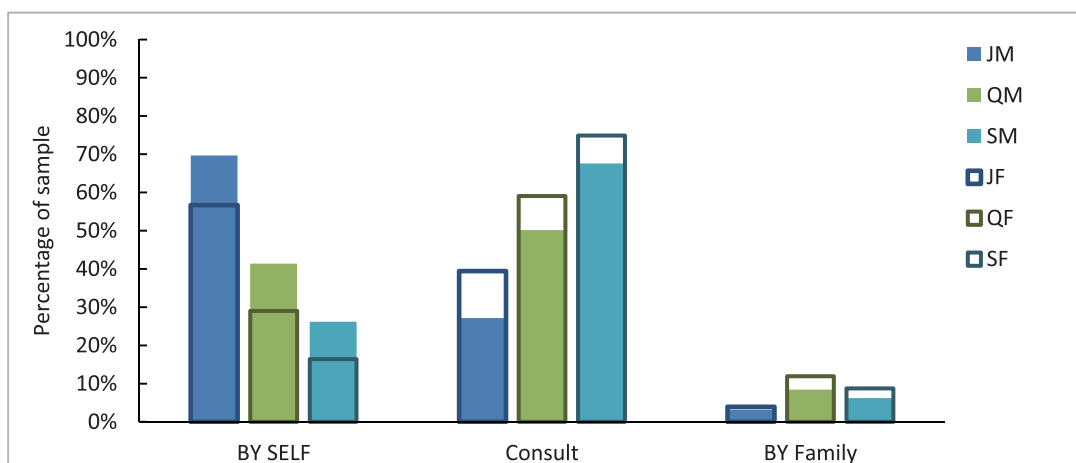


Fig. 4- 21 Vote decision-making

Note: "BY SELF" means one can determine who should be voted for on one's own. "Consult" means one needs to consult family members to determine who should be voted for; "By Family" means one has to ask the family's agreement to determine who should be voted for.

Sample size: Jiangsu men 435, women 383; Qinghai men 568, women 469; Shaanxi men 642, women's 561.

4.2.3 confidence in expressing themselves in public decision-making

Among the female respondents who have attended the villager's congress, the proportion of those who actively speak is 10 percentage points lower than that of men. The proportion that just listens to

others and does not speak is 10 percentage points higher than that of men (Fig. 4-22). The ratio of women who hope to improve their decision-making power is 2 percentage points lower than that of men. The ratio of those who do not hope so is 2 percentage points higher than that of men (Fig. 4-23).

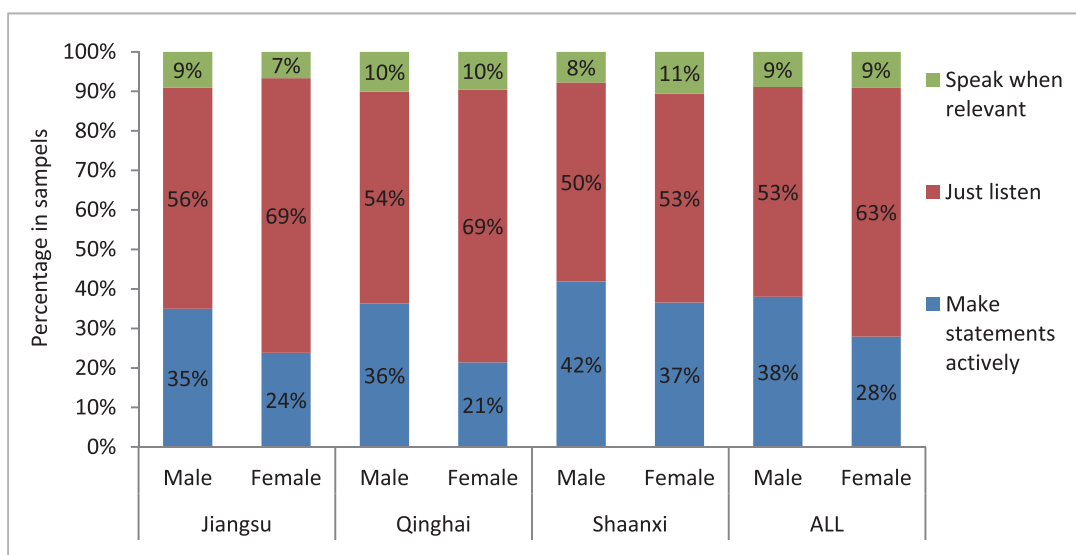


Fig. 4-22 Gendered difference in speaking attitudes in villager congress

Note: Sample size: Jiangsu men 429, women 390; Qinghai men 468, women 355; Shaanxi men 542, women 454.

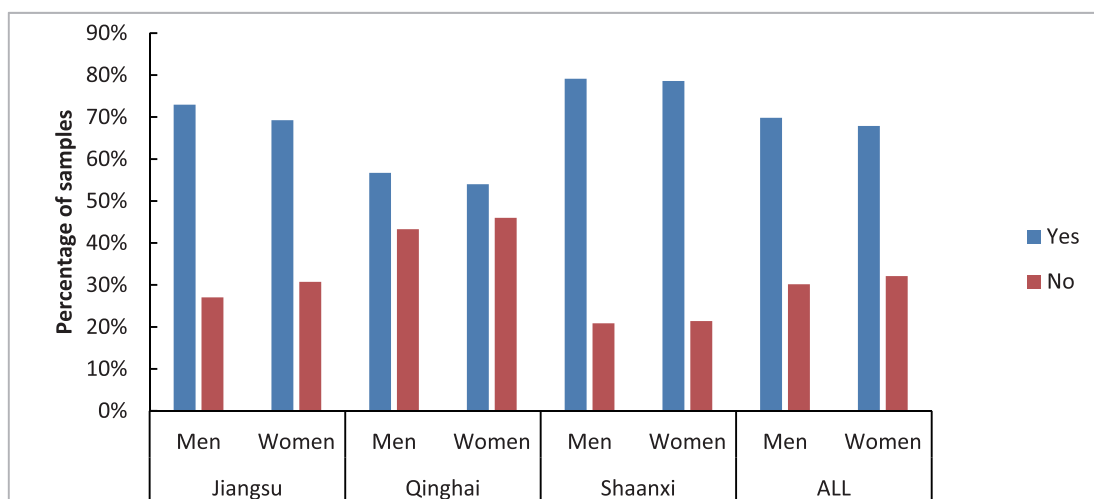


Fig. 4-23 Respondents' desire of enhancing controlling ability over daily affairs

Note: Sample size: Jiangsu men 529, women 530; Qinghai men 582, women 487; Shaanxi men 642, women 561. In the legend, "Yes" means "do desire", "No" means "do not desire".

4.3 Summary

Thus, it can be seen that the respondents in the study area are gender-blind. Females are in a quite disadvantaged position in terms of obtaining the natural, social, physical, funding and human capitals that are basic factors in their vulnerability, while the respondents – including females themselves – are not aware that women are vulnerable.

According to the survey, women's livelihoods are slightly more likely to be affected negatively by climate change and disasters. In addition, because women rely more on agricultural livelihoods and earn less than men, negative impacts would exacerbate their vulnerability. Women take on more

household duties, which constrain them from obtaining opportunities such as non-farm employment, training, and involvement in public affairs; this partially prevents them from enhancing their adaptive capacity. Women hold less land, fewer loan qualifications, and less decision-making power and autonomy; consequently, they are less confident and have fewer opportunities to change their lives. The disadvantages women experience are related to traditional gender roles, education levels and the traditional marriage customs. Policies should integrate such gender considerations to improve women's adaptation capabilities.

5. Policy recommendations for enhancing gender sensitivity

The present report investigated gender differences in access to natural, social, physical, funding and human capitals, as well as gendered vulnerabilities to the impacts of climate change and disasters. The findings indicate that women are more likely to be impacted negatively by climate change. Women have taken on more household duties, which constrain them from obtaining opportunities such as non-farm

employment, training and participation in public affairs; this partially prevents them from enhancing their adaptive capabilities. Women have fewer land resources, loan qualifications and less decision-making power and autonomy. Also, they are less confident in expressing their aspirations. Based on the findings of this research, the following policy recommendations are proposed.

5.1 Recommendations for China's government departments

First, strive to mainstream gender considerations as well as the rights of other vulnerable groups into national and sub-national climate change and disaster risk reduction policies, strategies and programs. Shift away from representing women as vulnerable in the climate change and DRR context to viewing them as active agents who must have an equal say in the design, decision-making and implementation of relevant plans and actions. Second, enhance gender-responsive implementation of climate change and DRR interventions by conducting gender and vulnerability analysis at the design stage and establishing sex-disaggregated baselines, indicators and targets. Third, municipal- and county-level governments should provide more regular training opportunities on knowledge and techniques for coping with climate change as well as training on gendered perspectives for relevant department staffs and officials, to improve the capabilities and results of climate change policy implementation. Fourth, from national to local levels, the Women's Federation should be fully involved; this can be accomplished by increasing the Federation's funding and enhancing knowledge of coping with climate

change among Women's Federation officials. Fifth, during the implementation of policies guaranteeing women's land rights and interests, full attention should be given to the influences of traditional marriage customs on women's land rights to reduce the number of cases in which women lose land rights. Sixth, integrate sex-disaggregated indicators and gender impact analysis into the sub-national authorities' reporting requirements on the implementation of climate change and DRR policies to ensure that the gender issues identified during policy implementation and feed back to macro-level for adjusting policies. Seventh, ensure that the collection of sex, age and disability disaggregated data in disaster contexts is frequently analyzed, disseminated widely, and used to inform, monitor and evaluate new policies and programs. Eighth, climate change and disaster agencies should seek to collaborate with agencies that have expertise in gender mainstreaming to promote integration of gender differences across climate change and disaster governance, utilizing best practices from other countries, when available.

5.2. Recommendations for NGOs

First, domestic environmental NGOs should consider engaging in more activities related to climate change and enhancing their awareness of gender.

Second, when engaging in climate change-relevant activities, NGOs should increase their cooperation and communication with each other.

5.3. Recommendations for UN Women

First, strengthen cooperation between UN Women and key government institutions in charge of the management of climate change and disaster reduction which concerning of gender and vulnerable groups

Second, enhance communications and information exchanges between UN Women and provincial-level government authorities. State-level government authorities are responsible for policy formation, while municipal or lower-level government authorities are responsible for policy implementation. From the perspective of China's administrative management system, the provincial level is the best entry point to participate in because it influences the adjustment and implementation of policies within provincial areas.

Third, communication with the government based on projects is the most effective way to consider gender and climate change when choosing and implementing pilot projects. The main methods could be case studies, pilot projects and capacity building. For pilot projects, Oxfam's project experience could be studied to learn how to cooperate with local governments by conducting projects that participate in or directly impact the government's policy implementation

Fourth, enhance officials' training and skills regarding .

gender by utilizing different training methods for officials at different levels. Because it is difficult to participate directly in the trainings of provincial-level officials, it might be effective to establish a relationship with the official trainers and educate them, and then have them train the officials. The training provided for municipal and county-level officials is generally organized by a superior organization or carried out with the help of a college or university and cadre training school, etc., in which is possible to participate through a capacity-building program using teaching materials, trainer resources, field surveys, etc.

Fifth, at the community level, strengthen instructional trainings and professional skills among women and vulnerable groups with regard to making a living and participating in decision-making, rather than conducting simple consciousness training. The goal is to improve their capacity to combat climate change and disasters. In trainings about consciousness, more attention should be paid to women's self-confidence and coping capacity. For example, advocate that males and females share the housework or provide some home-based trainings to avoid situations in which females cannot attend trainings because of heavy household burdens; also, design training materials that are suitable for women.

Appendix 1: Definition of Key Concepts

Gender Mainstreaming

Gender refers to the social attributes and opportunities associated with being male and female, and the relationships between women and men and girls and boys, as well as the relations between women and those between men. Mainstreaming a gender perspective is a strategy for making women's, as well as men's, concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of policies and programs in all political, economic and societal spheres so that women and men benefit equally, and inequality is not perpetuated. The ultimate goal is to achieve gender equality¹⁵.

Resilience

Resilience in a socio-economic system is defined as the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedback^{16,17}.

Adaptive Capacity

Adaptive capacity is the capacity to cope with either actual or expected external stress or disturbances. Adaptation or adaptive strategies tend to emerge at a community or society level, with shifts in cultural values and rules to secure livelihoods under regimes at various levels^{18,19,20,21,22,23}.

Vulnerability

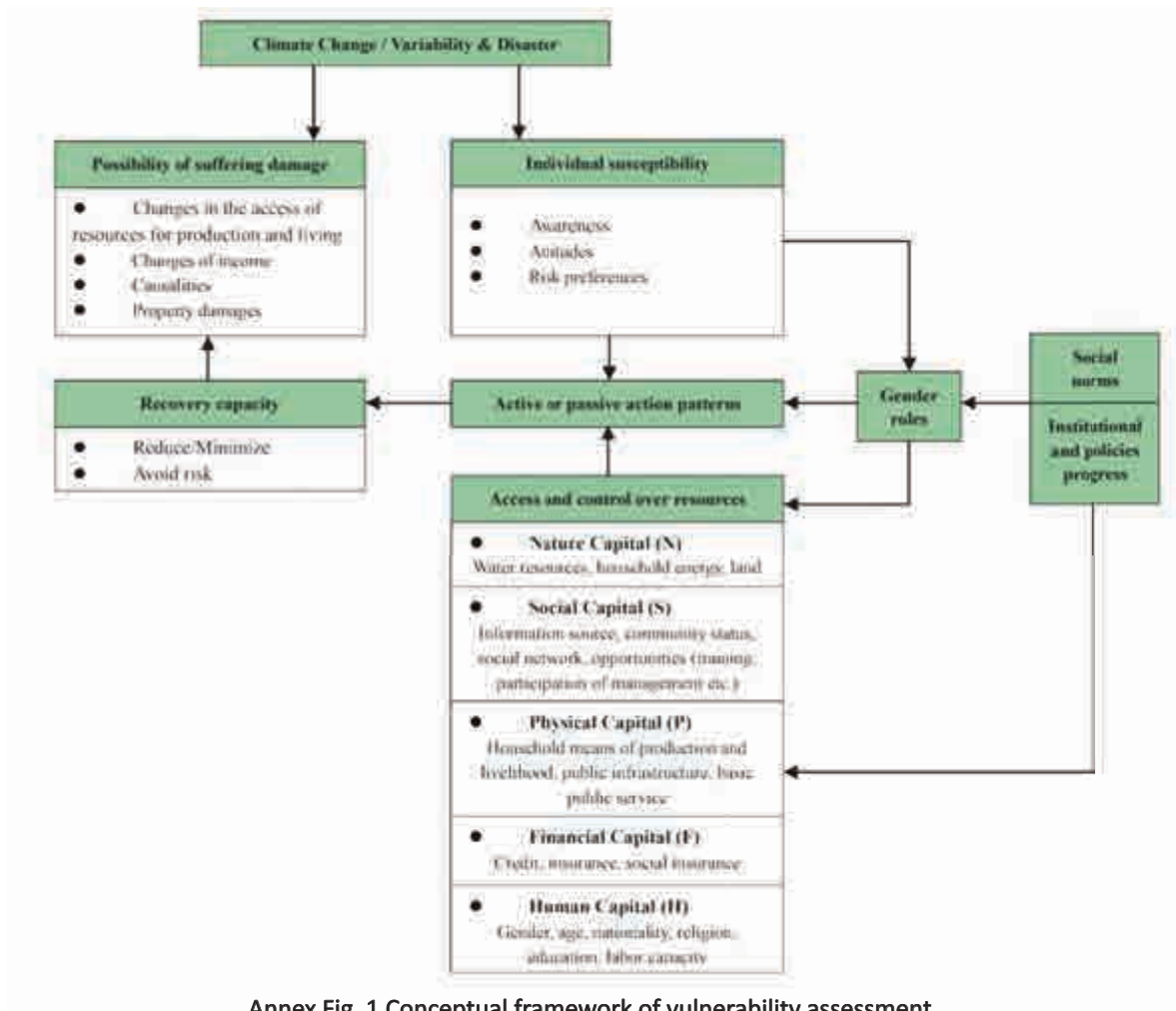
Vulnerability is the propensity or predisposition to be adversely affected. Vulnerability encompasses a

variety of concepts and elements, including sensitivity or susceptibility to harm and lack of capacity to cope and adapt²⁴ on the one hand; on the other hand, it is a set of conditions determined by physical, social, economic and environmental factors or processes that increase the susceptibility of a community to the impacts of hazards²⁵.

In entitlement theory, vulnerability is linked to economic and institutional factors. The crucial determinant is empowerment. To effectively reduce the vulnerability attributed to economic and institutional factors, it is helpful to empower vulnerable populations with more equal opportunities to access decision-making, participation and information. In the context of sustainable livelihoods, vulnerability refers to the susceptibility to circumstances of not being able to sustain a livelihood²⁶.

All three dimensions of vulnerability, i.e., susceptibility to hazard, possibility of suffering damage, and recovery capacity^{27,28}, are affected by gendered patterns of access to and control over resources, and by gender roles and responsibilities, norms and so on²⁹.

Based on the above understanding, the project used the conceptual framework of vulnerability shown in Annex Fig. 1, on which the questionnaire's conceptual framework was based. The questionnaire was designed to collect information about individuals' risk identification, risk vulnerability and the factors causing it, as well as their behavioral responses to risks. Vulnerability to risk and the factors causing it were determined based on the five capital logic frameworks used in assessments of sustainable livelihood development, as well as analyses of policy impact.



Annex Fig. 1 Conceptual framework of vulnerability assessment

Sustainable Livelihoods

Livelihood refers to the "means of securing the basic necessities - food, water, shelter and clothing - of life". The framework of the Sustainable Livelihoods Approach (SLA) was established by the UK's Department for International Development (DFID) in 2000 and consists of 5 aspects: Human, Natural, Social, Physical and Financial capitals. SLA can assist in improving our understanding of the livelihoods of

the rural poor, as well as the nature and causes of their poverty and vulnerability. In addition, as a tool, SLA can help to diagnose poverty and vulnerability throughout the project cycle. It can be used to identify the main constraints and opportunities faced by different individuals (men vs. women, women vs. women).

¹⁵ UN Economic and Social Council, 1997

¹⁶ Holling, 1973

¹⁷ Walker et al., 2004

¹⁸ Berkes and Jolly, 2001

¹⁹ Wilbanks and Kates 1999

²⁰ Adger 2003

²¹ Agrawal and Perrin 2008

²² Ayers 2011

²³ Bryan and Behrman 2013

²⁴ IPCC, 2014

²⁵ UNISDR, 2014

²⁶ Dercon, 2004

²⁷ Watts & Bohle 1993

²⁸ Adger et al., 2006

²⁹ Enarson & Morrow 1998

Appendix 2: Introduction to the survey investigation

1. Questionnaire survey of villagers

The project collected 3,402 valid samples in eight counties and 196 villages in the three pilot sites, Jiangsu Nantong, Qinghai Xining and Shaanxi Baoji; the valid return ratio was 91.5%. The survey sampling obeyed the following principles: (1) respondents should be local villagers who have lived locally over the long term, usually more than ten years; (2) respondents should be non-student villagers who are older than 18 years and staying in the village; (3) gender balance should be maintained (sample differences in terms of gender should be controlled within a statistically permitted range); (4) the population at different income levels should be well proportioned.

The male/female ratio of the valid 3,402 samples was

1.1:1, which was controlled within a statistically permitted range. The age of the majority of respondents was between 31 and 60, accounting for 71.0% of the total respondents. Among those, most were 41 to 50-years old, with 17.9% men and 13.6% women. For other age groups, the proportion of men and women was more or less the same. The physical status of the respondents was generally healthy. The proportion of respondents who are able to read and write is greater than 80%, 5% of them have obtained high education, and the majority of them have completed junior high school education, accounting for 43% of the total.

A total of 636,174 sample units in the three pilots were collected, out of which 535,923 were valid, the proportion of valid units reached 84.2% (refer to Table 1 for the pilot sites).

Annex Table 1 Valid ratio of sample collection in three pilot sites

	Expected total sample size	Valid total sample size	Valid ratio
Jiangsu	205700	165975	80.7%
Qinghai	205513	165100	80.3%
Shaanxi	224961	205226	91.2%

2. Questionnaire survey of officials

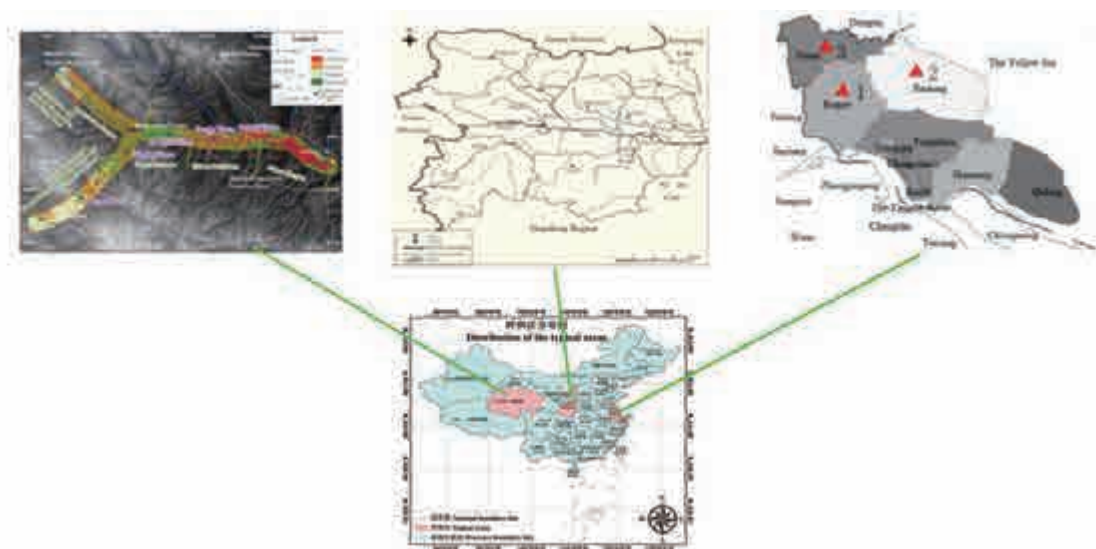
From the 78 interviewed officials, 75 samples were selected for questionnaire survey targeting one in each type of departments. Duties of officials, gender differences in posts, trainings for addressing climate change / reducing disasters / improving technical skills, etc. were investigated. The involved departments

include four main types: the information service information service agencies such as hydrological and weather bureaus; technology-oriented agencies working on agricultural machinery and technology promotion; administrative bureaus working on agriculture, flood and drought management and water conservancy; and social management bureaus, such as the Poverty Alleviation Office, Civil Affairs Bureau, and Women's Federation.

Appendix 3: Overview of pilot sites

In this study, three pilot areas were selected, including (i) a valley in a drought-and-flood-prone rural area in Baoji, Shaanxi Province; (ii) a valley in a drought-hale-frost-prone rural area in Xining, Qinghai

Province; and (iii) a typhoon-and-flood-prone developed rural area in Nantong, Jiangsu Province (Annex Fig. 2).



Annex Fig. 2 Location of the pilot sites

1. Typhoon-prone areas in Nantong, Jiangsu

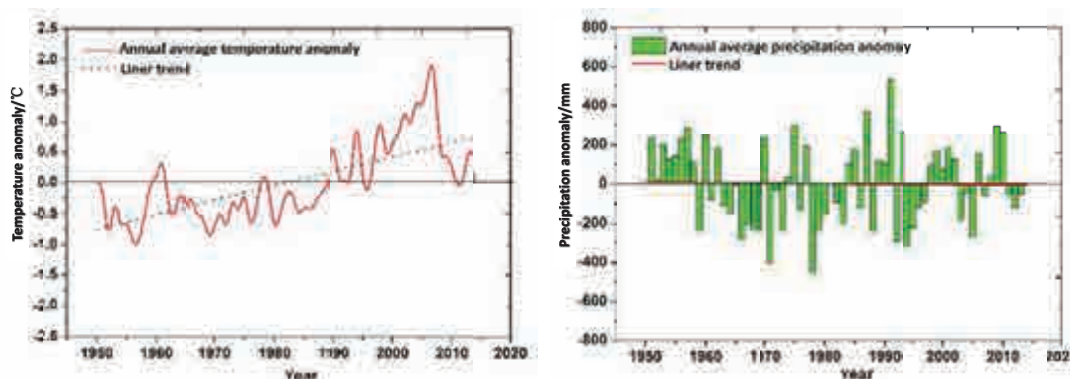
Located in the central part of Jiangsu Province and the northern part of the Yangtze River Delta, Nantong faces Shanghai across the river. Its coordinates are 31°1'~32°43' North and 120°12'~121°55' east. Nantong has jurisdiction over three districts (Chongchuan District, Gangzha District and Tongzhou District), two counties (Hai'an County and Rudong County), two development areas (Nantong Economic & Technological Development Area and Nantong Coastal Park), and one functional zone (Su-Tong Science & Technology Park), and it manages three county-level cities (Qidong City, Rugao City and Haimen City). In terms of the division of economic zones, it belongs to the northern Jiangsu area. As

one of the first 14 Chinese coastal cities to open to the outside world, it boasts of world-class fishing grounds, ports and a flourishing manufacturing industry.

The pilot area of Nantong has experienced climate change over the decades. From 1950 to 2014, it became warmer (Annex Fig. 3a), with an increase in the number of days with high temperatures; 2013, in particular, was a year with extremely high temperatures (Annex Table 2). According to the average precipitation in Nantong from 1950 to 2014, it has been getting a little drier, though this change in the trend is not strong (Annex Fig. 3b). Among the most frequent disasters in the region, rainstorms and

typhoons are the main causes of serious agricultural loss. From 1960 to 2014, there was an average of 2.7 typhoons affecting Nantong each year, one of which

had serious consequences. In recent years, Nantong experienced more typhoons, with five in 2013 and four in 2014.



Annex Fig. 3 The trend of temperature (left a) and precipitation (right b) in Nantong, Jiangsu Province from 1950 to 2014

Annex Table 2 Statistics of High Temperatures in Nantong between 1961 and 2014

Cities	Year with the largest number of days with high temperatures		Year with the largest number of running days with high temperatures		Average number of days with high temperatures	
	Number of days	Year	Running days	Year	1961-2010	1981-2010
Nantong	39	2013	13	2013	5.3	7.2
Hai'an	39	2013	15	2013	7.2	8
Rugao	35	2013	13	2013	5.9	5.4
Rudong	34	2013	13	2013	6.2	6.8
Tongzhou	37	2013	15	2013	7.3	8.1
Qidong	29	2013	13	2013	4.9	5.1
Haimen	36	2013	12	2013	5.3	5.7

2. Drought-hale-frost-prone area, Huangshui valley, Qinghai Province

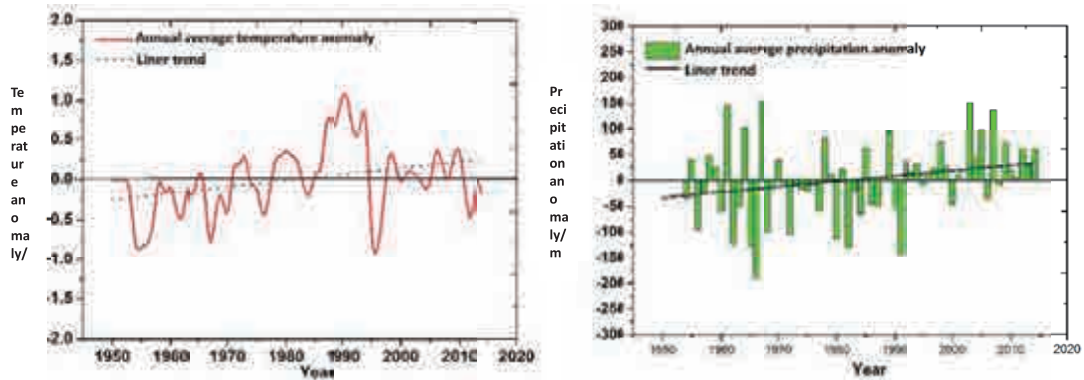
Huangshui valley is located in the agricultural and animal husbandry transitional zone, which at the edge of China's traditional agricultural area. It is the agricultural production base of Qinghai Province. Its average annual temperature is between 3° and 6° Celsius. Annual precipitation is between 370-660 mm. The total amount of arable, flat and irrigated land in comparison to sloping fields and dry land is low. At present, there are 534,000 hectares of farmland in Huangshui valley. Dry land and irrigable land account for 68.4% and 31.6% of the total land, respectively. Farmland with slopes greater than six

degrees accounts for approximately two-thirds of the area. Most of the land is used for dry farming, agriculture and animal husbandry, and is characterized by poor natural conditions, local economic underdevelopment and insufficient agricultural input.

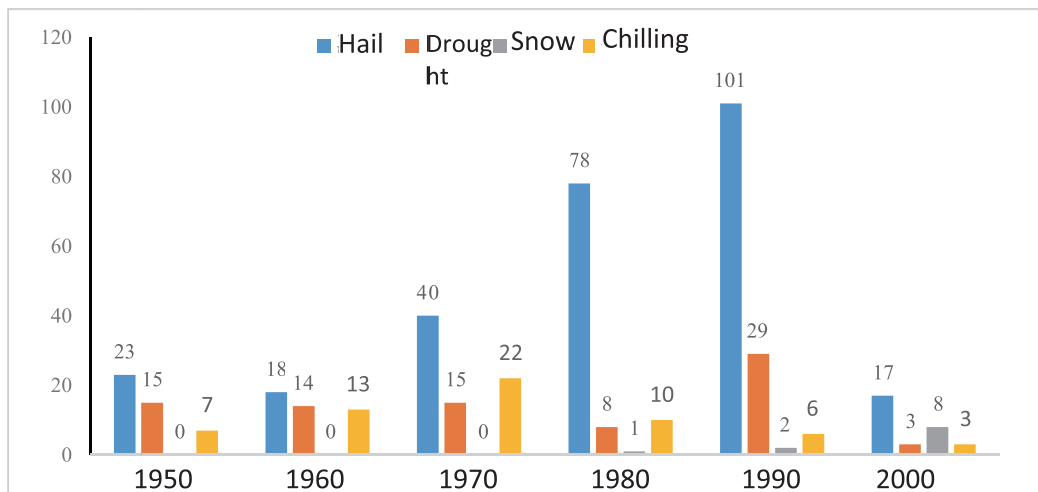
From 1950 to 2014, annual temperature and precipitation data show that Xining has been getting warmer and wetter (Annex Fig. 4). Since the beginning of the 21st century, the climate warming rate has been 0.37°Celsius/10a in Huangshui valley, which is significantly higher than the average level (over

nearly 50 years) at the national (0.16°Celsius/10a) and Qinghai province (0.35°Celsius/10a) levels. Among the changes, rise of temperature during winter is most significant. Second, precipitation decreased with an average decline of 3.70 mm/10a. Third, the frequency and intensity of extreme weather events increased, including extreme heat, cold, floods and droughts. Common meteorological

disasters refer to hail, drought, snow, low temperatures, etc. Through preliminary investigation, it was found that the frequencies of hail, frost and droughts have increased. As shown in Annex Fig. 5, the frequency of these disasters has been increasing since the middle-to-end of the last century, while from 2000 until the present, it decreased rapidly.



Annex Fig. 4 Trends of temperature (left) and precipitation (right) in Xining, Qinghai Province from 1950 to 2014



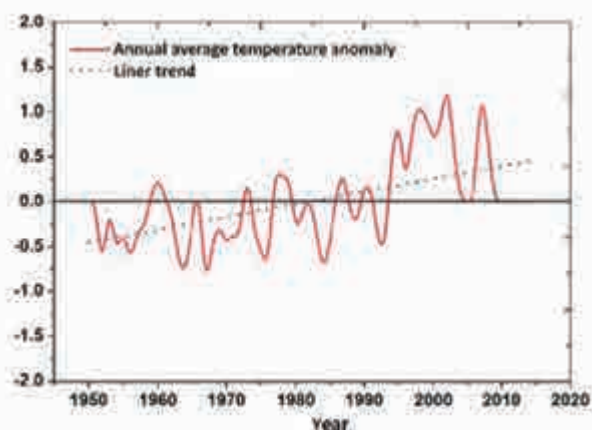
Annex Fig. 5 Disaster occurrence frequency since the 1950s in the Huangshui valley region

3. Drought and flood prone area of Weihe river basin in Baoji, Shaanxi Province

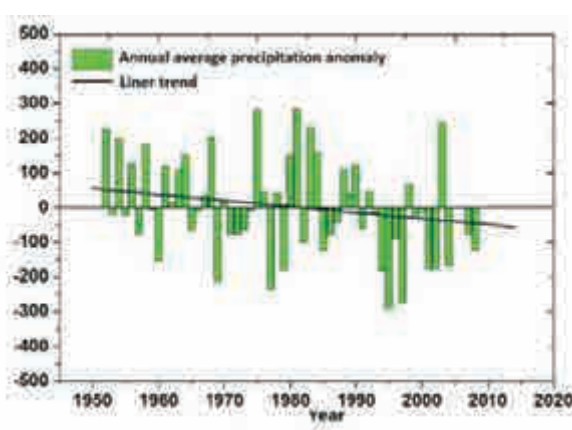
Baoji city is located in the middle reaches of the Weihe river basin, which is the center of four capital cities: Xi'an, Chengdu, Lanzhou and Yinchuan. This makes Baoji an important transportation hub leading to the southwest and the northwest. Baoji is a typical valley city in a warm temperate zone with a semi-arid sub-humid continental monsoon climate, which makes it sensitive to the environment, and climate fragile. The average annual precipitation in Baoji is between 500-900 mm, and the average water resource amount per capita is 992 m³, approximately 53% of the national average. The annual average temperature ranges between 7.9-13.2°Celsius. The annual average temperature of Baoji has been rising, with fluctuations, at a rate of 0.3°Celsius/10a. The average temperature over the last 50 years was 13.3°Celsius. The highest temperature was 14.95°Celsius, in 2013, while the lowest was 12.04°Celsius, in 1967 (Annex Fig. 6). The temperature variation range is 2.91°Celsius. Temperature anomalies before 1993 were mostly negative, after which the temperature rose gradually. The annual average precipitation of Baoji decreased, with fluctuations, at a rate of 0.8 mm/10a. Average

precipitation over the last 50 years was 650.8 mm. The highest amount was 934.5 mm, in 2011, while the lowest was 380.4 mm, in 1995. The precipitation variation range is 374.8 mm, with a pole ratio of 2.5. Precipitation changed in a relatively stable way. Rainfall was high in the 1980s, and it gradually decreased from the 1990s to the early 21st century. The whole study period belongs to this period of low rainfall. Precipitation changed stably from the 1960s to the 1980s, and in the 21st century the fluctuation amplitudes have not been large. Moreover, the decreasing trend in precipitation is not strong prior to 1991, while rainfall declines after that point (Annex Fig. 7).

Drought and hail are the two main natural disasters affecting this region. Baoji's continuous dry period index rises with fluctuations at a rate of 0.4d/10a. The average number of dry days over the last 50 years was 51.3d. The longest dry period was 113d, in 1983, and the shortest was 15d, in 2008. The continuous dry period first decreased, with fluctuations, and then increased gradually, with a turning point at the end of the 1970s.



Annex Fig. 6 Temperature change trend in Baoji between 1950 and 2014



Annex Fig. 7 Precipitation change trend in Baoji between 1950 and 2014

Appendix 4: List of relevant CC and DRR laws and policy documents

Annex table 3 Regulatory Framework for Climate Change Mitigation

Classification	Description	Date of issue
Law	Act on Addressing Climate Change	Under discussion
	Energy Conservation Law	2007
	Renewable Energy Law	2009 revised
	Regulations on Returning Farmland to Forest	2002
Planning	National Program for Climate Change	2007
	Plan for Economic and Social Development of the People's Republic of China (the 13 th at present)	2016
	National Planning on Addressing Climate Change (2014-2020)	2014
	The 12 th Integrated Work Program for Energy Saving and Emission Reduction (Document of State Council [2011]NO.26)	2011
	The 12 th Integrated Work Program for Controlling Greenhouse Gas Emissions (Document of State Council [2011]NO.45)	2011
	The 12th Five-Year Plan for Energy Development (Document of State Council [2013]NO.2)	2013
	Long-term Planning for Energy Saving (fagaihuanzi [2004]NO.2505)	2004
	The 12th Five-Year Plan for Energy Conservation and Emissions Reduction (Document of State Council [2012]NO.40)	2012
	Industrial Energy Saving "12th Five-Year" Plan (Ministry of Industry and Information Technology)	2012
	Long-Term Planning of Renewable Energy Development (2020) > (Development and Reform of Energy (2007)	2007
	Renewable Energy Development "12th Five-Year" Plan (National Energy Board)	2012
	Mid- to Long-Term Development Plan for Nuclear Power (2005-2020)	2007
	Coal Industry Development "12th Five-Year" Plan > (Development and Reform of Energy)	2012
	Development and Utilization of Coalbed Methane "12th Five-Year" Plan (Development and Reform of Energy (2011) 3041)	2011
	Forest Coping with Climate Change, "13th Five-Year" Action Points	2014
	Key Work Arrangement and Division of Labor of Forestry in 2014 to Cope with Climate Change	2014
Normative documents	System of Statistical Reporting for Departments in Addressing Climate Change	Trial implementation in 2015
	Statistical Indicator System for Addressing Climate Change	2014
	Demand Schedule of Statistics from Government's Integrated Statistics System for Addressing Climate Change	2014
	Plan for Responding to El Nino for Disaster Prevention and Harvesting	2015
	Program to Implement Statistical Work for Addressing Climate Changes	2013
	Proposals on Strengthening Statistical Work for Addressing Climate Change	2013
	Technical Manual for Regional and Provincial Meteorological Departments to Address Climate Change	2014
	Decision of the State Council on Strengthening the Work of Energy Conservation.	2006

Statistical Monitoring and Evaluation Implementation Program of Energy Conservation and Emission Reduction	2007
Unit GDP Energy Consumption Assessment System Implementation Plan	2007
Interim Measures for the Supervision and Administration of Energy Conservation and Emission Reduction of Central Enterprises	2010
Interim Provisions on Promoting the Adjustment of Industrial Structure	2005
National Key Energy Conservation Technology Promotion Goal (first batch to third batch)	2008, 2009,2010
Energy Conservation and Emission Reduction Comprehensive Work Plan	2007
Notice of the State Council on Further Strengthening the Work of Eliminating Backward Production Capacity.	2007
Notice on the Further Implementation of the Differential Pricing Policy	2007
Notice on Strengthening Energy Saving Evaluation and Review of Fixed Assets Investment Projects	2007
Guidance on Improving and Strengthening the Work of Financial Services in the Field of Energy Saving and Environmental Protection	2007
Guidance on Energy Conservation and Emission Reduction Credits	2007
Comments on Financial Services Further Supporting Energy-Saving Emission Reduction and Elimination of Backward Production Capacity	2010
Notice of the Relevant Import Tax Policy on the Implementation of the State Council on Accelerating the Development of the Equipment Manufacturing Industry	2007
Notice on the Adjustment of Consumption Tax on Passenger Cars	2008
Financial Incentive Funds Management Measures for Energy-Saving Technological Transformation	2011
Financial Subsidies to Promote Efficient Lighting Products (Fiscal 2009)	2009
Interim Measures for the Administration of Financial Subsidy Funds for the Promotion of Efficient Lighting Products	2009
Notice on Accelerating the Implementation of Contract Energy Management to Promote the Development of Energy Conservation Service Industry	2010
Interim Measures for the Administration of Financial Incentive Funds for Energy Management Contract	2010
Interim Measures for the Administration of Special Funds for Renewable Energy Development	2006
Notice of the State Council on the Improvement of the Policy of Returning Farmland to Forests	2007
Proposals on Addressing Climate Changes in Ocean Field by State Oceanic Administration (Guo Hai Fa [2007]No. 21)	2007

Annex table 4 Regulatory framework for adapting to climate change

Classification	Description	Date of issue
Law	<i>Act on Addressing Climate Changes</i>	Under discussion
	<i>National Climate Change Adaptation Strategy, setting 2020 as the phased target year</i>	2013
	<i>National Planning on Addressing Climate Change (2014-2020), setting 2020 as the target year</i>	2014
Planning	<i>Key Points for Forestry Action Plan during the 13th Five-year Plan</i>	2014
	<i>Forestry Action Plan for Adapting to Climate Changes (2015-2020)</i>	2014
	<i>Key Work Arrangement and Work Division Program on Forestry Action Plan for Addressing Climate Changes</i>	2014
	<i>System of Statistical Reporting for Departments in Addressing Climate Changes</i>	Trial implementation in 2015
	<i>Statistical Indicator System for Addressing Climate Changes</i>	2014
	<i>Demand Schedule of Statistics from Government's Integrated Statistics System for Addressing Climate Change</i>	2014
	<i>Plan for Responding to El Nino for Disaster Prevention and Harvesting</i>	2015
	<i>Program to Implement Statistical Work for Addressing Climate Changes</i>	2013
Normative documents	<i>Proposals on Strengthening Statistical Work for Addressing Climate Changes</i>	2013
	<i>Technical Manual for Regional and Provincial Meteorological Departments to Address Climate Changes</i>	2014
	<i>Circular Strengthening of Health Emergency Work to Cope With Heavy Snow and Other Extreme Weather (Wei Da Ming Dian [2009] No. 248)</i>	2009
	<i>Urgent Circular Strengthening of Medical Services in High-temperature Weather in Summer (Wei Fa Ming Dian [2010] No. 61)</i>	2010
	<i>Circular Strengthening of Medical Services in High-temperature Weather in Summer (Guo Wei Ban Ying Ji Han [2014] No. 452)</i>	2014
	<i>System of Statistical Reporting for Departments in Addressing Climate Change</i>	Implemented in 2014
	<i>Proposals on Addressing Climate Change in Ocean Field by State Oceanic Administration (Guo Hai Fa [2007]No. 21)</i>	2007

Annex table 5 Policy and regulation framework for disaster prevention and reduction that focuses on natural disasters

		Single disaster						
	Multiple disasters	Flood	Meteorology	Earthquake	Geology	Marine	Agricultural biology	Forest
Laws	<i>Law on Response to Emergencies (2007)</i>	<i>Flood Control Law of the People's Republic of China (1998)</i>	<i>Law of the People's Republic of China on Meteorological Services (2014)</i> <i>Law of the People's Republic of China on Prevention and Control of Desertification (1998)</i>	<i>Law of the People's Republic of China on Protecting Against and Mitigating Earthquake Disasters (2009)</i>			<i>Law of the People's Republic of China on the Entry and Exit Animal and Plant Quarantine (1992)</i>	<i>Forest Law of The People's Republic of China (1998)</i> <i>Grassland Law of the People's Republic of China (2002)</i>
Administrative regulations	<i>Regulation on the Relief of Natural Disasters (2010)</i> <i>Interim Measures for Social Assistance (2014)</i>	<i>Flood Control Regulation of the People's Republic of China (2005)</i>	<i>Drought Control Regulation of the People's Republic of China (2004)</i> <i>Regulation on Defense against Meteorological Disasters (2010)</i>	<i>Regulation on the Administration of Earthquake Forecasting (1988)</i> <i>Regulations on the Emergency Preplans for Destructive Earthquakes (1995)</i> <i>Regulations on Administration of Seismic Safety Evaluation (2001)</i> <i>Regulation on the Administration of Earthquake Monitoring (2004)</i> <i>Regulation on Post-Wenchuan Earthquake Restoration and Reconstruction (2008)</i>	<i>Regulation on the Prevention and Control of Geologic Disasters (2004)</i>	<i>Regulation on the Administration of Ocean Observation and Forecasting (2012)</i>	<i>Regulation on Forest Pest and Disease Control (1989)</i> <i>Rules for the Implementation of the Frontier Health Quarantine Law of the People's Republic of China (1997)</i>	<i>Regulation on the Implementation of the Forestry Law of the People's Republic of China (2000)</i> <i>Regulations on Grassland Fire Prevention (2009)</i> <i>Regulation on Forest Fire Prevention (2009)</i>

Annex table 6 Policy and regulation framework for disaster prevention and reduction that focuses on disaster relief

Disaster relief		Policies and regulations
Pre-disaster preparedness	Material reserves	Reference List of Manufacturers of Natural Disaster Emergency Relief Materials (revised and issued annually)
		Interim Measures of the Central Government for the Management of Disaster Relief Material Reserve Warehouse (2013)
		Administrative Measures of the Central Government for Disaster Relief Materials Reserve (Min Fa [2014] No. 221)
		<i>Opinions about Intensifying the Building of Material Reserve System for Natural Disasters</i> jointly released by the Ministry of Civil Affairs and eight other authorities (2015)
Emergency response in disaster	Disaster monitoring, warning and forecasting	Regulations on the Defense against Meteorological Disasters (2010)
		<i>Opinions of the General Office of the State Council about Intensifying Meteorological Disaster Monitoring and Warning and Information Disclosure Work</i> (Guo Ban Fa [2011] No. 33)
		National General Contingency Plan for Public Emergencies (2006)
		National Contingency Plan for Natural Disaster Relief (2011)
Emergency work	Contingency plan	<i>National Contingency Plan for Natural Disaster Health (Trial)</i> (Wei Ying Ji Fa [2009] No. 40)
		<i>Opinions of the Ministry of Civil Affairs about Intensifying Disaster Relief Emergency Response System</i> (Min Fa [2009] No. 148)
		<i>Notice of the General Office of the State Council on Issuing the Measures for the Administration of Emergency Response Plans</i> (Guo Ban Fa [2-13] No. 101)
		Rules of the Ministry of Civil Affairs on Disaster Relief Emergency Response (Min Fa [2014] No. 98)
Post-disaster restoration	Disaster statistics	Statistical System of Natural Disasters (2014)
		Statistical System of Losses from Extraordinary Serious Natural Disasters (2014)
		Regulation on Natural Disaster Relief (2010)
		Interim Measures for Social Assistance (2014)
Post-disaster reconstruction	Disaster relief	Interim Measures for the Management of Natural Disaster Relief Funds (Cai She [2011] No. 6)
		Rules on Providing Life Assistance to Affected People in Spring and Winter (Min Fa [2014] No. 169)
		Opinions of the Ministry of Civil Affairs about Intensifying Evaluations on Natural Disaster Relief (2012)
		Regulation on Post-Wenchuan Earthquake Restoration and Reconstruction (2008)

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