CLIMATE ADAPTATION IN ASIA

Local Actions of Eight Urban and Rural Communities

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無窮世界 World Without Poverty

Chapter 1: Introduction

1. Equal Importance of Climate Change Mitigation and Adaptation

The 13th Conference of the Parties (COP13) to the United Nations Framework Convention on Climate Change (UNFCCC) held in Bali in 2007 concretely established a global action plan responding to climate change and five working areas:

- Creating a shared vision
- Mitigation of climate change
- Adaptation to climate change
- Technical support
- Financial support

Among the above, 'mitigation' and 'adaptation' are the two primary areas for countries to focus their efforts within their territories. And according to the UNFCCC, the two areas are defined as:

- Mitigation: Efforts aimed at reducing greenhouse gas emissions and the emission sources, as well as enhancing sinks to remove greenhouse gas.
- Adaptation: Adjustments in response to the impacts related to actual or expected climatic stimuli and their effects. It targets to reduce or avoid damages, or even to benefit from opportunities associated with climate change.

Since the introduction of the UNFCCC in 1992, global efforts to address climate change have mainly focused on mitigation. The media and the public have focused on the commitments and actions taken by nations, cities and stakeholders in reducing greenhouse gas emissions, which is necessary and essential. The Kyoto Protocol formulated in 1997 can be regarded as a landmark document for worldwide mitigation actions.

It is late until 2003, the UK released the world's first national climate adaptation strategy, and in 2007, addressing the climate challenges faced by least-developed countries (LDCs), the international community set up the Nairobi Work Programme. The European Union also announced their climate adaptation plans in 2007 and 2013, attracting more and more attention on climate adaptation.

In the Paris Agreement adopted in 2015, apart from reaching an international consensus on the effort to limit the Earth's warming to 2°C, countries proposed a series of adaptation actions. By 2019, the Global Center on Adaptation (GCA) published its flagship report 'Adapt Now: A Global Call for Leadership on Climate Resilience', which

clearly identified what specific areas needed attention under global adaptation actions, many countries have started developing and releasing national strategies and action plans for climate adaptation.

In recent years, the impacts brought by the increasing frequency and intensity of extreme weather events on human activities and communities have become more evident. This has led to a growing awareness and recognition of the public to the work of climate 'adaptation'.

2. Importance of Climate Adaptation to People Living in Poverty

When discussing the impacts of climate change and its solutions, we always comprehend and analyse them from the perspective of all human beings or as a whole community. But in fact, aside from that aspect, we have to realise that climate change has different impacts and brings different levels of challenges to different countries, regions, communities and groups. Oxfam has always been on a mission to eradicate poverty and social inequalities. On the issue of climate, we place special emphasis on the risks and effects encountered by the economically disadvantaged communities and groups, as well as the resources and capabilities at their disposal when they face the climate challenges. They generally live in most disaster-prone areas, and their normal family and community life are more susceptible to disruptions in the face of extreme weather, leading to the loss of regularity. The means by which they earn a living, whether it's through the rural small-scale farming or outdoor labour in urban areas, become increasingly unstable due to climate change.

Communities and groups, who are the least responsible for greenhouse gas emissions, suffer the most and pay a huge price for the impacts of climate change. That is why Oxfam places great emphasis on climate justice.

In response to climate justice, we on one hand need to continue urging stakeholders all over the world (especially those developed and relatively affluent countries, as well as groups that should bear more responsibility for emissions) to take collective action to reduce greenhouse gas emissions and mitigate climate change, keeping global warming below 1.5 °C by 2050. On the other hand, we must begin to prepare to adapt to increasingly severe weather and climate disasters in the environment, ecology, agriculture and community life. We particularly focus on regions, communities, and groups that are more vulnerable in terms of their livelihoods and subsistence. It is necessary to provide them with more resources and support, work together to assess risks and develop action plans to face crises.

3. Three Areas to Address in Climate Adaptation

In recent years, it has been encouraging to see that many nations and governments have begun to take substantial actions in dealing with climate change. Besides reducing emissions, many localities have formulated different policies, plans, and action proposals for climate adaptation. They have also invested in public resources in collaboration with all sectors of society to combat the crisis. However, in fighting for climate justice, we realise that in the policies, public planning and actions towards climate change, there are three dimensions that need to be addressed and prioritised:

- It is important to not only focus on overall urban planning while overlooking the unique risks and urgent needs of communities in rural and urban fringe areas.
- Among the industry-wide or economics-oriented analysis and policy support plans, it is necessary to supplement a livelihood perspective that includes small farmers, workers, and specific groups, and helps identify their needs and livelihood transformations.
- Just like in the analysis and response to various disasters, we all know that women have unique needs and can contribute their views and capabilities to provide the community with more comprehensive care. Therefore, the direct participation of women is important. After analysing climate change adaptation efforts, we believe there should be more effort to collect women's views and their participation should be strengthened.

4. Encouraging Community Participation to Help Communities Adapt to Climate Change More Effectively

Oxfam has always worked in relatively underprivileged communities and groups in both rural and urban areas. In the past, we have seen how encouraging community participation, and creating knowledge and taking action collectively were key to allow us to work alongside with the disadvantaged groups, promote equality and make a sustainable impact.

Doing this has not only allowed communities and groups to more effectively acquire new knowledge, techniques, and ways of taking action, thus enabling external knowledge and skills to be adapted to local environmental conditions, but has also provided room to uncover indigenous wisdom and traditional practices from local communities and groups to create more ways for communities to adapt to climate change.

Furthermore, we understand that external assistance and support often have limitations in terms of duration. Through participatory approaches, we can help the

communities build their local capacity and foster a cooperative atmosphere. By the time external support gradually withdraws, the communities will be already equipped with the ability and a platform for collective actions. And in the face of potential changes, they can continue to react with appropriate adapting actions. This is crucial for the sustainable development of communities.

In the following chapters, by studying the actual actions taken by eight communities, we can see that, from the perspective of vulnerable communities and groups in urban and rural areas, the unique challenges and needs brought by climate change. Meanwhile, their ability to react and the possibilities and ways of external supportive interventions can also be observed. Additionally, throughout the report, we will see how communities and women participate adapting to local conditions, and the participatory and sustainable approaches.

5. The Framework to Present Experiences from Eight Urban and Rural Communities

Before reading the actions of various communities in this study, the following is a comprehensive and comparative overview of these eight communities.

The basic information and summarised features of the eight urban & rural communities are as below:

Case Name	Urban Cleaning Workers	Urban Subdivided House Tenants	Tea Farmers Villages	High Altitude Grassland Herdsmen Communities	Dry Area Villages	Mountain Villages of Ethnic-Minority	High Altitude Rural Communities	Coastal Villages
Country/ Region	Hong Kong Special Administrative Region, China	Hong Kong Special Administrative Region, China	Liugou Village, Shaanxi Province, China	Jiatang Grassland, Qinghai Province, China	Wangjinzhuang Village, Hebei Province, China	Shitoucheng Village, Yunnan Province, China	Baitadi District, Nepal	Eastern Samar Province, Philippines
Geographic Features	Outdoor workers in a subtropical city	Small tenants in an overcrowded community of a subtropical city	Small farmers in a cold mountainous area	Herdsmen of grassland in a cold and high area	Small farmers in a cold and arid mountainous area	Small farmers in a temperate mountainous area	Women in rural communities in highland	Villagers on the coast of a tropical island country
Economic Livelihood	Wages from outdoor work	Various low-wage jobs in the city	Tea planting and sales; going out to work in the city	Grazing to obtain dairy products; going out to work in the city	Various kinds of crops by small family farms; going out to work in the cities of the home country	Various kinds of crops by small family farms; going out to work in the cities of the home country	Small family farms and livestock farms; going out to work in the cities of the home country or foreign countries	Fishing; small family farms; going out to work in the cities of the home country or foreign countries
Climate Risk	Working outdoors on more frequent hot days	More frequent hot days increase health risks	Increasingly erratic rains, heat and drought have	Increasingly erratic rainfall, heat, drought, and	Increasingly erratic and sudden heavy	Increasingly erratic and sudden heavy rainfall, heat	The increasing number and intensity of	More and stronger typhoons have caused loss of

	brings greater health risks and discomfort.	and discomfort in crowded living environments.	reduced the quality of the tea plantation and lowered their incomes.	snowstorms have degraded grasslands and increased the labour required for grazing; winter mortality among cattle has increased and lowered their incomes.	rainfall, heat and drought have reduced crop yields and lowered their incomes.	and drought have reduced crop yields and lowered their incomes.	torrential rains and floods have caused crop harvest, housing and personal safety problems; erratic rainfall and high temperatures have caused unstable harvests.	coconut harvest and difficulties in going to the sea, resulting in reduced income; coupled seawater flooding brought by typhoons, crops and household losses have also been made.
Climate Adaptation Actions	Improve personal work equipment Improve the settings and equipment of the work environment Strengthen the Occupational Safety and Health Ordinance to provide workers with protection against	Improve the ventilation of the living environment Assist residents to purchase energy-saving home appliances and cooling facilities Add common space and services in the community	Promote organic farming to enhance soil fertility and moisture retention Improve the village environment and strengthen the climate resilience of tea gardens and	Plant diverse grass species Improve pasture management practices Store sufficient forage for winter Explore other alternatives of livelihood	Repair and expand traditional water cellars to collect rainwater to cope with droughts Select and breed traditional local crops to strengthen the climate resilience of seeds	Select and breed traditional local crops to strengthen the climate resilience of seeds Diversify climate risks through diversified planting of crops Rehabilitate the original and traditional	Strengthen disaster warning Introduce water-saving farming techniques Promote diversified income Diversify climate risk through diversified planting of crops	Reduce and clean up waste Dredge the flood drainage pipes Reduce the frequency and intensity of natural disasters through nature-based solutions Provide villagers with new income sources

	extreme weather Establish hot environment index as the standard for rest or suspension of work in hot environments.	Provide other storage space outside the residence for the subdivided house residents.	surrounding ecosystems Establish cooperatives and consumer support to share the risk of climate fluctuations and disasters Improve drainage hardware and enhance community's awareness of disaster prevention and mitigation Explore the income from the tertiary sectors of tea gardens		Diversify climate risks through diversified planting of crops Make good use of donkey manure for circular agriculture and reduce the use of chemical fertilisers Promote organic farming to enhance soil fertility and moisture retention	catchment irrigation system, strengthen common management and rational distribution of water Promote organic farming to enhance soil fertility and moisture retention.	Promote organic farming to reduce damage to the environment	through nature-based solutions

In Chapter 2, we will introduce the case studies and cover the following aspects:

- Basic background information about the communities
- Climate change conditions, challenges, and adaptation issues
- Climate actions taken or planned
- Action outcomes (including economic, ecological, and social aspects)
- Funding and resources

In Chapter 3, we will analyse and summarise the significant experiences and lessons learned from these eight community cases. They will provide references and insights for other climate action practitioners in urban and rural areas. Moreover, based on these analysis, Chapter 4 will suggest recommendations on policies that contribute to climate change adaptation.

6. Chapter Conclusion

We would like to emphasise that the cases presented in this collection of cases on community actions are not intended to showcase perfect or satisfactory examples. It can be seen that each community action approach will face challenges and limitations. However, within these difficulties and shortcomings, you can also find the strengths and hope of the community. More importantly, from these cases, we want to conclude and accumulate experiences and knowledge to provide references for climate action practitioners and policymakers in other communities and groups to continues, and continuously for human society who is facing the century's challenges, to provide wisdom and resources for the next generation.

Chapter 2.1: Hong Kong - Climate Change Adaptation for Outsourced Cleaners

Background

Hong Kong, like other coastal cities, is facing multiple climate-related threats. One of the distinct phenomena is the increase in the average annual temperature. Based on information from the Hong Kong Observatory, the Very Hot Weather Warning has been issued ten times this June, which is higher than last June.

People living in poverty are often the most affected by extreme weather as a result of climate change. One of the main reasons behind this is that most of them work a grassroots job that are often more exposed to extreme heat. Yet, even after years of discussions, the government still refuses to include heat stroke and other heat-related diseases as legal occupational diseases and has only established a guideline for rest arrangements under the Heat Index this year. Oxfam Hong Kong discovered earlier that many cleaning companies outsourced by the government did not comply with the Labour Department's 'Guidance Note on Prevention of Heat Stroke at Work'. The majority of interviewed cleaners still need to work long hours under the scorching sun without associated protection and safeguard measures. Oxfam Hong Kong believes that the situation reflects the inadequacy of the current implementation of the guidelines through inspections.

Under the impact of climate change, the Hong Kong government has been committed to 'emission reduction' in recent years and striving to achieve carbon neutrality by 2050. However, the effort in the aspect of climate 'adaptation' is still insufficient. For example, in Hong Kong's Climate Action Plan 2050, the government only proposed climate adaptation measures regarding infrastructure, drainage management, maintenance and repair of old buildings, but failed to acknowledge the impact of extreme weather on the grassroots, especially occupational safety assurance in hot weather.

Oxfam Hong Kong has always been concerned about the remuneration and rights of outsourced cleaners. In view of climate change, the weather in Hong Kong is gradually getting hotter, threatening the health of the grassroots population. Therefore, through policy initiatives and campaigns that directly support cleaners, Oxfam would improve their working conditions in extreme weather.

Climate Adaptation

Oxfam published two reports – 'Impacts of extreme heat on street cleaners' report' and 'Sanitation Workers' Working Condition at Refuse Collection Points (RCPs) in Extreme Heat' in 2021 and 2022 respectively – in the hopes of heightening government and society's awareness of cleaners' practical working conditions and their needs through research findings.

In 'Impacts of extreme heat on street cleaners' report, findings revealed the 200 surveyed cleaners worked an average of 25.9 days per month, during which most of the time they worked outdoors. When the research team was

conducting field interviews, the average temperature of the working environment was as high as 34.3°C, with 90% of the workers working in areas directly exposed to sunlight. Concurrently, 68% of interviewees stated that they had to work continuously outdoors in a scorching environment all day, and 32% reported having no rest time during outdoor work. Furthermore, even when accounting for breaks, almost 40% and 20% of the respondents mentioned that they had to toil for 3 and 4 hours under the intense sun before being able to rest a moment.

The study 'Sanitation Workers' Working Condition at Refuse Collection Points (RCPs) in Extreme Heat' found that the average temperature at RCPs reached 32.2 °C, exceeding the average temperature for that month (30.3°C) recorded by the Hong Kong Observatory. Among the 200 workers polled, half expressed difficulty in resting inside RCPs. One-sixth (16%) attributed this to the lack of resting space, while 30% and 41% respectively attributed this to poor hygiene and stifling heat. A vast majority of workers (78%) stated that they had to seek shade on the street to take a break, leading to a misunderstanding among the public that cleaners are slacking. Concerning equipment, despite the 'Guidance Notes on Prevention of Heat Stroke at Work' specifying that employers should provide cleaners with drinking water and hats, up to 43% of the interviewed workers pointed out that their employers failed to supply drinking water and 13% stated that their employers did not provide hats. These reflect that an overwhelming majority of employers did not fully implement the guidelines and highlight the inadequacy of the current inspection-based enforcement by the Labour Department.

Climate Risks

In the study 'Impacts of extreme heat on street cleaners' report', nearly half (45.5%) of the surveyed workers expressed that they frequently experience adverse physical conditions. Among them, nine workers suffered from heat-related illnesses (such as heatstroke and dehydration) this year. However, three-quarters of the workers polled had never attended seminars or training sessions on preventing heat-related illnesses and were unfamiliar with proper approaches to handling such health issues. Interviewed workers mentioned

that dizziness, headaches, nausea, and decreased appetite were common occurrences under the intense sun. Some even experienced heatstroke multiple times this year. Despite feeling unwell, workers often refrain from taking sick leave due to concerns about salary deductions.

In the study 'Sanitation Workers' Working Condition at Refuse Collection Points (RCPs) in Extreme Heat', over two-thirds (67%) frequently felt physically unwell while working at RCPs. Among them, two-thirds (66%) associated the discomfort with the stuffy, humid and poorly ventilated environment, highlighting the severity of the issue.

The long-term impacts and health risks of working in high-temperature environments, including an increased risk of heat-related illnesses, cannot be underestimated. Heatstroke occurs when one is exposed to sweltering conditions for a prolonged period of time, and the body is unable to cool down. Its symptoms include heat rash, heat syncope, heat cramps and heat exhaustion. Several studies also indicated that outdoor workers exposed to prolonged extreme heat might have reduced concentration, weakened physical strength, and are more at risk of heat-related illnesses, including heat stroke, as well as fatigue, dehydration, kidney diseases, cardiovascular diseases, respiratory distress, or respiratory diseases. In severe cases, these conditions can even be fatal.

Case 1:
Ms. Tang (46 years old)
Main Duty: Work inside RCP (including cleaning RCP, handling waste and refuse, operating refuse compactor, and cleaning toilets inside RCP)

Ms. Tang works ten hours a day (including a one-hour lunch break) inside an RCP. Despite having industrial fans, the environment remains extremely stuffy: 'There are no ventilation fans inside the station, and even with industrial fans, they do not face us. During work, we have to walk around, so we can hardly feel any cool breeze.' Ms. Tang spends at least ten hours each day in this very humid RCP, including breaks and lunchtime. She continued

by telling us how exhausting it is to work continuously for several hours, 'I sweat buckets at feel extremely tired at work. I don't even feel hungry because I lose my appetite from exhaustion.'

Case 2:
Fong (55 years old)
Main Duty: Street sweeping

Fong deliberately avoids entering the RCP outside of lunch hours: 'It's very hot inside, even with five or six fans, it still feels stuffy and stinky.' Worse still, not only can Fong not rest properly inside the RCP, but she also had some of her belongings stolen there in the past. 'Even my mug was stolen!' All of this has forced Fong to rest outdoors, which puts her at risk of receiving complaints. She expressed her helplessness, saying, 'I have no choice, and I can't think of a better way around that.'

Community Adaptation Actions

In response to the climate challenges faced by cleaners in their work environments, Oxfam Hong Kong has taken action at two levels: proposing policy improvements and providing direct support to help cleaners cope with high temperatures.

Policy-level Measures

- **Require contractors to provide heat-resistant equipment to workers**

Currently, the 'Guidance Note on Prevention of Heat Stroke at Work' does not include equipment for outdoor workers to handle extreme weather. This results in numerous outdoor workers having to personally prepare or buy heat-resistant or cooling equipment. Therefore, we suggest that the government should include heat-resistant equipment (including portable fans, arm sleeves, towels/cooling towels, wide-brimmed hats, etc.) in the guidelines and require contractors providing cleaning services to the government to distribute the aforementioned equipment to cleaners. This would enhance the cleaners'

‘climate adaptability’, reducing the likelihood of heat-related illnesses under extremely hot weather.

- **Establish rest arrangements for very hot weather, using objective criteria to safeguard workers' health**

We at Oxfam Hong Kong published it’s the ‘Impacts of extreme heat on street cleaners’ report’ last year. Since then, we have been urging the government to establish a heat index or other objective standards to indicate when work should be stopped in extreme heat to reduce workers’ risk of suffering from heat stroke. Oxfam Hong Kong believes that such an index should consider not only temperature but also other factors like humidity and air ventilation, indoor temperature and such into evaluation.

Authorities should not only include rest periods in the guidelines in rest periods but also incorporate relevant rest arrangements in contracts to comprehensively protect employees' occupational health and rights. If contractors refuse to allow employees to rest or stop work when certain standards of the index are reached, they not only face the risk of penalties but also scoring deductions, impacting their chances of winning future contracts.

- **Review the Employment Ordinance and add paid sick leave**

Even if grassroots cleaners feel unwell due to heat-related illnesses, they often persist in working out of fear of income loss. According to the Employment Ordinance, employees are entitled to receive a ‘sickness allowance’ of four-fifths of their daily wage only if they take sick leave for no less than four consecutive days with a doctor's certificate and recommendation. For fewer than four days, there is no allowance. Consequently, if a worker takes sick leave due to heat-related illnesses, it is equivalent to a wage deduction. This leads many outsourced workers to continue working despite feeling unwell to sustain their livelihood without interruptions.

Acknowledging this, Oxfam Hong Kong is also urging the government to incorporate safeguards for paid sick leave for outsourced cleaners into the outsourcing service tendering system. Even for sick leave of less than four consecutive days, workers should still receive sickness allowances of no less

than four-fifths of their daily wage. This would systemically protect workers' health and enhance their climate adaptability.

Direct Support for Cleaners

- **Distribute neck-hanging fans to outsourced cleaning workers**

Oxfam Hong Kong has observed that outdoor cleaning workers often need to purchase cooling equipment on their own. Therefore, in August last year, when Hong Kong was experiencing prolonged high temperatures, we collaborated with the Hong Kong Catholic Commission for Labour Affairs and the Cleaning Workers' Union to distribute portable fans to over 4,000 cleaning workers. These fans could be worn around the neck or waist, providing some relief in the scorching work environment.

Outcomes

Incorporated the 'Guidance Notes on Prevention of Heat Stroke at Work' into the tender documents

According to our 2021 'Impacts of extreme heat on street cleaners' report', there were only four circumstances in which contractors would receive score deductions under the outsourcing service assessment scheme: violation of the minimum wage level, exceeding the daily working hours limit, failing to sign a standard employment contract with non-skilled workers, and not fulfilling the contractual obligation to pay wages to non-skilled workers through auto-transfer. Hence, we recommended that the government incorporate the 'Guidance Notes on Prevention of Heat Stroke at Work' into tender contracts and include them in the score deduction system to enhance the deterrent effect against non-compliance and ensure that contractors account for these costs before the bidding process.

Subsequently, we send letters to various government departments, including the Leisure and Cultural Services Department (LCSD), the Housing Department, and the Food and Environmental Hygiene Department (FEHD), which employ a substantial number of outsourced workers. We urged them to incorporate relevant guidelines into contract terms to ensure the safety of outdoor cleaning workers. In May 2022, a written response was received from the LCSD, expressing their intention to include appropriate clauses concerning the working arrangements of outdoor cleaning workers during very hot weather in the forthcoming outsourcing contract documents. Oxfam Hong Kong welcomed their response. We also hope that the Housing Department and FEHD will undertake similar commitments to include the relevant guidelines in their tender documents.

Introducing heat stress warning and rest arrangements

Oxfam Hong Kong has consistently requested authorities to establish rest arrangements during very hot weather to safeguard the health of outdoor workers. Yet, the government has not directly addressed the issue. Their approach only involves offering subsidies for companies to purchase individual

cooling gear and encouraging employers and employees to jointly pay attention to the matter.

Seeing this, Oxfam Hong Kong proposed that the government refer to examples from different countries and cities to establish rest arrangements under very hot weather in Hong Kong in both our ‘Impacts of extreme heat on street cleaners’ report’ in 2021 and ‘Sanitation Workers’ Working Condition at Refuse Collection Points (RCPs) in Extreme Heat’ in 2022. This would provide objective criteria to protect the health of workers. We have also written to various government departments to urge them to address this issue promptly.

Following the report's release, there was widespread discussion in society about establishing rest arrangements in extreme heat. Many non-governmental organizations began paying attention to the issue, and some conducted similar studies, recommending that authorities quickly establish appropriate standards. In the 2022 Policy Address, the Chief Executive announced that the government would develop guidelines based on the Hong Kong Heat Index, mandating employers to adopt preventive measures based on specified criteria to prevent employees from heatstroke. The Labour Department also held a public hearing in December 2022 on this issue, inviting OXFAM and related trade unions to attend.

Ultimately, in May 2023, the Labour Department introduced the ‘Guidance Note on Prevention of Heat Stroke at Work’, specifying conditions for rest or cessation of work based on Hong Kong Heat Index and working intensity. These guidelines are applicable to jobs in very hot or high-temperature conditions, both outdoors and indoors without air conditioning. The warnings are categorised into three levels, namely yellow, red, and black. A yellow warning is issued when the Heat Index is over 30 but not exceeding 32; a red warning is issued when the index is above 32 but less than 34; a black warning is issued when the index is 34 or above. Rest and cessation arrangements differ according to job type.

Chapter 2.2: Hong Kong - Coping Strategies for Subdivided Flat Residents Under Extreme Weather Conditions

Background

People living in poverty are often more affected by extreme weather as a result of climate change, and subdivided flat residents are particularly vulnerable. These living spaces are extremely cramped, with an average living area of only 73 square feet (about 7 square meters) per person1. There is also poor air circulation, so heat is easily trapped indoors. Due to their low incomes, many residents choose to endure the heat rather than use air conditioners to save on electricity costs. Additionally, during typhoons or heavy rainstorms, these residents face risks of leaks and window damage.

According to the latest data, the number of subdivided housing units in Hong Kong has increased to 107,371 units in 2021, which is a 17% rise compared to 91,787 units in 2016. On average, each unit is split into 3.2 subdivided units, accommodating a total of 215,709 residents, which indicated a 2.8% increase from 209,740 residents recorded in 2016 2. However, due to the presence of subdivided units in industrial buildings, the government could hardly investigate. Hence, these numbers might not be able to fully reflect the actual situation and quantity of subdivided housing in Hong Kong.

Oxfam Hong Kong has always been concerned about the well-being and rights of subdivided housing residents. Acknowledging the adverse effects of extreme weather on these residents, Oxfam Hong Kong is assisting them in facing extreme weather conditions through direct support as well as policy initiatives.

Climate Adaptation and Climate Risks

Oxfam Hong Kong's 2021 research titled 'Impacts of extreme weather on subdivided flat residents' revealed that nearly 60% of the respondents were

[1] Page 37. https://www.census2021.gov.hk/doc/pub/21c-SDUs.pdf。

[2]https://www.censtatd.gov.hk/en/data/stat_report/product/B1120113/att/B11201132021XXXXB0100.pdf

dissatisfied with the ventilation in their residences and believed indoor temperatures within the subdivided units were higher than outdoors. About 20% of the interviewees lived in subdivided units without windows, resulting in poor air circulation and further heat accumulation. During the survey period, the research team measured temperatures inside and outside subdivided units, finding that almost half (45.5%) of the subdivided units were hotter than the streets, with a maximum temperature difference of up to 5.8°C. The highest recorded temperature inside a subdivided unit reached 35.1°C, nearly 6°C higher than the average temperature of Hong Kong that month (29.6°C).

While windows were lacking, poor air ventilation trapped hot air indoors, causing further increase of temperature during hot weather. Despite having air conditioning installed within the unit, tenants often only turn it on before they sleep, turn it off in the early morning, and use fans as an alternative to save on electricity costs. Some households mentioned that they would stay in nearby malls, supermarkets or libraries during noon to avoid the hottest part of the day. These survey results indicate that subdivided housing residents encounter severe challenges during extreme weather conditions, which needs the attention and support from both the government and society to offer a better housing environment and related safeguard measures. Subdivided housing residents are exposed to heightened risks during extreme weather, including issues regarding housing structure and impacts on their physical and mental well-being. However, due to many residents living below the poverty line, they have no choice but to face these problems.

In terms of housing structure, over a quarter of the surveyed residents indicated that typhoons or heavy rainstorms would impact their living spaces. More than 80% reported problems of wall leakage or water seepage, and nearly a quarter had their windows damaged. Interviews revealed that numerous landlords neglected maintenance responsibilities after renting out the units, leaving tenants to bear the costs of repairs when facilities are damaged, creating financial burdens for families.

We visited a subdivided unit in Kwai Chung, located on a rooftop, which is classified as an ‘unauthorised building work’, or an illegal structure. Residents mentioned that their residence would shake and water would leak in during

windy and rainy conditions, making it hard for them to fall asleep the entire night. In the worst case, they had no choice but to stay with relatives or friends for a few days to avoid the strong winds.

In addition to structural issues, heat also affects residents' physical and mental health. Almost 70% of respondents pointed out that their daily lives were impacted, mainly by worsened health, difficulty concentrating on studies or work, and increased mental stress. Two individuals experienced symptoms of heatstroke, and one person even suffered from heat-induced muscle cramps. Close to one-fourth of respondents stated they could not focus on reading or work.

Research also shows that a high-temperature environment is detrimental to children. Staying at home for a prolonged period could potentially lead to depression or mania, thereby affecting their growth. Additionally, children's eating, studying and sleeping are confined to narrow beds, often leading to clashes with parents. In interviews, some secondary school students living in subdivided units mentioned that they preferred going to malls to enjoy air conditioning after school and only returning home in the evening, which affected their academic performance.

Community Adaption Actions

In the Policy Address, the government announced the construction of 30,000 flats of Light Public Housing (LPH) over the next five years to improve the living environment of subdivided unit residents. While the conditions of LPH are considerably better than that of subdivided units, the limited quantity of 30,000 units falls short of meeting the demand of the 100,000 subdivided unit households across Hong Kong. Thus, the government must continue to intensify its efforts to address the needs of current subdivided flat residents and improve their living conditions under extreme weather.

In response to the impact of extreme weather on subdivided unit residents' lives, Oxfam Hong Kong interviewed university professors, social innovation designers, visual artists, and organisations concerned about subdivided flats to understand their thoughts on improving the environment in these units. As a

result, we propose the following recommendations to enhance the living environment of subdivided unit residents in terms of policy and action:

Policy-level Measures:

- **Urge authorities to assist residents in replacing and acquiring energy-efficient home appliances and other cooling facilities**

Survey findings suggest that subdivided unit residents are particularly concerned about electricity bills, which may lead to reluctance to keep air conditioning on for a long time even in hot environments. Furthermore, the energy efficiency of air conditioning is closely related to electricity costs. According to data from CLP Power, air conditioners with a Grade 1 energy label conserve 11% and 25% more electricity than those with Grade 3 and Grade 5 energy labels. Likewise, refrigerators with a Grade 1 energy label save 41% and 97% more electricity compared to those with Grade 3 and Grade 5 energy labels, which could significantly alleviate the electricity burden for residents of subdivided units.

Through interior design, indoor environments can also be enhanced to create a sense of space and facilitate air ventilation within limited spaces. We have

conducted in-depth interviews with interior designers who believe that adding storage space above the floor level of subdivided units (similar to platform designs) can temporarily store stuff previously placed inside the unit, thereby increasing indoor space. Simultaneously, insulation panels can help reduce indoor temperatures and improve the indoor environment.

The government initiated the 'Assistance Programme to Improve the Living Environment of Low-income Subdivided Unit Households' earlier. It aims to assist low-income subdivided unit residents in making simple home improvements, purchasing furniture and household items, receiving pest control services and basic repairs. Oxfam Hong Kong has suggested incorporating options such as energy label guidance, platform installations and easily installable insulation panels in the Assistance Programme. These could help tenants purchase energy-efficient appliances to improve the interior environment and temperature of subdivided units.

The programme ended in June 2022, but Oxfam Hong Kong believes that the government should extend its duration to allow more subdivided unit residents to have the opportunity to apply and enhance their living environment under extreme weather conditions.

- **Increase Community Shared Space and Services**

Currently, the issues faced by subdivided flat residents mainly include indoor overheating, poor ventilation, cluttered items and inadequate storage space. Not only do these problems create a sense of crowdedness in rooms, but they also impact the physical and mental well-being of residents. They increase the risk of heat-related illnesses and affect the growth and development of children. Thus, reducing rarely used items or appliances could help with enhancing the sense of space and promote indoor air circulation, leading to a better cooling effect.

Currently, communal spaces and sharing resources within communities have become a major trend. In compliance with relevant principles, the government should consider collaborating with voluntary groups or community organisations to establish shared spaces and share certain electric appliances/furniture facilities, such as washing machines, cooking equipment,

etc., to increase the sense of space in units. This simultaneously allows subdivided housing residents to build social networks, achieving a win-win situation. Besides, we also suggested opening schools after school hours as tutoring centres for underprivileged students living in subdivided housing, aiming to minimise the impact of the environment on their learning.

Directly Support to Subdivided Unit Households

- **Mini-storage Sharing Scheme**

Oxfam Hong Kong recently collaborated with a mini-storage company to launch a scheme that allows subdivided unit tenants to store some of their belongings in mini-storages temporarily for free. This scheme, which aims to increase their living space and improve their environment, has been well-received by many neighbours. The mini-storage company has extended the relevant duration to two years, allowing subdivided unit tenants to temporarily store seasonal stuff or other belongings in mini-storages during this period.

Outcomes

Government Explored Community Resources to Support Subdivided Flat Residents

Oxfam Hong Kong has always been concerned about the limited space in subdivided units. Thus, during the previously mentioned survey period, we actively reached out to scholars researching subdivided housing issues and former government officials with housing-related duties to collectively explore solutions. They generally agree that the principle of ‘sharing’ could increase space within units and help address extreme-weather-related challenges.

Therefore, after the release of survey results, Oxfam Hong Kong also contacted various people and departments in the government, including the Chief Executive, the Development Bureau, the Transport and Housing Bureau (now the Housing Bureau), and the Lands Department. We hope they will take our advice and establish communal spaces.

Recently, authorities indicated their plan to establish ‘community living rooms’ as a cross-sector effort to provide additional living space for subdivided flat residents in the meetings convened by the Commission on Poverty. This project

aims to expand their social networks, enhance their quality of life and foster a stronger sense of belonging to the community, which aligns with our principle of ‘sharing’. It is well-known that the space in subdivided units is limited. If there is excessive clutter, it can impede air circulation, causing the environment to be more stifling. Therefore, we suggest that community living rooms allow residents to share certain facilities, such as washing machines, cooking equipment and part of large furniture. This initiative could reduce facilities within units, thereby improving the environment, increasing unit space and promoting air ventilation. Concurrently, it could provide subdivided housing residents with a bigger and more comfortable resting space to take a break from cramped and stuffy conditions.

A one-year trial of ‘School-based After-school Learning and Support Programmes’ is introduced

We visited subdivided flats in Prince Edward and Sham Shui Po with our partners and found that due to limited space, students could only bend their knees in front of their desks to complete their homework in hot environments, which undoubtedly affects their learning performance.

However, after-school care services are now mainly organised by non-

governmental organisations (NGOs) and lack strong government leadership. At the same time, quotas are relatively limited, and students still need to travel to NGO-affiliated community centres after school, which might cause worries for parents. Therefore, we propose that schools offer homework assistance for underprivileged students living in subdivided units in our survey recommendations. We have also written to various government departments to urge them to address the learning rights of subdivided unit students.

Recently, the government announced launching the 'School-based After-school Learning and Support Programmes' in the upcoming school year. Schools will provide the venue, whereas NGOs will be responsible for its operation. This programme enables primary school students in need to stay at school after classes for care and learning support, allowing parents to go out and work and improve their lives. We hope the government can take the lead in inviting more schools to participate in the programme, ensuring long-term equal learning opportunities for subdivided unit students.

Set up Mini-storage Sharing Scheme to Enhance Living Space of Subdivided Flat Residents

We interviewed participants of the mini-storages sharing scheme, during which they stated that it reduced items stored at home. Not only did the programme reduce potential hazards, but it also increased available space, making it easier for them to cope with life changes. Some families initially applied to this scheme as they were expecting newborns, and after participating, they obtained more space to place the furniture required for caring for their babies. Overall, the programme effectively enhanced living space and quality of life for subdivided housing residents.

Chapter 2.3: Liugou Village, Shaanxi Province - The Road to Building a Green and Resilient Village Construction Through Adaptation and Mitigation

Background

Liugou Village is located in the southern part of Shaanxi Province, under the jurisdiction of Nanzheng County, Hanzhong City, Shaanxi Province; its highest point is 1,600 metres above sea level. It is the upstream of South–North water source protection zone in the Qinba Mountain Area. The total area of the village is 14,040 mu, including 3,447 mu of arable land. There are 6 village groups with 320 households (1,013 people) scattered in 30 mountain ridges and gullies. There is a thousand-mu tea garden in the village, which is rich in the famous tea Hanzhong Xianhao from southern Shaanxi, and is the main source of livelihood for the villagers. Liugou Village belongs to the Qinba Mountains, one of the 14 contiguously destitute areas in China. This area has high climate vulnerability and sensitivity, and its ability to adapt to climate change is weak. Against the backdrop of global warming, since the 1990s, Shaanxi has experienced significant warming and increased precipitation, leading to an increasing frequency of climate disasters.

Climate Risks

The monsoon climate in Liugou Village is characterised by springs with little rainfall, hot and rainy summers; cloudy and rainy autumns; and foggy and often gloomy winters. The village belongs to the monsoon-humid subtropical climate zone. Its annual precipitation is 800mm and the annual average temperature is 14.2°C. It is vulnerable to rainstorms and floods in summer all the year round. According to villagers' memories, in the early days of July 2012, there was continuous rainfall in Hanzhong, Shaanxi. On 9 July, an extremely heavy rainstorm hit, with a two-hour rainfall reaching 170mm. The branch and main streams of the Lengshui River exceeded the warning water level. A large flood came ashore and inundated houses and crops. The deepest sludge in the house met 2.9 metres. Liugou Village, Mujiaba Town, Nanzheng County, was the most severely affected village in this disaster.

Against the backdrop of global warming, the climate in Liugou Village has shown significant changes in the past 60 years. On the one hand, the trend of weather warming is more obvious, with frequent occurrences of extremely high temperature and a decrease in extremely low temperature weather. On the other hand, the risk of floods caused by server rainfall has been reduced, but the rainstorm floods in some years are still very serious while the risk of drought disasters is not prominent.

According to the simulation results of regional climate models, the heatwaves in Liugou Village will show a significantly increasing trend in the next 20 to 70 years, while the low temperature and cold damage will further lessen, with only a certain degree of outbreak in some years. Rainstorms and floods will have a fluctuating increase. The intensity of rainstorm will increase obviously. However, the increase in drought frequency is not significant, but its intensity will enhance.

Climate Adaptation

Facing the threat of frequent extreme climate events, the production and quality of tea in Liugou Village have been significantly affected, leading to the unstable income of the villagers. Meanwhile, most of the permanent residents in the village are left-behind women and elderly people, so their vulnerability under climate change are more pronounced. Overall, the current weaknesses of implementing climate adaptation in Liugou Village are mainly reflected in the following aspects: (1) disaster prevention and reduction facilities are weak in the village; (2) The monitoring and warning system is incomplete; (3) Infrastructure of tea gardens is weak; (4) the village lack of suitable tea tree species that can resist local stress; (5) The ecological environment needs improvement; (6) The place lacks of systematic tea tree cultivation and management techniques.

Community Adaption Actions

In order to strengthen the community's ability to cope with climate change and achieve green and low-carbon development, with the support of Oxfam, Shaanxi Volunteer Mothers Association for Environmental Protection has carried out actions to address climate change in Liugou Village since 2012. It successively implemented the emergency rescue after the rainstorm and flood on 9 July, post-disaster reconstruction, ecological village development and construction, and the second phase of ecological village construction, including disaster prevention and mitigation construction, infrastructure improvement, tea garden renovation, technical training, and capacity building. The plans have greatly boosted the community climate resilience, reduced carbon emissions, and improved the ecological environment of the community.

Setting up basic system of disaster reduction and prevention in village; improve ability of disaster reduction and prevention

Oxfam supports partners to intervene in disaster emergency rescue, mobilise villagers to actively participate in this work to protect themselves, improve villagers' production and living conditions, and enhance villagers' ability to prevent major damage and reduce the impact disasters has on them. Firstly, the transport infrastructure has improved and supporting of drainage ditches of 7,094m, sills of 71.4m, 56 culverts, a

concrete slab bridge, and 3,800m of hardened and repaired water-damaged roads were built in Liugou Village, which are convenient for villagers' travel and transportation. Secondly, five reservoirs were built, and 11,000m of pipe network were laid to provide 128 households with safe and clean water.

Thirdly, according to the villagers' living and geographical conditions, disaster prevention and reduction working groups have been established; 910m^2 emergency disaster avoidance activities with emergency disaster relief equipment have been built; more than 7,000m of drainage ditches has been set up; and a disaster early warning broadcast system has covered the entire village.

Advocating the integrated development of resilient villages and green industries to achieve rural revitalisation

Oxfam and its partners have been actively promoting the construction of ecological tea gardens, set up a 300-mu pilot tea garden for demonstration, facilitating green product certification and the registration of the green trademark 'Wahuatan'. In the process of constructing the ecological tea gardens, farmers are encouraged to use straw, human excrement, plant ash, and kitchen waste for organic composting to reduce and replace chemical fertilisers. Through biological and physical measures to reduce the use of pesticides, more than 300-mu of five relatively concentrated tea gardens were selected, with 54 households' participation, for building up a high standard ecological demonstration tea garden, in which 12 sets of solar insecticidal lamps and more than 10,000 hanging pest traps were set up to reduce and replace chemical pesticides. At the same time, a comprehensive green technology service was established, inviting agricultural technicians to provide 26 training sessions for villagers on tea planting, livestock and poultry breeding, benefiting over 1,200 people (visits). Also, nine 'soil experts' in the village were trained, and through regular sharing on production, they can together explore the green production experience, facilitate mutual assistance and learning among farmers to provide support for villagers to master the technology of standardised green production.

With introducing a pilot idea of applying the concept of 'carbon neutrality' in tea gardens, the first national 'carbon neutral' demonstration in rural communities represented by small farmers has been deployed. A team of experts has assessed the full production cycle of the tea plantation managed by the village cooperative and calculated the total greenhouse gas emissions from production to consumption. By achieving the target of carbon neutrality through the synergy of adaptation and mitigation measures, the brand certification of tea carbon neutrality can be promoted, the transformation and realisation of the ecological value of tea brands can also be improved.

Adaptation Measures in Liugou Village:

1. Preventions and responses to extreme climate events
    - Establish working groups of disaster prevention and reduction among village/group;
    - Build road drainage ditches, sills, culverts, and concrete slab bridges;
    - Build water tanks and set up water pipeline networks;
    - Build disaster refuge for emergency and equip them with survival equipment;
    - Establish a full-coverage disaster warning broadcast system.
2. Measures against climate change taken by the tea gardens
    - High temperatures and heat waves: arrange sunshade nets; irrigate the tea gardens to cool them down in the mornings and evenings;
    - Low temperatures and frost damages: breed anti-freezing tea tree species to oppose; timely use sprays to defrost and cover mulches/shading nets to resist frost; and prune the frozen tea trees in time after the temperature rises;
    - Rainstorms and floods: repair agricultural infrastructure such as tea garden roads, ditches, ridge steps, and pumping stations, etc; take chance to shallow plow and weed after heavy rains, open ditches and fertilise, till the soil in time after fertilisation; arrange insecticidal lamps, insect attractants and pest control palettes;

- Droughts: Renovate and improve the water conservancy facilities and irrigation system in the tea gardens; reduce the stress of drought on tea tree seedlings through farming measures to retain moisture; spray foliar fertilisers to boost root growth to improve drought resistance of the trees; enhance the biodiversity in the tea gardens, and improve its drought resistance.

3. Enhancement of livelihood security in the village
   - Establish tea farmers' cooperatives and brands to collaborate for better technology and boost the sales; meanwhile, collectively shouldered the climate and market risks for the tea farmers;
   - Extend the product chain of tea cultivation, production and processing, packaging, and sales, in order to reduce costs, expand the market, and ensure stable income;
   - Explore tourist opportunities of the tea gardens and other livelihoods.

From the mid of 2012 to the end of 2022, the amount of climate action funds invested in Liugou Village is approximately 5.2 million yuan (HKD5.69 million).
Major sources of funding include:

- Oxfam: 51.9%
- Self-financing by local government and villagers: 48.1%

Outcomes

Through nearly 10 years of efforts, the action has helped the village adapt to and mitigate climate change.

In terms of economic benefits, the adaptability of the tea gardens has been greatly improved through the fundamental infrastructure constructions and renovation in the community. Losses caused by increasingly frequent high temperatures, droughts, and heavy rains have been avoided to the greatest extent. The average annual loss has been reduced on average to more than 30% and the investment costs of the tea gardens have also reduced by 10%-20%.

In terms of ecological benefits, by measures of garbage classification, community environmental management, and four-in-one technology applied in the tea gardens, the ecological environment of communities and tea gardens has successively improved; the biodiversity has enhanced; and the emission reduction have been outstanding. The awareness to the ecological and environmental responsibility of the villagers has surged by over 68%. The number of fireflies has obviously increased. River water has been clear, and the number of small fish has multiplied. The ecological

value of the tea brand has been significantly improved, and its popularity has continued to expand, bringing about an increase in income.

In terms of social benefits, through the implementation of the project, the Liugou Village community has won a series of advanced titles such as '2017 Shaanxi Disaster Prevention and Mitigation Demonstration Community', '2019 Hanzhong Ecological Demonstration Village', and '2020 Hanzhong Ecological Tea Garden' which are awarded by the local government and recognized by community residents. At the same time, the project has helped create a linkage of interests between small farmers and new business entities within the village, explore a sustainably coordinated business development of primary, secondary, and tertiary industries, and accomplish in valuing of the traditional farming livelihoods of the famers. Climate action has always adhered to the principle of participation and continued to encourage villagers to participate in various related activities in person. The harvested results stimulated the endogenous motivation, cultural competence, and cohesion of the villagers.

Liugou Village, like most rural areas in China, is currently facing difficulties and challenges of the phenomenon of aging rural community workers. They have to think about how to transform the geographically advanced business into a profitable one through enhancing the tea brand value to attract more young people to return.

In the next step, the project team is planning to build water cellars and drip irrigation facilities in tea gardens to alleviate the impact of drought disasters. Meanwhile, the project will expand the promotion of the four-in-one ecological planting technology to further reduce carbon emissions in the tea garden planting process, and at the same time, to enhance the high temperature and drought resistance of tea trees. The construction of Photovoltaic power generation equipment will be explored to accomplish the mission of substituting clean energy for traditional energy, reducing carbon emissions from the small tea workshops, and making zero emissions in the entire chain of tea production. Through these actions, not only the local ecological environment will improve, but the people will benefit from it. The diversity of local villagers' livelihoods and their resilience to climate change adaptation will be enhanced.

The story of Liu Juan, a villager in Liugou Village

Liu Juan is the mother of an 11-year-old child, and one of the few young people who insists to stay in Liugou Village. She and her husband contracted 10 mu of tea gardens in the village and opened a family tea-making workshop at the entrance of the village. In 2011, Liu was elected as the village cadre for women's affairs. During the day, she was busy with village public affairs and when she returned home in the evening, she collected and fried tea with her husband and parents-in-law. To ensure

the quality of the tea, the whole family usually had to stay up late to roast all freshly picked tea leaves collected at the same day and let tea merchants collect by the next morning for the sales over the country.

However, their peaceful life was interrupted by a torrential rain that had not happened in 60 years. In 2012, the '7.9 Flood' destroyed the roads, houses, and tea gardens of the village. Liu Juan's family, who lives along the Lengshui River, was one of the most severely affected farmers. 'The flood drowned the entire house. The water level was as high as a person. The silt filled the whole yard. Over 3,500kg of freshly roasted tea were washed away. Furniture and electrical appliances bought during the wedding were washed away. Everything has been soaked.' The scene of the past has been clearly presented in front of Liu, and she said: 'In recent years, there have been more and more heavy rains in the village, and the flood season has also been significantly advanced and extended, and each time it caused large-scale floods. A major flood just happened on 1 April this year (2023). This may be caused by climate change!'

After suffering heavy losses, Liu repaired her house with the mutual help of her fellow villagers and re-opened the tea-making workshop by borrowing money from relatives and friends and applying for a loan from the Rural Credit Cooperative. After more than two years of hard work, the workshop is back on track. As the only female cadre in the village, Liu has actively participated in the reconstruction project and was selected by the villagers as a member of the project management team.

She tirelessly contacted the contractors for the bricks, sand and other materials needed to build the roads, drainage ditches and bridges in the village. She gathered villagers with cars to transport the materials to minimize project costs. During the entire reconstruction project, Liu not only participated in the whole process, but also took the initiative to organize the villagers to work together to complete all the infrastructure work. To motivate the development of the local agricultural industry, the task force mobilised villagers to start planting organic tea, and invited experts to guide and test bio-composting for reducing the use of chemical fertilisers and pesticides. Liu Juan and Captain Huang, the leader of the village group, also helped gather villagers to study, mobilise all villagers to join in this process, and make suggestions for the development of the whole village. The project encouraged villagers to adopt bio-fertilisers and biological method for pest-control, which could not only reduce soil pollution from chemical fertilisers and pesticides, but also reduce greenhouse gas emissions and contribute to mitigating climate change.

After the reconstruction, Liugou Village is full of vitality and hope. Liu Juan's family, by their own hard work and the guidance from the external, has gradually getting back to the road of getting rich from having nothing after the disaster. She said, before, she only had focused on her family and the work at hand, but after participating in the whole process of the project, she began to actively think about the industrial and community development, and cultural inheritance of the whole village. Liu said: ‘I am very glad to participate in Oxfam's post-disaster reconstruction project. During this process, I not only learnt a lot of knowledge, but also at the same time built my own home and managed my small home well.’

Chapter 2.4: Jiatang Grassland, Qinghai Province - Exploring the Path to Community Development Against the Backdrop of Climate Change

Background

Jiatang Grassland is within the Sanjiangyuan National Nature Reserve. The Za Qu River originates from the southern foot of Bayan Har Mountain and flows through Jiatang. After entering Sichuan, it becomes Ya Long River, the largest tributary of Jinsha River. It is also a major water source and tributary that covers the upper stretches of the Yangtze River. On both sides of the river are open plateau meadows breeding rich flora and fauna resources. At the same time, Jiatang Grassland is also where the life of herders coheres. The nomadic culture carries the livelihood and beliefs of local communities.

From the perspective of administrative division, Jiatang Grassland belongs to Zhenqin Town, Chindu County, Yushu Tibetan Autonomous Prefecture, Qinghai Province, and is mainly Tibetan. Among them, Zhenqin Ercun, where Jiatang Reserve is suituated, covers an area of about 160 km² and is divided into 5 communities accommodating a total number of 340 households with 1,362 people. Zhenqin Town purely relies on animal husbandry raising Tibetan sheep, yaks, horses, etc.

The village relies on animal husbandry and government subsidies as its main sources of economic income. In 2019, the per capita annual income of the village was 2,100 yuan, which is relatively low among the jurisdiction of Chindu County. Jiatang shares pastures with communities as a unit and implements seasonal rotational grazing. The pastures are transferred two to four times a year according to the seasons. In terms of public services, there is a primary school and a kindergarten in the village. The whole town shares one central health centre while there are no medical and health facilities in the village. The transportation is relatively convenient. It is about 17km away from the national highway and about 38km away from Zhenqin Town. The roads in the village are paved with hard materials.

Zhenqin Town is a pure animal husbandry community with a relatively low-income level. There are certain low-income and special groups in the community that need attention and help. Due to the influence of traditional concepts, some women have lower levels of education, employment opportunities and income levels. In addition, women bear heavy housework and childcare tasks in the family. In order to improve the living conditions of the low-income and special groups, the local government has taken certain measures, such as distributing bailout and carrying out poverty alleviation work. The implementation of these measures has improved the living conditions of low-

income groups and special groups in the community to a certain extent and facilitated the social development and progress.

Climate Risks

The risks of climate change in the Jiatang region are more prominently reflected in snow disasters, grassland degradation and wetland loss.

Snow disasters — climate disasters caused by extreme weather events. With the arrival of a snowstorm, many livestock died of frostbite in the extreme weather or died of starvation due to the heavy snow cover and lack of edible grass. According to the local survey conducted by the Shanshui Nature Conservation Centre (hereinafter as 'Shanshui'), more than 50% of the households in the snow disaster in 2019 suffered a large number of deaths of cattle and sheep. The economic losses caused by extreme weather can push a family back into poverty overnight, and communities do not yet have scientific solutions to cope with such problems.

The frequent occurrence of extreme weather is a significant characteristic of climate change. In the traditional knowledge of herders, major snow disasters happen in a gap of more than ten years between one and another. Luoluo, a herders in Jiatang: 'Let's say, if it snows heavily this year, causing many deaths of livestock, we will believe that there would be no more snow disasters in the next ten years. However, now snow disasters happen every two or three years. I think this is related a lot to the rain and snow (climate change).'

Grassland degradation — In addition to more frequent extreme weather, Jiatang Grassland has experienced uneven rainfall in recent years, leading to grassland degradation. The uneven rainfall, coupled with meteorological phenomena such as strong winds and heavy precipitation, denuded the surface of the nutrient soil, leading to grassland desertification or soil erosion, great reduction of water conservation of the plateau alpine meadows, mitigation of overland runoff, climate regulation and malfunctions of other ecosystem services. The regulating mechanism of the already fragile grassland ecosystem has failed. According to statistics, from 2000 to 2016, 25.6% of the land within the Jiatang Protected Area suffered moderate grassland degradation; and 32.93% suffered mild grassland degradation, in which a large area appeared in 'Heitutan' (black soil flat).

'Heitutan' is an original quality vacant pasture that barely covered. It is bald patched land with naked black soil (or covered by a single dicotyledonous species). It is all grass that cattle and sheep that cannot eat and there are many pika and mouse holes. The soil is so loose that feet will sink into when stepping on it. In autumn, these grasses

are all blown away by the wind. The ground remains black and sometimes then the wind is strong, the soil will also be blown away.

Wetland loss – In recent years, due to the interference of natural and human factors, especially the impact of global climate change, the alpine wetlands areas on the Qinghai-Tibet Plateau have decreased by 10%. In Jiatang Grassland, wetland loss has gradually emerged, and some wetlands have dried up due to insufficient rainfall in the growing season(s). The study found that wetland loss will cause changes in plant composition, and the changes will further aggravate the degradation of grasslands through hydrothermal cycles.

Climate Adaptation

Due to grassland degradation and quality wetland loss, herders say that livestock there do not have much meat on their bones, and do not produce as much milk. Coupled with more natural disasters, lots of snowfall happen in winter, leading to many deaths of livestock due to frostbite, or starvation due to heavy snowfall and lack of grass to eat. The livelihood and income of the herders has been facing great challenges.

Whether it is to find better pastures for grazing, or to go out to work to make up for the reduced income, more herders need to leave home and their community farther and for a longer time. It creates more difficulties to maintain and inherit the culture of the herder community, and the stability of their society.

To mitigate/eliminate these impacts, the following issues and challenges need to be addressed:

- Ecological protection: It is necessary to strengthen the protection and restoration of the ecological environment such as grasslands and wetlands; reduce environment damaging activities caused by humans.
- Development of animal husbandry: It is necessary to strengthen the technology and management of animal husbandry to improve its production efficiency and disaster resistance.
- Reactions to natural disasters: It is necessary to strengthen the monitoring of and responses to natural disasters; improve herdsmen's self-rescue and reacting capabilities.
- Protection of vulnerable groups: It is necessary to strengthen the protection and attention of vulnerable groups such as women, the elderly, children, and people with physical and mental disabilities, and enhance their living supports and self-development capabilities.

Community Adaption Actions

Since 2016, with the support of Oxfam, Shanshui has carried out a survey on climate vulnerability to learn about herder's perceptions of climate change, changes in agricultural and pastoral activities, and issues they might have regarding water. Through comprehensive analysis of local climate change and socio-economic data, a preliminary assessment on the vulnerability of the Sanjiangyuan area was conducted and key districts with high vulnerability were identified. Later in 2020, a survey on risks and reactions to climate change in Jiatang Grassland was made. Through questionnaires and interviews with the main stakeholders, we could understand how to implement changes more effectively. Meanwhile, Shanshui focused on ecological restoration, marketisation, government support, and capacity enhancement of community self-organisation. It analysed the roles of the government, communities, and NGOs, and proposed pathways for each party towards capacity-building for climate challenges. It also proposed policy recommendations through case reports and promoted knowledge and experience exchange through public communications. To face the challenges of climate change, Shanshui further facilitated the community to take climate actions, including grassland restoration, diversified livelihoods, etc, in hopes of enhancing the community resilience to the changing climate.

Adaptation Measures in Jiatong Grassland:

1. Risk assessment on climate change: investigated climate change adaptation strategies through questionnaires and interviews, explored herder's perception of climate change and adaptive behaviours, and evaluated trends, ecosystem changes, animal husbandry changes, community impacts, and adaptation measures of climate change.
2. Climate action workshop: Through discussions and interactions with local communities, we shared information about climate change to herders, shared climate risk assessment results, introduced alternative adaptation measures for Jiatang Grassland, collected opinions from the community, and together developed future adaptation measures and action plans.
3. Grassland restoration: Through discussions on the degradation degree, topography, precipitation, density of pikas and giant hawks, etc., reasonably selected restoration areas and restoration methods, then purchased grass seeds, fertilisers and tools, and launched the restoration involving herdsmen in the community.
4. Introduce sustainable grazing management system: Through sustainable grazing management training, introduced the principles to herders, and adopt scientific pasture management techniques (such as reasonable grazing, rotational grazing, grass retention, etc.) to strengthen the control and protection of the pastures.

5. Multi-livelihood activity: Helped 12 female members in the community to register a handicraft cooperative and invited external experts to provide trainings for cooperative members on product design, handicraft production and marketing.

From 2018 to the end of 2022, climate action funds invested in Jiatang Grassland was approximately: 5.64 million yuan (HKD 6.17 million). The main sources of the funds include:

- Oxfam: 16%
- Other foundations: 58%
- Government: 15%
- Corporate donation: 5%
- Public fundraising: 6%

Outcomes

The climate adaptation action in the community of Jiatang Grassland is still at the early stage of development, and it is hard to say that it has achieved solid and sound results. However, there has been some initial progress:

- 24 herders in the community participated in the preliminary climate action workshop and learnt about local climate risks and possible reactions.
- 276 herders in the community participated in the grassland restoration action. The participants showed very high enthusiasm and execution ability. They have implemented grass planting experiments on 300 mu of grassland. The experience will be reflected and referenced for the next stage of action.
- Eight key climate action leaders in the community have been identified, forming a team to discuss future actions.
- A handicraft cooperative involving 12 women has been formed, and a total of 382 pieces of handicraft products worth 29,462 yuan have been sold.

Climate actions taken in the community are expected to bring the following benefits in the future:

- Economic benefits: Grassland restoration and sustainable grazing management can increase the productivity and income of animal husbandry, and the income of communities. Multiple livelihoods can also increase the income of local families. At the same time, improving disaster resilience capabilities can reduce herder's losses when encountering extreme weather.
- Ecological benefits: Activities such as grassland restoration and sustainable grazing management can improve the grassland ecological environment, protect biodiversity, and reduce the risk of grassland degradation and land desertification.

- Social benefits: Project items such as risk assessment on climate change, climate action workshops and multiple livelihoods can raise community's awareness of climate change and adaptation, boost cooperation and communication in the community, and enhance the social cohesion. Livelihood supports and improvement has helped reduce the pressure on local women in family care. Through case studies and dissemination of information, the actions have raised the public understanding of the climate change impact on the Sanjiangyuan alpine ecosystem, drawing attention from all walks of life the alpine grassland degradation and its hazards.

The story of Yamasona, a herder from Jiatang

Sister Yamasona is the leader of a dance group on Jiatang Grassland. She is also the person in charge of the 'Dengjialacuo Professional Agriculture and Animal Husbandry Cooperative in Jiatang, Chingduo County. The organisation led the sisters to use yak wool produced in pastoral areas as raw materials to make handmade felt products.

Since 2017, Zhenqin Ercun, located on Jiatang Grassland, has embarked on the road of community protection and established a co-management committee while only a small number of people participated in it and the majority were men. During a herders study tour, Awu (form of address for Tibetan men) in the co-management committee learned that herders in other pastoral areas were developing characteristic handicrafts, and brought this news home. The ingenious women expressed that they wanted to try, but they could never find anyone who could lead them. At this time, the village committee recommended Yamasona, a skilful sister recognized in the village as 'who can knit sweaters and make Tibetan robes'. Therefore, the Shanshui staff went to visit Yamasona and started exploring and discussing about the handicraft group in Jiatang. Yamasona said she was willing to join and try to be a leader. In the following months, they visited several handicraft groups together to learn from the operation and development experiences. Finally, 16 women in the community formed a women's handicraft group, and unanimously approved Yamasona as the leader of the group.

After the women's handicraft group was established, Yamasona led everyone to formulate a management system. They tried to make some simple felt Tibeton foxes – iconic to the area – using yak down from the plateau. Through online tutorials and pictures of animals, the sisters began the exploratory learning on felt. However, due to different abilities and high technical difficulties, the Tibetan fox products always failed to meet the expected requirements, and the production reached a bottleneck. But Yamasona always encouraged everyone with an optimistic attitude while she

sighed sometimes. She would sing and joke for a while and was able to devote herself fully to it again.

In order for the women to receive more professional training, in the summer of 2022, Shanshui invited professional felt craft teachers from Hangzhou to teach in Jiatang. At the same time, they took the sisters to observe and learn from the local well developed handicraft cooperatives. In these activities, Yamasona has always played a leading role. She was the first to learn how to make a Tibetan fox and patiently provided guidance for other sisters. After a year of learning and training, their product quality gradually improved. The story of these women on the Jiatang grassland have been known. Their products have exported to Beijing, Hangzhou, and even across the ocean, at the venue of COP15, the International Conference on Biological Diversity in Montreal.

Although the work of handicraft development has been advancing and the progress is satisfying, self-organised handicraft groups could not directly receive financial returns, and they lack the legal status and entity to negotiate for business cooperations when facing the market. Some ladies had no choices but to quit the handicraft group this year because they had to take care of the elderly and children at home because they had to do a lot of housework.

In response to this problem, the village suggested that women's handicraft groups setting up their own cooperatives and having a legal entity to operate independently, so that everyone can have a sense of stability. So Yamasona began to convene members of the women's group and their families to discuss the establishment of a cooperative. Finally, after several meetings and discussions, they overcame all difficulties and in the last month of 2022, a cooperative of agriculture and animal husbandry in Tengyal Latso, Chengdu Jintang was established. At present, the cooperative has 12 members, who are between their 60s and 90s. They are all women who have been working hard from the group. As of the end of 2022, 400 felt products produced by the cooperative have been sold in the market, with an estimated revenue of more than 30,000 yuan, and they plan to contribute a certain amount for community social affairs in the Jiatang Protected Area. Next, Yamasona and her sisters plan to learn how to make more handicraft products and let more people know and pay attention to this place through cute animal felt dolls.

Although the sisters only took a short break from their busy housework to do something they loved, they used their actual actions to demonstrate the power of Tibetan women in pastoral areas. They commit their love for their hometown and their family, and use their hands that milk cows and produce butter to create the art and happiness.

Chapter 2.5: Wangjinzhuang Village, Hebei Province - Climate Change Adaptation Strategy: Plant 100 Types of Crops that Does Not Rely on the Weather

Background

Wangjinzhuang Village, located at the eastern foothills of the South Taihang Mountains in the deep limestone hills of Jingdian Town, She County, Handan City, Hebei Province, China. The area is characterised by tall mountains, steep slopes, thick rocks, thin soil and a shortage of water resources. The 800-year-old village consists of 1,432 households with a total population of 4,447, including 2,021 females. The village spans 3,189 mu with over 46,000 terraced fields distributed across 12 square kilometres, 24 large ravines and around 120 small ravines. They mainly cultivated millet, corn, beans, and Sichuan peppercorns. Due to the geographical location and climatic conditions of Wangjinzhuang Village, villagers' harvest is destined to depend on the weather. Their staple grains are mainly millet, rice, and flour, while rice and flour purchased from the local market. The annual per capita income of Wangjinzhuang villagers is approximately 8,100 yuan, with the major sources of income being wage labour out of the village and agricultural cultivation. Currently, many young villagers work outside, leaving the elderly and women as the main workforce within the village. Drinking water in Wangjinzhuang Village mainly comes from rainwater collection and bottled water purchased from the market. It has a primary school, a health clinic, and a grain and oil processing shop. Village roads are connected to the urban area of the county and the highway interchange, providing relatively convenient transportation links to the outside world.

Climate Risks

Wangjinzhuang Village experiences cold and dry winters, hot and rainy summers, as well as alternating cool and warm seasons in spring and autumn, meaning it falls within the dry sub-humid climatic zone. The village receives an annual rainfall of 540mm, whereas its average annual temperature is 12.4°C. The village is always prone to heavy precipitation and subsequent flooding in summer. According to the villagers, from 1 to 10 August 1963, Wangjinzhuang

endured ten continuous days of heavy downpours, which submerged 135 mu of farmland. From 1 to 4 August 1996, another intense rainfall event resulted in the destruction of over 120 houses along the main ravine, the collapse of more than 200 houses; several donkeys were also carried away by the flood. On 19 July 2016, torrential rain and flooding caused road damage, submerged multiple vehicles and led to the collapse of houses. In July 2019, floods struck again, submerging a large area of farmland and severely disrupting agricultural production for the villagers. In 2021, Wangjinzhuang experienced heavy rain again, leading to lower crop yields.

Apart from the increasingly frequent sudden floods, droughts and low temperatures have also begun to emerge. In 2019, Wangjinzhuang Village encountered a severe drought that only occurred once in a decade, causing agricultural yields to plummet to 25% to 30% of previous years, significantly impacting farmers' confidence in cultivation. In 2022, the prolonged period of low temperatures caused a substantial reduction in the yield of beans cultivated by the villagers.

Climate Adaptation

Continuous years of sudden extreme weather conditions including heavy rain, flooding, drought, and low temperatures, have caused great instability in terms of agricultural income of the villagers of Wangjinzhuang over the past several years. Villagers have lost confidence in depending on farming to improve their lives and meet their survival needs. Moreover, the majority of the residents in the village are left-behind women and elderly, whose ability and flexibility to cope with climate change are relatively weak. In their daily lives, they face substantial pressure and risks.

Community Adaptation Actions

In order to enhance the resilience of the community's livelihoods, with the support of OHK, the Farmers' Seed Network (FSN) started to establish farmer field schools in 2019. These schools help villagers learn about selectively breeding local, traditional and diverse seeds, strengthening local farmers' seed systems, and promoting community-based agricultural biodiversity

conservation and sustainable utilisation. Additionally, they have organised multiple trips for villagers to go out for exchanges and learnings, thereby enhancing the community's self-organising and cooperation among villagers, ultimately improving the village's climate change adaptation ability.

Digging into High-quality, Local Resources and Traditional Agricultural Wisdom

In coordination with the Terraced Fields Protection and Utilisation Association of She County (the self-organisation of the Wangjinzhuang community, referred to as the Terraced Fields Association in the following), FSN conducted a baseline study of community agricultural biodiversity in the early stages. They discovered that Wangjinzhuang Village still retains an intact traditional farming cultural system, which encompasses the survival wisdom of 'Planting a hundred types of crops in the land to not rely on the weather'. This sustainable way of survival involves 'the people storing seeds, the ground storing grains, the storehouses storing stock and the mouths saving food'. This agricultural knowledge has been practiced for more than 700 years.

Enhancing Climate Resilience by a Diversified Local Seed System

After the project team, composed of the FSN and the Terraced Fields Association, conducted preliminary baseline research and participatory interviews, Wangjinzhuang villagers' efforts in the preservation of farm varieties gained external attention and recognition. This, in turn, inspired more villagers, especially female representatives, to show interest in local traditional seeds and participate actively. They formed seed inventory team to compile inventory the community's crop genetic resources. With technical support from the Ministry of Agricultural and Rural Affairs of She County, Hebei Province, the project team assisted villagers in establishing a community seed bank. They tested and identified the traditional varieties, put efforts to purification and revitalisation, introduced ecological breeding experiments, and undertaking seed field trial plantation for 171 local traditional species. To strengthen cooperation and assistance among villagers and with the outside world, the FSN, with support from OHK, assisted the Terraced Fields Association in organising community seed farmers' markets and from-seed-to-table local food system public events. These have laid the foundation for the sustainable development of local seeds and agricultural products.

Adaptation Measures in Wangjinzhuang Village:

1. Inventorying Community Crop Genetic Resources: Established a women's seed inventory team to collect and register 171 local species within the village.
2. Establishing a Community Seed Bank: The 171 local varieties collected were categorised into 106 varieties, including 24 types of millet, 5 types of corn, 6 types of sorghum, 13 types of legumes, 6 types of radishes, 6 types of oilseeds, 6 types of tubers, 6 types of fruit vegetables, and 12 types of gourds. These local varieties are displayed in the 'Wangjinzhuang Community Seed Bank,' and a management mechanism has been collectively discussed.
3. Developing Species Identification: Confirmed different names for the same crop varieties by conducting species identification experiments.
4. Undertaking Seed Field Trials: Continuously selecting seeds adapted to the local climate to maintain their vitality.
5. Conducting Ecological Breeding Trials: Improving seed purity through purification and revitalisation, conducting local variety panicle purification and panicle nursery construction as the foundation for organic seed production.

6. Launching Seed Markets and the 'Wangjinzhuang Cultural Festival of Terraced Millet' Series of Activities: These events engage more villagers, rekindle memories of ancient flavours, enhance their capacity for crop diversity management, and improve the community's ability to adapt to climate change.
7. Organising Exchange Visits for Local Village Representatives: They visited various places such as Beijing, Inner Mongolia, Jiangsu, Yunnan, Guangxi, and Sichuan to share, exchange, learn, and connect with researchers, government representatives, consumers, social organisations, and other relevant interest groups.

Through capacity building related to community plant hereditary resources and both outbound and inbound exchanges, some families have started paying attention to the conservation of local varieties and consciously seek species that were once lost to rekindle memories of flavours from the past. Connecting seeds with food and culture stimulates the innovative abilities of women and young people and enhances community members' capacity for crop diversity management. It also promotes agricultural biodiversity, local dynamic conservation, and sustainable utilisation. The diversity of small-scale farmer seeds allows farmers to confidently replant short-growth-cycle local varieties, even in extreme weather, reducing agricultural cultivation losses and ensuring food security.

Funding and Sources:
From early 2019 to the end of 2022, approximately 2.14 million Chinese yuan has been invested in climate action in Wangjinzhuang Village. The main sources of funding include:

- OHK: 1.04 million yuan (48.6%)
- Local government agencies: 1.10 million yuan (for the hardware renovation of Wangjinzhuang Hongtuchang Primary School) (51.5%)

Outcomes

After four years of effort, the initiative has delivered some adaptation effects and benefits.

In terms of economic benefits, selecting a greater variety of crops reduces the risks of climate-related crop failures or yield reductions, thereby decreasing agricultural economic losses. Simultaneously, adopting ecological farming practices and collaborating with the Chengdu Ecological Agricultural Product Sales Platform to sell local farm products from Wangjinzhuang have diversified the livelihoods of farmers.

In ecological terms, the Wangjinzhuang Village conducted seed field trials on nearly 50 acres of terraced fields in Daojiaogou. By using ecological farming practices, the usage of pesticides and fertilisers is reduced, thus diminishing carbon emissions.

Regarding social benefits, the systematic collection, registration, and organisation of local varieties have consolidated and strengthened the Wangjinzhuang-centred rain-fed stone terrace farming system. Its effort in agricultural biodiversity enrichment and ecological functions contributed to the United Nations Food and Agriculture Organisation recognising the Wangjinzhuang rain-fed stone terrace farming system as a Globally Important Agricultural Heritage System (GIAHS) in May 2022. Villagers have participated in training activities multiple times and honed their capacity to manage agricultural biodiversity. The climate action initiative adheres to a participatory principle. The continuous effort to encourage villagers' active engagement in various community activities could foster intrinsic motivation, cultural confidence, and village cohesion. As a result, social benefits have significantly increased, and numerous global media have extensively covered Wangjinzhuang's efforts in seed conservation, such as traditional old varieties collection and census, seed banks and seed field trials.

Similar to many rural areas in China, the difficulty and challenge Wangjinzhuang Village currently faces is an ageing rural workforce and how to attract more youngsters returning by increasing the utilisation value of agricultural biodiversity. The project team's next steps involve restoring and expanding traditional old village wells to mitigate drought during spring planting and flooding during the summer. Combining traditional wisdom with science, an organic compost from donkey manure is made to promote circular agriculture. Seed trials will continue to aim for registering varieties and producing organic

seeds as soon as possible. Through these actions, the stability of the local rain-fed stone terrace farming system will be protected. Local villagers will benefit from the enhanced livelihood diversity and climate change adaptation resilience.

Wangjinzhuang Villager's Story

Liu Yurong, a young woman and mother of two who has returned to Wangjinzhuang, previously worked in Beijing. She returned to her hometown in 2016 to take care of her family and children. At the end of 2019, she joined the Terraced Fields Association, where her main responsibilities included managing the Wangjinzhuang Community Seed Bank and documenting the growth process of Wangjinzhuang's traditional crops.

Since joining the Terraced Fields Association, she increasingly realised the importance of seed conservation. She decided to reintroduce a local variety of small white beans that had been lost for eight years. In June 2019, the association organised its members to collect old varieties from over 1,000 farm households in Wangjinzhuang. Among the collected seeds, the small white beans, found in the home of an elderly resident on Third Street, were planted twice in Daojiaogou as an experiment in 2020 and 2021. Due to the old age of the seeds, however, none of them sprouted.

In 2021, Yurong visited an old man's home on Fifth Street and happened to discover that he still had small white beans from eight years ago. She proposed borrowing those seeds for another trial. Although the old man wanted to give them away for free, Yurong insisted on paying him, saying, "Seeds are valuable!" Since there were very few small white bean seeds, failing to grow them would mean the extinction of small white beans in Wangjinzhuang. Therefore, Yurong took extra care in planting them. After three consecutive cultivations and meticulous care, she finally successfully reintroduced the small white beans on the third try. From then on, the seeds of small white beans could be passed down and continued.

When asked, 'Why did you want to try growing small white beans?', she replied, 'To better understand small white beans and to preserve this old variety so that they can return to our tables and our children can enjoy them!'

The wide variety of beans in Wangjinzhuang provides the people here with essential nutrients such as protein, calcium, fat, and dietary fibre. These beans also enrich the soil of terraced fields with nitrogen, allowing the thin soil to grow abundant food, providing for the people of Wangjinzhuang who rely on the weather for their sustenance!

Chapter 2.6: Naxi Mountain, Jinsha River Basin Area - Climate Change Adaptation

Background

Shitoucheng Village is located in the dry-hot valley of the Jinsha River in Yulong County, Lijiang, Yunnan Province, more than 120km away from the city area of Lijiang. The village is a typical Naxi mountain community. It was named 'Shitoucheng Village' (which means 'Stone Village' in Chinese) because it was built on a mushroom-shaped boulder near the river. Shitoucheng Village has a history of more than 800 years. There are 1,247 households and 814 residents in the village, including 794 Naxi people. It is a Naxi mountain community that mainly focuses on agriculture. There are 1,026 mu of water terrace fields and 92 mu of dry farmlands in the village. The per capita cultivated land area is only 1.26 mu. Shitoucheng Village is rich in crops and produce varieties. The main crops include wheat, barley, corn, and potatoes, as well as wide varieties of local beans, vegetables and fruits. In recent years, young and middle-aged people working outside the village has become the main source of income for the villagers. Those left in the village are mainly women and the elderly.

The Yulong Snow Mountain and Jinsha River basin, where Shitoucheng Village is located, are areas with monsoon climate on plateaus in the southern temperate zone with unique mountain monsoon characteristics: there is a large height difference from the valley to the mountain top, and the climate has vertical differences. From the valley to the mountain top, there are levels of temperature distributions from warmth, little warmth, and coolness appearing in sequence. The valley area has a higher temperature, making it suitable for planting vegetables and heat-resistant crops. Areas between 1,600m and 1,800m are suitable for planting rice and corn, while areas above 2,000m are suitable for planting cold tolerant crops such as potatoes.

Climate Risks

The northwest region of Yunnan where Lijiang is located belongs to a cold climate, with long winters without summers and short springs and autumns. The average annual precipitation in the local area is 972 mm, and the average annual temperature is 12.6°C. Affected by monsoon climate in the uniquely low latitude plateau of Yunnan, Lijiang has a rainy season from May to October each year (commonly known as spring), and a dry season from November to April the following year (commonly known as late autumn). According to the data released by scientific monitoring and research in 2021, the temperature changes in the Lijiang area have shown an extremely significant upward trend in the past 60 years: the average temperature increased by about 1.41°C from 1960 to 2019, and the warming began to be more significant after

the 1990s, with the most prominent warming occurring after 2010. In terms of precipitation, the annual precipitation in Lijiang decreased by about 16.2mm between 1960 and 2019, which is not a significant downward trend.

The warming trend that villagers have been able to perceive in the past decade is consistent with the results mentioned above. In a series of surveys launched by institutions such as the Farmers' Seed Network (FSN) in 2013, villagers all reported that there was a local saying of ‘nine year drought in a decade’. In terms of rainfall, villagers generally said there was a trend of the delaying rainy season arrival. The early summer from May to June was the transition period between dry and wet seasons in Shitoucheng Village, which was a key time for planting spring crops. The arrival of the rainy season had a significant impact on crop sowing, growth, and yield in the later stages, especially in mountainous agriculture sensitive to weather changes.

Faced with climate change, villagers spontaneously made their own adaptive choice to switch traditional rice to corn. However, most of the corn varieties planted by villagers were hybrid ones that needed to be applied together with chemical inputs such as fertilisers, pesticides, and herbicides. Although those chemicals increased crop yields, it damaged the soil quality and ecological environment of the terraced fields. With the adjustment of planting structure, the rice farming and knowledge about traditional farming that the villagers had previously retained gradually disappeared.

Climate Adaptation

In order to cope with the dry weather brought by warming, Shitoucheng villagers changed traditional rice cultivation in spring to corn cultivation that required less water, and was more drought-tolerant and labour-saving. Planting corn made the application of pesticides and fertilisers, reducing the farming varieties retained by villagers. It also reduced the biodiversity in the terraces, destroyed the ecosystem, and brought food health problems to the villagers.

Community Adaptation Actions

With the overall goal of ‘comprehensive protection and utilisation of ecological and cultural diversity to enhance community livelihoods and adaptive resilience’, the community set up actual paths and targets to empower their adaptation ability, such as strengthening the farmers' seed system by breeding climate-adaptive varieties, promoting low-input ecological agriculture, scrutinising local ecological and cultural knowledge, and enhancing the ability of organisations and collective management of natural resources etc. With the support of the FSN, villagers also participated in

outings and exchanges in different themes to expand their horizons and build confidence.

Protect farming varieties and promoting ecological agriculture to reduce communities' use and dependence on high-carbon input resources

With the joint support of the FSN, Kunming Institute of Botany, Chinese Academy of Sciences, Guangxi Academy of Agricultural Sciences, Yunnan Agricultural University and other institutions, Shitoucheng Village established a participatory breeding selection group to collect seeds and organise information on local farming variety resources. A community seed bank was established on this basis, saving a total of 294 crop varieties like corn, wheat, beans, etc. At the same time, the breeding experts and villagers carried out adaptive improvement experimentation with various crops to modify and cultivate four drought-resistant corn varieties.

In addition to protecting plant diversity and cultivating climate-adaptive farming varieties, Shitoucheng Village also promoted ecological agricultural methods and encouraged villagers to reduce the chemical inputs such as pesticides and herbicides and use small-scale weeder suitable for mountainous areas instead. Moreover, field technical trainings on ecological methods of controlling pests and diseases were also organised, indicating villagers have mastered the technology and knowledge of ecological agriculture.

Scrutinising the local ecological and cultural knowledge centred on the irrigation system and enhance the cultural confidence of the community.

Starting from the public management of natural resources such as agriculture, water, land, and forests, Oxfam supported the community in improving the collective co-management systems to enhance their resilience. With the support of Oxfam and FSN, Shitoucheng Village participatory breeding team started a local irrigation system 'open ditches and underdrains' and its management mechanism, and documented and presented for public reference. The irrigation system of Shitoucheng Village is local wisdom in efficiently utilising water resources to cope with weather changes such as drought. Through the water resources co-management mechanism based on the core of the village's rules and regulations, villagers can allocate irrigation water in a timely and reasonable manner depending on the drought and crop sowing conditions of the year. Thus, the effects of extreme weather on agriculture can be diminished.

This knowledge achievement reflected the resources from local Shitoucheng Village's wisdom in response to climate change. It provides a strong reference value for other communities in the Jinsha River Basin and also an important perspective for the outside world to understand climate adaptation measures in this region.

From 2016 to the end of 2022, the amount of climate action funds invested in Shitoucheng Village is approximately: 1.5 million yuan (HKD1.64 million). The main sources of funds include:

- Oxfam: 67%
- Other foundations: 33%
- Government: None
- Corporate donation: None
- Villagers raise their own funds: None

Outcomes

Achievements: Shitoucheng Village has improved the protection and utilisation of local farm species, established an active protection mechanism including resource registration, community seed bank, seed fields, etc. Many female breeding experts have emerged; villagers' awareness and ability on protecting agricultural biodiversity has improved; corn, soybean and other varieties adapted to the local climate has been selected and cultivated. After nearly ten years of hard work, Guinuo 2006 (a type of lychee) and an improved corn variety have now become the most common crops in Shitoucheng Village. With the spread of farming varieties, the village has greatly reduced the use of pesticides and herbicides, and the terrace ecosystem has been restored. In addition, the results of selective breeding in Shitoucheng Village have been exchanged and disseminated in other communities in the Jinsha River Basin, which has greatly enhanced the level of protection on the farming species in surrounding communities. Some farming knowledge and ecological and cultural wisdom related to local varieties have also been compiled.

Knowledge Achievements: During the local implementation, a platform for multi-stakeholders participation was built, and a participatory integrated action framework for ‘social-ecological-livelihood’ was developed. This framework incorporated the assessment and analysis tools for the community seed system, and the practical guidance of agricultural ecosystem recovering from impacts of climate change. The villagers used these tools and methods to summarise and publish case manuals such as ‘Flowing Mountain Wisdom’ and ‘The Story of Sancun’ to assess and analyse the current situation, explore local adaptation measures and mechanisms in order to provide reference for other communities.

Policy Achievements: Shitoucheng Village, together with Labo Village and Youmi Village in the same drainage basin, became a demonstration for the project ‘Sustainable Livelihood and Green Development Strategy Research in Environment-economic Fragile Areas Along Silk Road (Sustainable Livelihood and Green

Development) by Chinese Academy of Sciences in 2018. In 2021, the case study of Shitoucheng Village and its Sancun was listed as one of the '100+ Global Typical Cases of Biodiversity'. It has been mentioned and disseminated many times at important international conferences such as the United Nations Framework Convention on Climate Change.

Since 2013, after nearly ten years of hard work, Shitoucheng Village has become the main line of seed biodiversity conservation through an 'active laboratory' mobilising the participation of the villagers and establishing collective management of natural resources. In this active experiment, the number of farming varieties, planting areas, and number of households in the community have been significantly increased in terms of the ecological perspective. The biodiversity in the farmland has also increased with the reduction of chemical inputs. From a social perspective, although the participatory breeding group focused on seed conservation and breeding, it also mobilised the participation of village organisations such as literary and artistic teams, women's groups, and elderly associations, thus expanding the scope of seed breeding work and enhancing the community's cultural confidence and cohesion. In addition, being an outstanding community case from the river basin, the pilot results of Shitoucheng Village have also led to the participation of other Naxi and Mosuo communities under the same river basin, realising the sharing and promotion of seeds and knowledge.

Zhang Xiuyun, the Story of Corn Mother

Zhang Xiuyun was born in Mingyin Township, Yulong County, Lijiang City, Yunnan Province, and later married to the Muniuke Natural Village in Shitoucheng Village. She is a crop breeder in Shitoucheng Village. Everyone calls her 'Corn Mother' because she has conserved more than 30 varieties of corn.

In 2013, Zhang Xiuyun participated in the FSN meeting held in Shitoucheng Village, where she was exposed to the seeds and stories of breeding experts from various places. She was inspired and has since embarked on the road of breeding and conservation. In 2014, corn varieties such as Guinuo 2006 and Guizongnuo jointly cultivated by breeders from the Guangxi Academy of Agricultural Sciences and farmers were introduced to Shitoucheng Village. She used the best 80% of her family's land for seed selection, breeding and production, and at the same time, she used previously preserved local corn seeds such as yellow corn, big horse teeth, and small white seeds for comparative experiments.

The climate in Shitoucheng Village has been unstable in recent years. Years of drought and delayed rainy seasons have affected the planting time and harvest of

crops. Zhang tried to combine the traditional Naxi planting methods with the selective breeding technology she had respond to the situations. After two to three years of field experiments, Zhang and her sisters from the Muniuke have improved corn seeds adapted to the local environment. The sowing time, germination rate, lodging resistance and taste can all meet their needs. They are also sharing these seeds with the nearby Naxi villages.

Zhang said: 'We have a lot of traditional corn seeds, such as big horse teeth, which are no longer available in many other places. We still retain them because they are related to our Naxi culture and the tributes of our sacrificial ceremonies - corn, wheat, and glutinous rice cakes. These three pieces are indispensable. They are passed down from our ancestors and cannot be thrown away through our hands.' She also said that her parents had kept a lot of old seeds in the past while planting only one species would be too monotonous. The more species you plant, the more flavours you can eat.

'Losing our seeds means losing our production and way of life.' Through seeds, Shitoucheng Village can combine the traditional wisdom of life and selective breeding technology to pass on the local ecological and cultural system, and the seed continuation requires the efforts and persistence of female breeders like Zhang Xiuyun.

Chapter 2.7: Baitadi District, Nepal - Women Work Together to Build a Climate Resilient Community

Background

Baitadi District is located in Sudurpashchim Province, the westernmost province of Nepal. It is one of the 77 administrative districts in Nepal. The administrative headquarter is located in Dasharathchand City. The district has an area of 1,519 km^2 and a population of 244,400. The main household income sources are from working abroad. Men work as seasonal workers in India, leaving women to farm (mainly wheat and potatoes) and raise animals (most families raise goat and cattle) to make more income. The average monthly household income is between 15,000 and 20,000 Nepalese rupees (i.e. HKD 900 to HKD 1,200). Communities in Baitadi District mainly eat their own crops, and there is also a tradition of exchanging harvests between farmers. They rely on nearby rivers for domestic water, and a few use tap water. People in the area mainly travel by walking, and there are a small number of buses that allow them to travel to other places outside the area. The communities of Baitadi District mainly believe in Hinduism and they go to local temples to worship.

Baitadi District is a mountainous area with an average annual temperature of 22.87°C, annual precipitation of 1,472mm, and annual rainfall days of 146.66 days. The monsoon season is from July to September every year.

Climate Risks

Although communities in Baitadi District did not feel a sudden increase in temperature, they generally feel that it is getting hotter year by year because they found more mosquitoes. Another obvious change is the increased frequency of extreme weather events compared to 10 years ago. The temperature and rain were more unstable and unpredictable than before. The rainstorm disaster happened only once every two to five years before, but now it has become more frequent. Increasing floods and landslides are causing greater damage. Dasharathchand and Mudap experienced a flood a few years ago, which not only caused losses to agricultural land and livestock, but also damaged the land near the forest area. In Kholi Khodpe and Patan, the entire community needed to be relocated due to flood risk.

In addition to temperature and rainfall increasing year by year and becoming more erratic, drought has also been increasing in some high-risk areas. Although the number of heavy rains has increased, the communities found that the precipitation has decreased as a whole, and droughts has even increased. They recalled that the local areas used to have snowfall every year, but now it only snows once every two to three

years. It has been observed that the water level of the local source has decreased or even dried up which has resulted in spending more time and travelling farther to the river to fetch water for drinking and irrigation.

Communities in the area feel that there have also been some changes in the monsoon, which has been delayed year by year and is gradually extending. During the monsoon season, the frequency of forest fires, crop diseases and pests, hailstorms, and strong winds has also increased, causing more crop and livestock losses, farmland damage, soil erosion, or even loss of life and injuries.

Climate Adaptation

Communities have noticed the current sowing period, and the harvesting time of wheat has been delayed by 15 days and by one month respectively, while comparing to 30 years ago. To adapt to the drastic climate change, they adjusted their cultivation plans, but still impacting on yield. On the other hand, the overall rainfall has decreased, while climate instability such as floods and droughts occur more frequently. In addition, the water and soil loss caused by floods and resulted in land degradation which led to a decrease of arable farming area and fertility. Overall, it has had a significant impact on the agricultural harvest to communities in the area, resulting in a decrease in agricultural income and a shortage of food. In order to compensate for household income and supplement food, more people (all men) are now migrant workers in India. Women stay in the village to take care of their families and also agricultural work, which greatly increases their pressure.

Community Adaptation Actions

To improve the climate resilience of communities in Baitadi District and their adaptability towards climate change, Oxfam and the local government have been working with the communities in following five areas:

Strengthening Disaster Prevention and Reduction Work

Actions have first focused on reducing the damages to farmlands and properties losses caused by unstable weather, heavy rains and floods. These include strengthening the early warning system and equipment, conducting drills, enhancing communities' awareness of disaster prevention and preparedness, and improving flood drainage pipes and upgrading infrastructure in the village, in order to improve the disaster preparedness.

Promoting Climate Resilient Agriculture

In terms of smallholder farmers livelihoods, we identified and replanted some local traditional seeds and crops (such as local legumes) that were climate resilient, such as flood, drought, and heat resistant. We made good use of the natural ability of the local crops to cope with the climate, conduct long-term active breeding, and leverage the characteristics of seeds in continuously adapting to the climate.

To enhance the soil fertility and crop resilience, we encouraged farmers to reduce the use of fertilisers and pesticides, which promote farmland biodiversity, and environmental ecosystem. The project also introduced green farming techniques such as polyhouse cultivation, drip irrigation, restoration of water tank, composting, use of biopesticide, and the allocation of diversified crop rotation, etc. which promoted the utilisation of local natural resources, improved soil quality, strengthened crop resistance to drought and unstable climate, and reduced the risk of a single type of crop under unstable climate conditions.

Protecting the Environment and Ecology

By raising communities' awareness of climate change, actions are taken to encourage them to pay attention to and protect their living environment and ecology, reduce waste, reduce the use and disposal of plastic and harmful materials, and restore natural resilience of the living environment and farmland ecology in response to climate uncertainty.

Diversifying Income Sources

Except for agricultural and pastoral income and working abroad, actions also included introducing mushroom and leaf-plate production, utilising local natural resources, expanding income sources, and diminishing the impact brought by climate change on residents' agricultural income.

Enhancing Mutual Assistance and Collaboration in the Community

Our intervention in Baitadi District encouraged participatory learning and joint actions, especially empowering women to support each other and unleash their potential, bear climate risks together, and share the economic benefits. Therefore, establishing women's groups and cooperatives as platforms and participating together have always been strengthened during the action process. Among the actions, special emphasis was placed on cultivating female leaders.

Adaptation measures in Baitadi District:

1. Strengthen disaster early warning system
2. Improve flood drainage pipes
3. Strengthen communities' awareness and ability to respond to disasters
4. Promote planting of local climate-resilient crops (such as legumes)
5. Improve farmers' farming tools and techniques
6. Pilot the polyhouse farming, drip irrigation and other technologies
7. Build water tanks to store rainwater
8. Reduce the use of pesticides
9. Promote the cultivation of mushrooms to diversify income
10. Promote leaf plate production, reduce plastics and increase income
11. Promote the circular economy and increase green jobs in social enterprises
12. Connect with local markets and promote agricultural products
13. Implement participatory learning and joint deliberations
14. Establish farmer field schools
15. Connect cooperatives and establish groups to farm
16. Promote women-friendly tools and techniques
17. The government invests in pilot projects to build 'climate smart villages'
18. Connect with civil society organisations for support

Funding and sources:

From 2021 to 2023 (until March 2023), approximately 48,442,212 Nepalese rupees (HKD2,893,800) have been invested in the project. Major sources of funding include:

- Oxfam: 96%
- Local government units: 4%

Outcomes

Increase in Communities' Awareness, Knowledge and Ability to React to Disaster Prevention, Climate Change and Environmental Protection

According to a pre-project survey, only 19.5% of the community members were aware of the impact of climate change on farming, while only 8.4% of them knew more than one coping method. Among them, 584 women were aware of the impact of climate change, and 381 women have obtained at least one coping technique. But as the project develops, communities are paying more attention to the situation and impacts of climate change, especially in building disaster preparedness and become more alert to the signs of the disasters. In terms of agricultural production farmers have adopted new technologies and built hardware such as water cellars, drip irrigation pipelines, and poly houses to grow vegetables. With more women in the communities, participated in agricultural training to adapt to climate change, adopted various means to react, developed more diversified planting plans to reduce the risks brought by climate instability and secure their agricultural income.

Increased Diversity in Communities' Income Sources, and Decreased Vulnerability

In addition to the corn and wheat residents grew in the past, women were encouraged to plant local legume varieties with stronger climate resilience able to cope with drought and unstable climate, ensuring agricultural income. At the same time, women's income sources are now more diverse, and communities are encouraged to start cultivating mushrooms. A cooperative using leaves to make plates has also been introduced to expand the source of income and reduce livelihood risks caused by climate change. The actions also encouraged communities to use leaf plates and cloth bags to reduce the disposal of plastic plates and bags, demonstrating the improvement of the local environment.

Women's Cooperation, Participation and Mutual Support

The most obvious and dazzling achievement of the project is the strengthening of individual empowerment and collaborative relationships among residents (especially women). Many women who participated in the project used to mainly take care of their families and their own farmland. Since the implementation of the project, a total of 20 women's empowerment centres (WEC) and 136 farmer field schools have been established in the local area, becoming an important platform for women to participate in the community and learn and grow. Women learnt new knowledge and concepts of management and business operations in the centres and field schools, organised cooperatives to implement business plans together and took actions to address climate change. Some women have become the president of the cooperatives, driving discussions and implementation of actions in meetings. In addition to numerous WECs,

the project has also established five small-scale seed production enterprises and five other social enterprises, promoting a diversified and green local economy. It has helped increase income and strengthen community relationships that have jointly shared risks and results.

Although we observed great progress and impacts from our project, women in the community agreed that more efforts should be put in water resource development and management in the future (including the construction of water cellars and the installation of water trucks). On the other hand, there are still many areas where farmers need to further improve their technology and tools in implementing green farming.

Case Stories from Baitadi Community

Deepa Panta

Deepa, a member of a WEC, lives in Dainseli village. She mainly grows vegetables such as potatoes as her main source of income. Deepa said: 'I am worried about climate change because it is happening every day.'

Climate change has made their lives difficult, and the climate has become unstable. Reduced rainfall and irregular rainy seasons make it difficult for her to plan when to sow seeds, plant and harvest. There have been more mosquitoes in the village and crops are prone to diseases, affecting their harvest.

WECs were established in different villages as platforms to teach the women about climate change. 'I didn't aware of the climate change before, but after receiving training from Oxfam, I knew the causes of climate change.' Deepa said. Oxfam's project promoted the causes of climate change and inspired the WEC members to take actions to protect their villages. Deepa and the WEC members are determined to influence other women in the village. Because of the local partner's network, they regularly go to radio programs in the village to promote knowledge about climate change and the importance of protecting the environment. Starting from them, waste segregation was implemented in the village to separate degradable waste from non-biodegradable waste. The use of plastic in the village was also reduced to lessen environmental damage.

The project has also taught them ways to cope with climate change, such as improving their farming tools and techniques, so that their incomes can be secured even under the impact of climate change. Deepa said: 'My income has increased. I can control my family's finances. In addition to maintaining daily living needs, I can

now save my income for emergencies.' Other than daily expenses, Deepa said money can be used for other purposes, such as children's learning expenses.

Heera Baht

Villagers living in Mudap were also affected by the extreme weather and their livelihoods were hit. Heera was in the same situation as most women in the village, their husbands are working in neighbouring country, India, while women stay in the village to take care of the farming affairs and the families. Due to the persistent drought in the area, Heera needed to walk an hour around the mountain to get water for daily uses and crops irrigation. Heera said: 'I am very worried about the current situation. I don't want my son to face the same predicament when he grows up. My child should not have to endure all this.'

Through Oxfam's project, she learnt different ways to grow different crops. The crops she grew in the past needed a lot of water, but now she mainly grows potatoes, and is using technologies such as greenhouse farming and drip irrigation to reduce water consumption and maintain her productivity. Despite the persistent drought, her income was maintained. Oxfam's project improved Heera's ability to cope with climate change and enhanced her understanding of it. She is now feeling confident and willing to continue to learn to cope with climate change. She will also share what she has learnt with the women in the village, hoping that all women in the village can increase their income.

Chapter 2.8: The Province of Eastern Samar, the Philippines - Three Fishing Villages Respond to More and Stronger Typhoons

Background

Located on the eastern coast of Central Philippines, Eastern Samar province faces the Philippine Sea to the east and Leyte Gulf to the south. The province has a population of approximately 460,000, distributed across 597 villages. The following climate action case study is from the Three Fishing Villages within the Eastern Samar province: Barangay Caridad, Barangay Malibago, and Barangay Dos.

The villages of Caridad and Malibago are in the southern town of Salcedo in the Eastern Samar province, while Dos village is in the northeastern corner of Dolores town in the Eastern Samar province. These three fishing villages are situated along rivers or the sea. Except Dos village, Caridad and Malibago are in proximity to town centers. The common features shared by these villages are their coastal locations, relative poverty, and frequent exposure to the impacts of typhoons.

Eastern Samar province follows the tropical rainforest climate. The average annual temperature is 27.76ºC, the climate is generally humid with no dry season. The period from November to January is noticeably the rainy season. Being located on the eastern coast of the Philippines, the province frequently faces very strong typhoons during the typhoon season, which typically occurs from July to November.

The local villagers primarily rely on fishing in rivers or in sea, and cultivate crops such as coconuts, copra, abaca, bananas, and pineapples. They also grow root crops and rice. Household incomes typically amount to less than 10,000 pesos per month (HKD 1,417). The main sources of food supply are fishery products and rice. Access to water relies on public faucets and water pumps, while some areas have household-level water supply systems in place.

Climate Risks

The local region faces the greatest climate risks which come from typhoons, heavy rainfall, and heatwaves. While precise data from the region are not available, interviews with local villagers from these three villages indicated that they have been

experiencing more frequent and increasingly powerful typhoons in recent years. The villagers consider this a significant signal of climate change that cannot be ignored. Despite living in coastal fishing villages on the eastern coast of the Philippines, the villagers are no strangers to typhoons. However, the consecutive onslaught of super typhoons ‘Haiyan’ and ‘Hagupit’ in 2013 and 2014 dealt a significant blow to the morale of the entire village community.

In addition to typhoons, villagers have also noticed an increase in rainfall from year to year. The villagers have been deeply impacted by the changing rainfall patterns, as there has been a noticeable rise in the frequency of devastating rainstorms in recent years, leading to more flooding and landslides, resulting in significant property damage and loss of lives. The heightened frequency and intensity of typhoons and heavy rainfall in recent years have caused great suffering for the villagers of the three fishing villages.

Abnormally high temperatures are also a noticeable aspect of climate change that villagers experience in their daily lives.

Climate Adaptation

For the villagers in the fishing village, the increasing frequency and intensity of typhoons have direct impacts, including the loss of properties such as boats, coconut trees, and even lives. In addition to these losses, a more widespread impact is the reduction in the number of days available for fishing throughout the year. Almira, a member of the Malibago village committee, said, ‘On regular days, my husband can earn about 3,000 pesos from a single fishing trip, but if there is a typhoon, it's probably only 500 to 800 pesos.’ They used to have four months in each year to harvest coconuts and earn a monthly income of 6,000 pesos, but after Typhoon Hagupit, they lost everything, and it took them three more years to have another harvest. Apart from the losses caused by typhoons, a more common situation is the overall decrease in average annual income for all households in the village.

The increase in typhoons and heavy rain has also led to changes in coastal landforms and soil erosion, resulting in more coconut trees falling. This has led to a decline in the production and quality of coconuts and related products, further affecting the income of the villagers.

In addition to the impact on income, typhoons and heavy rain have also damaged some houses and community facilities, including health centers and public halls.

Community Adaptation Actions

Oxfam and local NGO partner SIKAT have started speaking to villagers about climate change in recent years. On one hand, we aim to raise awareness among villagers about the potential impacts of climate change on their livelihoods and lives. At the same time, we hope to engage with the villagers in discussing sustainable adaptation strategies and put them into action.

Clearing and Maintaining Drainage Channels

In the early discussions, villagers noticed that garbage blockage was one of the reasons for flooding during heavy rains. After discussions among the villagers, supported by the project, waste segregation and recycling equipment were introduced in the village. Awareness building and educational work were carried out to encourage

villagers to change their improper waste disposal behavior and learn about waste segregation and recycling. As a result, not only did it reduce channel blockages but also improved the aesthetics of the village environment. The communities were reluctant during the initial operation of the garbage recycling system. Fortunately, through constant discussions among the villagers, more awareness building campaigns were carried out, and increased accessibility of the recycling facilities, the situation gradually improved. Through education and mobilisation of the villagers for recycling in the village, there has been a general increase in the shared awareness of caring for and conserving the environment. This shared awareness has laid a solid foundation for the next phase of climate action.

Mangroves as a Protective Barrier

By learning from experiences in other places, the villagers recognise that mangroves along the coastline and rivers within the village can serve as a buffer against flooding and storm surges. By protecting the fishing village from flood disasters, mangroves can also reduce erosion and soil loss. In fact, the village used to have a considerable number of mangroves, but due to an increase in severe typhoons, heavy rainfall, and human-induced environmental damage, many mangroves disappeared. After observation, the villagers believe in rehabilitation and even expanding the planting of mangroves to create a natural disaster barrier for the fishing villages. As the project continues, efforts are being made to support training for the villagers on how to plant mangroves and encourage collective participation in mangrove rehabilitation activities.

Adaptation measures in three fishing villages in Eastern Samar Province:

1. Observation, assessment, and education:
- Observing and recording climate change in the villages
- Promoting climate change knowledge among the villagers
- Assessing together with the villagers the impacts of climate change on their livelihoods and daily life, and considering possible responsive actions

2. Clearing waterways and drainage channels:
- Cleaning up garbage in the villages, channels, and waterways
- Implementing waste segregation and recycling facilities and management systems in the villages
- Conducting village-wide awareness and educational campaigns

3. Mangrove rehabilitation:
- Observing and discussing the importance of mangroves with the villagers

- Training villagers on mangroves rehabilitation and management
- Establishing a mangrove nursery and mobilising villagers to participate in planting activities

4. Diversification of livelihoods:

- Selling mangrove seeds and seedlings

Outcomes

Reducing the risk and losses caused by flooding and inundation

In terms of ecological environment, the waste pollution in rivers, along channels, inside villages, and even in the sea has been reduced. The overall quality of the environment and the appearance of the villages have significantly improved. The occurrence of channel blockages has decreased, and the situation of flooding during heavy rainfall has been improved. This has helped to reduce the risks of soil erosion and property loss.

Reducing the impact of typhoons has enriched the fishing harvest

The mangroves rehabilitation has mitigated flooding and reduced the impact of storm surges during typhoon events. To the villagers' pleasant surprise, the extensive planting of mangroves along the coast and riverbanks has brought them a richer fishing harvest. Czarina Abeo, a villager of Caridad village, said, ‘Since the destruction of the local coastal mangroves by Typhoon Haiyan in 2013, they were restored by 2015, and since then, the fishing harvest has become plentiful again. Crabs and monkeys have returned. The mangroves also cooled down the village and brought a refreshing breeze. The villagers believed that the mangroves have brought blessings to their lives.

Recognition, Participation, Cooperation of the Villagers

The villagers' increased awareness of climate change through a series of climate actions has led to a stronger recognition of the need to protect the environment from climate crisis. Through participatory discussion, the villagers love and cherish the environment of the fishing village even more. Stronger cohesion among the villagers was built, establishing a solid community foundation for future joint actions.

Areas for improvement

When reviewing the past interventions, the villagers believe that more recycling facilities should be added, so that the habit of recycling can effectively built among villagers; in terms of the accurate classification of garbage, it is still necessary to strengthen the education of the villagers to achieve more accurate and effective classification, to facilitate recycling and reusing resources.

On the other hand, the villagers are actively discussing the possibility of transforming the mangrove workshops into seed production factories for mangroves in order to generate additional income by selling mangrove seedlings.

The Story of a Female Villager, Czarina

Caridad village in Salcedo Town has over one hundred households, 72 of them are classified as poor households. Czarina Abeo's family is one of those households. Czarina is a mother of eight children. Her husband is busy with fishing and farming, while she takes up all the care responsibilities at home and participates a women support group in the village. Currently, the group plans to nurture mangrove seedlings and plant mangroves on a five-hectare stretch along the river and coast.

Located in Eastern Samar, Philippines, Caridad village is a coastal community that is vulnerable to typhoons. The village was hit by Typhoon Haiyan in 2013 and Typhoon Hagupit in 2014. Czarina's family experienced the impact of both typhoons, their livelihood is severely affected. Czarina recalls, 'We lost everything; our home was completely destroyed by the typhoon, and even our motorized boat was shattered.'

As coastal residents, they are among the most vulnerable and affected by climate change. Global warming has led to more frequent typhoons, and temperatures have risen significantly. Czarina explains that on good weather days, their fishing income is around 800 pesos. However, during the monsoon season, their fishing income drops to only 400 pesos, which is barely enough to meet their family's food needs and cannot support other expenses. 'When a typhoon comes, fishermen cannot go out to fish. The hot weather makes vegetable cultivation difficult, and crops are prone to die,' she adds.

Through the project by Oxfam, the villagers have gained knowledge about climate change. They are encouraged to plant mangroves and establish a mangrove nursery for nurturing seedlings. Mangroves serve as a natural protective barrier, reducing the impacts of disasters and improving the ecological environment. Additionally, by selling mangrove seeds and seedlings, villagers have an additional source of income. Mangroves also provide a cooling effect, making the hot environment more bearable and enhancing the villagers' resilience to extreme weather.

'We need to protect our mangroves because they serve as a natural protective barrier. After Typhoon Haiyan, we started planting mangroves in 2015, and we have seen not only marine life but also other animals like monkeys returning to nature,' says Czarina. It is evident that mangroves restore a healthy ecological environment effectively, providing suitable conditions for various species and attracting more wildlife. Czarina states, 'Now we know how to prepare food, clothing, and safe shelters when a typhoon is approaching.' Through the project, the villagers have gained awareness and understanding of climate change, and they have become more confident in coping with its impacts.

Chapter 3: Lessons Learnt

In the previous chapter, we briefly summarised the experiences from eight different countries and localities. They adopted various measures based on their respective livelihoods, living and ecological environment, development processes, climate change challenges, and existing and future resources. Their climate adaptation actions are very different, but all communities hope to explore a sustainable path to development. We believe that documenting, accumulating and sharing these local practical experiences can provide some insights for society in facing the major and uncertainties that climate change poses. The experiences can also contribute knowledge and bring a little strength and hope to different communities and groups. Below, we have summarised some important learnings from the experiences of these actions in the eight communities.

1. Assessment and Actions Tailored to Local Conditions

Although we can always see some macro-pictures of climate change from big data and regional analysis, when we focus on the adaptation of communities, on the one hand we will notice that in different communities, the climate change they face will have different and unique risks and needs due to different geographical conditions, ecological environment and local climate characteristics; on the other hand, livelihoods, daily life and ecology need to be considered in climate adaptation. The three elements inherently involve local characteristics, so when talking about adaptation on the community level, it must be tailored to local conditions. This can be seen very clearly from the differences between the eight urban and rural community cases in previous chapters.

For this reason, before any community adaptation actions, we emphasised that the first thing to do is the ‘assessment and analysis on local climate change risks’, including short, medium, and long-term data collected and analysed in the past on climate changes and the experiences of local people. From this, we can identify the challenges brought by local climate change to the livelihood, daily life and ecology of the community, and then design and prioritize various action plans to address the challenges and reduce risks in the communities.

‘Assessment and analysis on local climate change risks’ should at least include various basic climate conditions, change trends, and climate induced disasters. Moreover, the impact of these changes on community livelihood strategy, such as agriculture or employment, the arrangement (especially care work) and existing order of daily life, as well as the impact and potential risks on the overall ecological environment and geographical resources of the community are considered.

Among them, risk assessment and analysis are also a process of assessing needs and tapping existing resources. In addition to having a community perspective, in-depth analysis and judgment also need to be made from the perspective of special groups and women in the situation.

Although these processes and methods of 'locally-based analysis and action design' are not highlighted in the above chapters on the eight cases, they are actually included in every action case.

2. Traditional Wisdom and Local Resources

Communities and groups themselves are not completely without knowledge or resources to deal with climate change. In many cases, they have some existing (sometimes may have been given up) knowledge or natural resources that can help them cope with the changes, especially under local climate conditions. Wangjinzhuang Village and Shitoucheng Village rediscovered crops with stronger drought resistance from traditional crop varieties that were rarely cultivated. Moreover, the seeds continuously bred can be adapted dynamically by their own to the local climate changes. The mangroves in East Samar are nature's existing typhoon barrier and villagers. Villagers follow the tradition way to breed mangroves in small baskets made from natural materials, they avoided using a large quantity of plastic bags. Wangjinzhuang Village and Shitoucheng Village have both renovated and expanded the use of water collection and irrigation facilities with long-standing local traditions.

These resources, knowledge, and technologies carrying traditional wisdom not only save the cost of introducing the external ones, but more importantly, they rediscover, activate, and pass down the existing conditions, knowledge, and resources. Of course, in the face of new climate change challenges, we cannot rule out the need of new technologies, knowledge and resources. However, an interesting exploration is that a synergy can always happen when integrating external knowledge and technologies into traditional local wisdom and can also alleviate the possible local maladjustment to the new knowledge and technologies. The local grassroots wisdoms have great potentials to be explored in climate change adaptation. In terms of community climate change adaptation, Jiatang Grassland is also a good example of integrating modernism into traditional wisdom.

3. Give Priority to Nature

Climate change is caused by the imbalance between human behaviours and natural systems. To resolve this problem, it must be from the perspective of restoring the balance and stability of the nature as a whole. 'Nature-based' is an implicit basic value

in many community action plans. The mangroves in East Samar, the leave-made plates replacing plastic in Baitadi, and the reduction of pesticides and fertilisers emphasised by many villages, and smallholder farming techniques promoting biodiversity, these actions actually reaffirm the communities' respect to the surrounding environment and their conservation awareness.

Human life and activities interact with various other creatures. We influence and rely on one another. The experiences of many community actions have made us understand that in natural systems, the more the diversity of species and the richer diverse the interaction forms are, the more stable the natural systems will be. The balance of diversity can create efficient complementarity and lower the risk of imbalance. Natural systems with strong diversity are our best protection. Only with more mutual sharing and promotion between us and natural biological systems, we can accumulate and create more natural conditions and resources to face various possible challenges of the climate. This is true at the global level, and it is true at the community level.

4. Community Participation and Companionship

Communities' climate change conditions and risks are specific, unique, and complex in every place and between groups. Therefore, we have always emphasised that there is not necessarily a common solution that can be applied in communities. There is a variety of accumulated action experience and knowledge that can be shared, but in the end, their feasibility, appropriateness and final effect must still be evaluated when they are applied to a specific group of people and environment. Therefore, in all our community actions, we will definitely emphasise the direct participation of community members. No matter how different the level, depth, and scope of the participation are, and whether the number of participants is large or small, community participation is important in multiple action sessions such as evaluation and analysis, programme design, action prioritisation, steps and scales, implementations, problem solving, and summary etc. With the participation of community members, feasibility, appropriateness and ultimate effect of actions can be judged.

Another importance of community participation is that external support is limited and short-lived. Only the members of the community live for the long term and must cope with more and different changes in the future. Therefore, while introducing external support and participation, we must also gradually strengthen the community's participation in the process, so that their agency can grow through actual participation, unite the community, and learn to communicate and cooperate with each other. By absorbing knowledge and strengthening their ability, community members and their organisation will eventually become long-term actors and common platforms that

continue to drive the community as a whole to deal with climate change challenges in the long run.
From the eight urban and rural cases, we can all see that in the process of community action, community participation has been cultivated, strengthening the communication and cooperation between members, and helping the growth and experience accumulation of the core community members. The backbone of community members and the self-organisations are the future resource library and problem-solving platform in the community for spontaneously taking actions, uniting the community as a whole to face other climate challenges together.

5. Phased and Diversified Response

The challenges that climate change poses to communities are very diverse, and climate change adaptation actions among communities are also diverse and full of options. However, no community can respond to all challenges at once, and no community can implement all possible actions at once. We must emphasise that none of the eight community cases can solve all the problems and challenges completely in a short amount of time and perfectly. Especially when resources are limited, prioritisation and phased action are inevitable.

In addition to considering the amount of resources and the difficulty of the actions, the ranking of priorities must also consider the community's awareness, mobilisation and participation, as well as the experience and ability of the community members. When the community has not yet started, it would be appropriate to take some simple, low-investment or easy-to-succeed actions. As the community becomes more active and involved, some actions that are more difficult and require greater investment of effort can be challenged. Such a phased and diverse action plans are conducive to the community involvement and gradually organising through the process. The community in Baitadi has slowly expanded the women's network step by step more than two years of training; Liugou Village, in 10 year, went through post-disaster reconstruction, disaster prevention and reduction actions, environment beautification, and then step by step to the ecological tea growing and tea production, tea leave chain extension and production and marketing cooperatives, to carbon neutrality research; Shitoucheng Village and Wangjinzhuang Village both started with exploration by a small group of villagers, and gradually led to the participation of more villagers.

There is no one-size-fits-all adaptation plan. Resources and community participation are upgraded step by step. They can be regarded as important constraints on community action, but in fact they are also the basic steps for community development.

6. Demonstration of Women's Abilities

Many previous experiences in urban and rural community development work told us that women are important initiators in community work. From our eight community cases, including Baitadi, East Samar, Liugou Village, Shitoucheng Village, Jiatang Grassland, and even the city cleaners in Hong Kong, the main climate adaptation action takers are women.

As the most important group in the community, women have always taken the roles of pair production labour or unpaid housework and care for the elderly and children. It is not difficult to understand that when we examine 'climate change' in 'communities', we will first see the impact on women. Climate change increases field labour for pest control or replanting; climate change requires more family caregivers to have to travel farther to fetch water, which increases the walking and time pressure; climate change makes workers or caregivers more tired due to the work or care in high-temperature environments; these (and many more) impacts of climate change are borne primarily by women.

However, we also need to realise that because women are the main group in the community who have personal knowledge and experience of community life, they are also the most important intellectuals and initiators in our community. Women's experience, accumulated knowledge, and their thinking, analysis and judgment are important foundations for the design of action plans and the formation of action forces.

Women's perspective is an essential element of climate adaptation actions in communities.

7. Participation and Contributions from Multiple Parties

From the existing climate change adaptation policies and action plans in many countries or localities, we will know that 'climate adaptation action' actually involves knowledge and expertise in many different fields. At the economic and livelihood level, it may involve agriculture, industry, energy, urban planning, construction, logistics and transportation, etc.; at the living level, it may involve health, travel, astronomy and meteorology, food supply, daily care, etc. Therefore, national or local government's climate change adaptation policies and action plans must be cross-departmental, cross-professional, and involve multiple stakeholders.

At a community level, we can also realise that community climate adaptation actions will be more effective if they rely on the community as well as the knowledge and professional participation and support of people from multiple fields. The restoration of

traditional local seeds in Shitoucheng Village and Wangjinzhuang Village has the participation and support of experts and scholars from the local government's agricultural bureau. The recognition and purchase of urban consumers are also very important; women in Baitadi receive training in corporate operations and management knowledge; East Samar's waste reduction and recycling system is supported by the local government's environmental policies and plans; temperature cooling of the working environment of cleaners requires the support of employers and corporates and the requirements of government policies. Each community case can show us that the participation and contributions of multiple parties are very necessary and can enhance the effects of adaptation actions.

8. Summary

The above attempt is to summarise some important and coherent action elements, thinking and concepts from the eight urban and rural community action cases. And from the numerous individual action experiences and results, we hope to help in the future diversified actions in different communities to give some inspiration.

Every one of us, every community, every enterprise, every political, economic and social group, organisation or system, is in the same atmosphere. In other words, we are all suffering from the same fate. Climate change has tied together a variety of different groups and stakeholders within humankind. Whether it is a disaster or an opportunity depends on how united and supportive we are, and how willing we are to share our knowledge, capabilities and resources.

Action takers from the eight urban and rural communities, although they are all disadvantaged and marginalised, they have shared their efforts and ignited hope in us. We can absorb experience strength from their stories, and we hope that everyone will also be willing to pay attention to them. We take climate change adaptation as a common mission. We should start similar explorations in our own communities, and walk side by side with these communities to face the challenges climate change poses.

Chapter 4: Policy Recommendations

Coming to the last chapter of the case study, Oxfam would like to put forward some policy recommendations to governments and institutions that support climate adaptation actions based on the experience of climate adaptation in eight urban and rural communities, to create more conditions for climate change adaptation actions in other urban and rural communities.

1. Policy recommendations for national and local governments, intergovernmental organisations, and international aid organisations

- In addition to formulating climate change adaptation policies and action plans from the perspective of the country, industry or industrial sector, governments and organisations should introduce a perspective from local communities and groups (especially the disadvantaged groups) to assist with assessments on local climate change risks and formulate climate change plans that cater to the situations of local communities (including smallholders, workers, women, the elderly, children and other vulnerable groups).
- Coordinate local meteorology, scientific research, agriculture, environmental protection, and disaster response information and resources, ensuring they benefit the community.
- Strengthen cross-departmental (or cross-policy bureau) policy and resource collaboration to establish a mechanism for effective implementation and connection with the community.
- Allocate public finance to support climate change adaptation actions in relatively poor communities/groups.
- Support social organisations to carry out climate change adaptation pilot projects in relatively disadvantaged communities or groups.

2. Policy recommendations for the Hong Kong government

- Monitor and consult outdoor workers' opinions on the 'Prevention of Heatstroke at Work in a Hot Environment' guidelines and rest arrangements to optimise implementation; require employers/contractors to provide paid sick leave protection for outsourced cleaners.
- Effectively use community resources to allow subdivided flat residents to share facilities, such as washing machines, cooking equipment and some large furniture, etc. This can reduce the number of items in subdivided flats, thus helping to improve the environment. The business community should also make good use of resources by, for instance, expanding the mini-storage subsidising scheme to allow

subdivided flat residents to temporarily store some of their belongings in storage facilities, thereby increasing the space in subdivided flats.

3. Policy recommendations for the Government of the People's Republic of China

- Support each administrative village by the Ministry of Agriculture and Rural Affairs to establish a local seed bank so that villagers can store, exchange and conserve 'seeds of climate-resilient local crops'.
- Conduct a 'local climate disaster risk assessment' to assess the climate change status and climate disaster risks of the place in the next 50 years that is coordinated and implemented by the Ministry of Emergency Management and supported by the township/town government. Share the assessment report with local communities with suggested actions to deal with risks.
- Establish an inter-departmental platform to research, coordinate and formulate the 'Policy to Support Rural Communities in Adapting to Climate Change' through the State Council, led by the Ministry of Ecology and Environment, the Ministry of Agriculture and Rural Affairs, and the Ministry of Emergency Management, and with the participation of the Ministry of Civil Affairs. The Ministry of Civil Affairs can coordinate resources to support social organizations to implement 'Community Pilot for Rural Climate Change Adaptation Action' to provide reference cases for policy formulation.

4. Policy recommendations for institutions providing climate adaptation action funds in Asia

- Substantially increase the funding for climate adaptation actions in climate-vulnerable areas, and use grant-based financing instead of lending.
- Improve accounting standards for climate adaptation action funds and accurately calculate and predict the amount of funds to avoid risks such as misstatements and fraud.
- Prioritise enhancing the quality of 'costed needs assessment' to accurately know the costs that communities will pay in response to climate change.

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