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Education and Gender-Based Perceptions and Adaptations to Climate Change: Insights from Rice Farmers in Battambang Province

By

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ABSTRACT

As Cambodia's "Rice Bowl," the province of Battambang faces increasing hydrological volatility. While the Royal Government of Cambodia has prioritized climate resilience through the Pentagonal Strategy Phase I, the intra-household socio-economic barriers to adaptation remain under-researched. This study investigates how gendered perceptions and educational attainment influence the transition from reactive coping to proactive adaptation. Using a gender-disaggregated survey of 200 respondents (100 spousal pairs) in the flood-prone districts of Battambang, this research employs Cohen's Kappa statistics to measure perceptual agreement and a Probit regression model to identify the determinants of Climate-Smart Agriculture (CSA) adoption, specifically stress-tolerant rice varieties (STRVs). Our analysis identifies a significant gap in how spouses perceive slow-onset hazards; while spouses show substantial agreement on flooding ($k = 0.61$), agreement on drought is only moderate ($k = 0.42$), with women demonstrating significantly higher sensitivity to water scarcity. The Probit model identifies formal education as the primary engine of resilience, with each year of schooling increasing the probability of CSA adoption by 5.2%. However, a persistent "Gender Agency Gap" exists, as women are 3.1% less likely to adopt new technologies due to structural constraints. Most critically, the study finds that 18% of households withdraw children from school as a coping mechanism for climate shocks, creating an intergenerational poverty trap that erodes the very human capital required for future adaptation. The findings suggest that technical agricultural interventions must be coupled with climate-indexed social protection. Recommendations include integrating "Green TVET" modules into national vocational training, implementing educational grants to prevent school dropouts during climate disasters, and empowering women as community water leads to leverage their superior drought-detection capabilities.

Keywords: Climate Smart Agriculture, Education and Gender-Based Perceptions, Adaptation, Small Scale Farmers, Battambang Province

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Finally, we thank our colleagues and families for their unwavering encouragement throughout this journey. The findings and recommendations presented here are intended to contribute to the Royal Government of Cambodia's Pentagonal Strategy and the ongoing efforts to empower rural communities against the challenges of a changing climate.

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CHAPTER ONE
INTRODUCTION

1.1 Project Rationale

Agriculture remains the cornerstone of Cambodia's socio-economic development, providing the primary livelihood for approximately 70% of the rural population and contributing nearly 22% to the national Gross Domestic Product (World Bank, 2023). However, this economic reliance creates a profound structural vulnerability. Cambodia is consistently ranked among the world's most climate-sensitive nations, primarily due to its high exposure to hydrological extremes and a historically low adaptive capacity (Yusuf & Francisco, 2009). The sector's performance is inextricably linked to the pulse of the Mekong River and the Tonle Sap basin, where minor fluctuations in precipitation patterns such as the "mini-droughts" during the wet season, can lead to catastrophic crop failures and systemic economic shocks.

The urgency of this research stems from the understanding that climate change acts as a "threat multiplier" for existing socio-economic inequalities, specifically along the axes of gender and educational attainment. While the Royal Government of Cambodia has prioritized agricultural modernization through the Pentagonal Strategy Phase I, a significant "implementation gap" exists between high-level policy and the ground-level realities of the rural disadvantaged.

Vulnerability is not a neutral condition; it is socially constructed. Research indicates that female farmers in Cambodia often experience disproportionate impacts due to systemic barriers in land tenure, access to credit, and exclusion from traditional agricultural extension networks (Dankelman, 2010). However, gender alone does not dictate vulnerability. This study posits that educational attainment is the primary engine of cognitive flexibility in rural settings. Formal and informal education levels directly correlate with a farmer's "Climate Risk Perception"—the ability to distinguish between natural seasonal variability and long-term anthropogenic climate shifts (Thav et al., 2023).

Farmers with higher literacy and numeracy skills are significantly more likely to adopt Climate-Smart Agriculture (CSA) technologies, such as drought-resistant seed varieties, automated irrigation, and diversified cropping systems (Khatri-Chhetri et al., 2017). Conversely, those with limited educational backgrounds are often trapped in "reactive adaptation," relying on high-interest informal loans to

recover from shocks, which frequently leads to a debt-poverty trap. By analyzing how education influences gender-specific adaptation strategies, this proposal seeks to move beyond one-size-fits-all solutions. Instead, it aims to provide evidence for targeted pedagogical interventions—tailoring extension services to the specific literacy levels and socio-economic constraints of the most vulnerable women and smallholders.

Ultimately, this research aims to ensure that Cambodia's transition toward an "Upper-Middle Income Country" status by 2030 is not derailed by environmental shocks. By empowering the rural disadvantaged through inclusive policy and education-based capacity building, Cambodia can secure a more resilient and equitable agricultural future.

1.2. Gendered Perceptions and the Role of Human Capital

The second objective of this research is to deconstruct the gendered dimensions of climate change perception and risk assessment. Within the Cambodian agricultural context, vulnerability is not a uniform experience; rather, it is a product of "Intersectionality," where gender, educational attainment, and socio-economic status converge to determine a household's resilience (Rao et al., 2019). While climate change is a biophysical reality, the *perception* of its risks is a cognitive process heavily influenced by the available human capital within a household.

1.2.1. The Gendered Sensitivity of Natural Resource Dependency

Female farmers in rural Cambodia are often characterized by a heightened "sensitivity" to climatic shifts due to their traditional roles in water management, livestock care, and subsistence gathering (Dankelman, 2010). Because women are often the primary managers of household basic needs, they are frequently the first to detect micro-climatic changes, such as decreasing groundwater levels or shifts in soil moisture. However, academic literature highlights a "Perception-Action Gap": while women may perceive the risks accurately, they often lack the institutional agency—such as land titles or access to formal credit—to implement large-scale adaptation strategies (Osbahr et al., 2010). This research seeks to identify these gender-specific gaps to ensure that climate policies do not inadvertently overlook the female experience.

1.2.2. Education as a Determinant of Adaptive Strategy

A critical, often overlooked factor in this equation is the role of educational levels. Education serves as the foundational "absorptive capacity" that allows farmers to process complex climate information and translate it into viable technical changes (Deressa et al., 2009). This study argues that the disparity in adaptation is not merely a gender issue but an information equity issue.

There is a significant correlation between formal literacy and the transition from "short-term coping" (e.g., selling assets or reducing food intake) to "long-term adaptation" (e.g., adopting drought-resistant cultivars or investing in multi-seasonal irrigation). By analyzing the influence of educational levels, we aim to design tailored pedagogical frameworks. For instance, extension services for farmers with lower formal education may require visual-based, hands-on demonstration plots, whereas those with higher literacy can be empowered through digital weather-index information systems. Empowering women with these specific, educationally tailored skills is not just a social imperative; it is a mechanical necessity for the sustainability of the Cambodian labor market and rural economy.

1.3. Vulnerability and Adaptation of Smallholder Rice Farmers

The third pillar of this research focuses on the resilience of smallholder rice farmers, who constitute the foundational layer of Cambodia's domestic food security and rural labor market. Despite their central economic role, these farmers operate within a high-risk environment characterized by small landholdings, limited capital reserves, and a profound exposure to hydro-meteorological shocks (Thav et al., 2023).

1.3.1. The "Atomized" Farmer and Collective Vulnerability

A primary challenge identified in this study is the fragmented nature of smallholder production. Most rural rice farmers operate as "atomized" economic units, lacking the benefits of economies of scale or collective bargaining power through robust agricultural cooperatives. In the absence of unified farmer organizations, these individuals are highly susceptible to market fluctuations and climate-related "shocks," such as flash floods and prolonged heat stress (Tong et al., 2019). When shocks occur, the lack of a social or professional safety net often forces these "rural disadvantaged" populations into suboptimal survival strategies—such as the distressed sale of livestock or migration for low-skilled manual labor—which further erodes the long-term human capital of the agricultural sector.

1.3.2. From Reactive Coping to Strategic Adaptation

The research will classify the specific measures farmers currently utilize to combat climate variability. By identifying whether farmers are merely reacting to crises, for instance, by pumping groundwater during droughts at a high fuel cost, or proactively adapting, such as by utilizing Short-Duration Rice Varieties (SDRVs) or SRI (System of Rice Intensification) techniques, our research provides a baseline for effective policy design.

Furthermore, this section explores the "Adaptation Deficit," where farmers may possess the willingness to change but lack the technical and financial "enablers" to do so. By mapping these

responses, the study will provide policymakers with the necessary data to design targeted agricultural development projects. These interventions must be tailored to the specific ecological zones and socio-economic constraints of Cambodia's provinces, ensuring that climate-smart infrastructure and extension services are both accessible to the most vulnerable and impactful for the national economy.

1.4. Policy Implications and Community-Based Engagement

The final component of this study addresses the translational gap between localized climate data and national policy formulation. For climate adaptation to be effective, it must transition from top-down mandates to "bottom-up" evidence-based interventions that reflect the heterogeneous needs of rural populations (Mak, 2017). By systematically mapping how farmers perceive and respond to floods, droughts, heat stress, and water scarcity, this research provides the empirical foundation necessary to design agricultural development projects that are both contextually relevant and structurally impactful.

1.4.1. Strengthening the Institutional Bridge

The primary objective of this research is to identify the most effective conduits for information dissemination. If findings indicate a pervasive lack of climate risk awareness among smallholders, this signals a critical need for the modernization of Agricultural Extension Services. Literature suggests that extension staff act as the vital "knowledge bridge" in Cambodia, yet their efficacy is often hampered by limited resources and a lack of gender-sensitive training materials (MoA, 2021).

Conversely, if the data reveals that farmers possess a high level of risk awareness but lack the capacity to respond, the policy focus must shift toward Institutional Enabling Environments. This includes the provision of climate-resilient infrastructure, such as solar-powered irrigation and community seed banks, and the development of "Climate-Index Insurance" products to protect the rural disadvantaged from catastrophic asset loss (ADB, 2022).

1.4.2 Participatory Engagement and Localized Agency

The methodology of this proposed work is inherently participatory. By actively engaging with rice farmers and village leaders, the study adopts a Community-Based Adaptation (CBA) framework (Smit & Wandel, 2006). Village leaders are not merely intermediaries; they are key stakeholders who hold the social capital necessary to drive behavioral change.

Personal interaction and in-depth qualitative interviews will be utilized to capture the nuanced socio-economic circumstances of the rural poor. This engagement serves a dual purpose: it provides the researchers with high-resolution data on local coping mechanisms while simultaneously serving as an informal educational intervention for the community. By validating and enhancing existing indigenous coping strategies through scientific insight, this project contributes to a more resilient

agricultural production system. Ultimately, such efforts are vital for protecting Cambodia's economic stability, as the majority of national income and rural livelihoods remain intrinsically tied to the climate-dependent agricultural sector.

1.5. Research Objectives

The overarching goal of this study is to evaluate the climate-resilience of smallholder rice farmers in Battambang Province, Cambodia, by analyzing the intersection of gendered risk perception, educational attainment, and technical adaptation. Specifically, the project aims to:

- Assess the alignment between localized climate perceptions and observed environmental shifts.
- Identify the socio-economic determinants (gender, education, and household assets) that dictate adaptive capacity.
- Evaluate the efficacy of current coping mechanisms and the barriers to adopting Climate-Smart Agriculture (CSA).

1.6. Research Questions

The study aims to answer the following research questions:

RQ1: How do rice farmers in the target regions perceive the presence and local impacts of climate change on their livelihoods and the environment? Furthermore, to what extent do these perceptions vary significantly across different gendered roles and levels of educational attainment?

RQ2: To what degree have climate-induced hydrological extremes (e.g., erratic rainfall, droughts, and flooding) compromised the socio-economic stability and food security of smallholder rice households?

RQ3: What specific adaptation strategies are currently being deployed by rural households? Specifically, which Climate-Smart Agriculture (CSA) technologies—such as specialized irrigation systems, short-duration crop varieties, or soil conservation techniques—are currently integrated into local farming systems?

RQ4: Which socio-economic, institutional, and cognitive factors act as the primary drivers or barriers in a farmer's decision-making process regarding the adoption of formal CSA technologies and practices?

CHAPTER TWO
LITERATURE REVIEW

2.1. Climate Vulnerability and Rice Production in the Tonle Sap Basin

Cambodia is consistently identified as one of the most climate-vulnerable nations in Southeast Asia, largely due to its low adaptive capacity and the extreme climate sensitivity of its agricultural sector (NCSD/MoE, 2020; Yusuf & Francisco, 2010). The Tonle Sap River Basin, often referred to as the heart of Cambodia's food system, supports over one-third of the national population and is critical to national food security (IRRI, 2026). However, the basin's "flood-pulse" ecology, characterized by the seasonal reversal of the Tonle Sap River, makes it acutely sensitive to shifts in both local precipitation and Mekong River hydrology (Nuorteva et al., 2010).

2.1.1. The Anatomy of Risk Exposure

Vulnerability within the basin is driven by the increasing frequency and intensity of hydrological extremes. Recent findings from the *Knowledge, Attitudes, and Practices (KAP3)* study indicate that nearly three-quarters of Cambodians have perceived significant increases in temperature and drought frequency over the past decade (NCSD/MoE, 2020).

- Irregular Rainfall Patterns: The intensification of the wet and dry seasons has led to prolonged flooding and devastating "mini droughts" during the critical transplanting phase of rice production (IRRI, 2026; Thav et al., 2023).
- Thermal Stress and Productivity: Rising temperatures are anticipated to seriously impact rice crops, with models suggesting a potential fall in yields without technical adaptation (MDPI, 2018; Thav et al., 2023).
- Yield Loss and Food Insecurity: During extreme weather events, such as the 2011 floods or 2016 drought, hundreds of thousands of hectares of rice fields were destroyed, affecting over 260,000 families and triggering localized food shortages (NCSD/MoE, 2019).

2.1.2. Structural Vulnerability and the Poverty Trap

The vulnerability of Tonle Sap smallholders is not purely environmental but is compounded by a lack of access to formal "enablers" of resilience.

- Dependency on Rainfed Systems: Despite the vital role of irrigation, the majority of smallholders remain dependent on rainfed systems with limited access to modern water management infrastructure (IRRI, 2026; MDPI, 2018).

- Socio-Economic Barriers: Research demonstrates that the poorest rural households are the most vulnerable, as they often lack the capital reserves to diversify their livelihoods (Nuorteva et al., 2010; MDPI, 2025).
- The Debt Cycle: When faced with shocks, many farmers rely on "reactive coping," such as taking high-interest loans from informal moneylenders or selling household assets (e.g., livestock), which often leads to a long-term debt-poverty trap (MDPI, 2025; Thav et al., 2023).

Ultimately, while many Cambodians sense these environmental shifts, the level of technical understanding regarding long-term adaptation remains low, highlighting a critical need for targeted education and "gender-sensitive" policy interventions (NCSD/MoE, 2020; Thav et al., 2023).

2.2. The Gendered Dimensions of Climate Impacts

In the academic discourse on environmental change, vulnerability is increasingly recognized not as a biophysical inevitability, but as a socially constructed condition. In the Tonle Sap Basin, the impacts of climate change are profoundly gendered, dictated by the intersection of traditional labor roles, unequal access to productive assets, and systemic gaps in institutional support (Dankelman, 2010; Rao et al., 2019).

2.2.1. Gendered Division of Labor and Resource Sensitivity

Rice farming in Cambodia relies heavily on a gendered division of labor that places women at the forefront of climate sensitivity. While men are often responsible for land preparation and heavy machinery, women provide approximately 44% to 48% of the total labor in rice-based systems, including transplanting, weeding, and post-harvest processing (McKinley et al., 2016; USAID, 2021).

- Dependency on Natural Resources: Women are the primary managers of household water, fuel, and food security. As climate change leads to groundwater depletion and forest degradation, the time-poverty of women increases significantly as they must travel further to secure these basic needs (NCSD/MoE, 2020; UN Women, 2021).
- The "Triple Burden": Rural Cambodian women face a "triple burden" of productive farming labor, reproductive household care, and community management. Climate shocks, such as flash floods, disrupt all three spheres simultaneously, leaving women with less time to engage in the adaptive learning or "extension services" necessary for resilience (Resurrección, 2017; Sopheak et al., 2023).

2.2.2. Inequality in Adaptive Assets and Agency

A critical factor in gendered vulnerability is the disparity in "Adaptive Agency", the power to make decisions regarding farm management and technology adoption.

- Land Tenure and Credit Access: Despite legal frameworks, female farmers often have less security in land tenure and face greater hurdles in accessing formal credit compared to men. This limits their ability to invest in high-cost adaptation measures like solar irrigation or climate-resilient seed varieties (CDRI, 2021; Rao et al., 2019).
- Information Asymmetry: Agricultural extension services in Cambodia have historically targeted "heads of households," who are traditionally identified as male. This creates a significant information gap; while women are often the ones identifying early signs of crop stress or pest infestations, they are frequently excluded from the technical training required to address these issues effectively (McKinley et al., 2016; Thav et al., 2023).

2.2.3. Out-Migration and the "Feminization" of Agriculture

Climate-induced crop failures in the Tonle Sap region have accelerated the out-migration of male laborers to urban centers or neighboring countries. This phenomenon has led to the "feminization of agriculture," where women remain behind to manage farms under increasingly volatile conditions (Paris et al., 2009; USAID, 2021). These "women left behind" must assume all management responsibilities but often do so without an increase in social status or access to the technical tools required to maintain productivity in a changing climate (UN Women, 2021).

2.3. Perception, Knowledge, and the Perception-Action Gap

A critical area of inquiry in climate resilience is the alignment—or misalignment—between a farmer's perception of environmental risk and their subsequent adaptation behavior. While recent national surveys in Cambodia indicate that an overwhelming majority of the population (approximately 98%) has experienced climate variability, there remains a significant "Knowledge-Practice Gap" regarding long-term adaptation strategies (NCSD/MoE, 2020; Thav et al., 2023).

2.3.1. Cognitive Determinants: Risk Perception and Climate Literacy

Risk perception is not a purely objective assessment of data; it is a cognitive process shaped by Human Capital (education) and Social Capital (gendered networks).

- The Role of Formal Education: Academic research suggests that higher educational attainment is the strongest predictor of "Climate Literacy", the ability to attribute seasonal weather shifts to anthropogenic climate change rather than natural variability (Deressa et al., 2009). Farmers with higher formal education are significantly more likely to perceive

long-term shifts in temperature and rainfall, allowing them to move beyond short-term "coping" (e.g., selling assets) toward strategic "adaptation" (e.g., investing in new irrigation technology) (Sopheak et al., 2023).

- Gendered Perception Gaps: In the Tonle Sap region, husbands and wives often show high levels of agreement on "high-visibility" indicators like major floods or droughts. However, a "Perception Gap" often exists regarding the *severity* of the impact. Studies show that because women manage the household's daily food and water security, they often report longer periods of rice deficit and higher levels of psychological stress compared to men (McKinley et al., 2016; UN Women, 2025).

2.3.2. The "Perception-Action Gap" in Smallholder Systems

A common finding in Cambodian agricultural research is that even when farmers accurately perceive climate risks, they frequently "do nothing" in response (Thav et al., 2023). This phenomenon, known as the "Perception-Action Gap," is driven by several structural barriers:

- Resource Constraints: Lack of capital and limited access to formal irrigation are primary inhibitors. Even if a farmer perceives a coming drought, the absence of physical infrastructure prevents proactive watering (Nuorteva et al., 2010).
- Information Asymmetry: While farmers may sense the change, they often lack the "procedural knowledge"—the specific technical skills—required to implement Climate-Smart Agriculture (CSA). This is particularly true for female farmers, who are often excluded from the extension service staff's training sessions (MAFF, 2020; UN Women, 2025).
- The "Wait-and-See" Strategy: Due to the high cost and risk of new technologies, many smallholders default to traditional seeds and techniques, waiting for successful "demonstration effects" from neighbors before committing their own limited resources (Thav et al., 2023).

2.3.3. Intra-household Decision Making and Adaptive Agency

Finally, perception alone does not lead to action unless the person perceiving the risk has the "Adaptive Agency" to change farm management. Within the Cambodian household, decision-making is often shared, but men traditionally hold more influence over large-scale capital investments (e.g., buying a tractor or digging a pond), while women manage daily household finances (McKinley et al., 2016). For education programs to be effective, they must target the specific "agency gaps" within the household, ensuring that both spouses possess the technical knowledge and institutional power to implement resilience strategies.

2.4. Divergent Coping and Adaptation Strategies

The selection of a response to climate variability is rarely a neutral technical choice; rather, it is a strategic decision dictated by household resource endowments and gendered responsibilities. Academic literature distinguishes between "Reactive Coping", which is short-term, often erosive actions taken during a crisis, and "Planned Adaptation", the proactive investments intended to reduce future vulnerability (Smit & Wandel, 2006).

2.4.1. Gendered Coping Mechanisms

In the Tonle Sap Basin, women and men often employ different coping strategies based on their control over specific assets. Women are frequently the primary agents of "consumption smoothing." In response to rice deficits, women are statistically more likely to reduce their own food intake, utilize small-scale personal savings, or negotiate informal loans to sustain household nutrition (McKinley et al., 2016; UN Women, 2021). Labor Reallocation: Men often respond to crop failure through seasonal out-migration to urban centers like Phnom Penh or across borders to Thailand. While this provides immediate cash flow, it often leaves women with an increased agricultural workload, creating a "labor scarcity" that hampers long-term farm improvements (Paris et al., 2009).

2.4.2. Technical Adaptation and the "Innovation Gap"

Technical adaptation at the farm level includes changing planting dates, varying rice varieties, and investing in supplementary irrigation. However, research suggests a "wait-and-see" approach among the disadvantaged rural areas. Smallholders often delay the adoption of new practices until they witness successful "demonstration effects" in their immediate community, a trend driven by high risk-aversion and a lack of insurance buffers (Thav et al., 2023).

2.4.3. Acceptability and Adoption of Climate-Smart Agriculture (CSA)

The successful scaling of Climate-Smart Agriculture (CSA) depends on the "Perceived Attribute of Innovation"—specifically, whether a technology is viewed as labor-saving, cost-effective, and easy to implement.

- Technology Preference: Stress-tolerant rice varieties (STRVs) and short-duration varieties are the most widely accepted CSA technologies in Cambodia. This is because the resilience is "embedded" in the seed, requiring minimal change to traditional farming labor (IRRI, 2026).
- The Gender-Training Nexus: A major barrier to CSA adoption is the "extension gap." Extension services often focus on technologies that require significant capital or land ownership (typically male-dominated) while overlooking small-scale, labor-intensive practices that might benefit female farmers. Furthermore, when training is held at times that conflict with domestic duties, women's participation—and subsequent adoption of practices like Integrated Pest Management (IPM)—remains low (MAFF, 2020; McKinley et al., 2016).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Research Design and Framework

This study adopts a mixed-methods research design, integrating qualitative insights with quantitative empirical analysis to provide a holistic evaluation of climate-resilient livelihoods. The methodological framework is grounded in the Comparative Intra-household Analysis approach successfully pioneered by McKinley et al. (2016/2019) in the Mekong River Delta. By adopting this validated framework, the study ensures that the data collected in Cambodia is structurally comparable to regional benchmarks while remaining sensitive to the unique socio-economic landscape of the Tonle Sap Basin (McKinley et al., 2016).

3.1.1. The Rationale for a Mixed-Methods Approach

The use of a mixed-methods approach is a mechanical necessity for addressing the "Perception-Action Gap" identified in recent literature (Thav et al., 2023). While quantitative data allows for the statistical modeling of Climate-Smart Agriculture (CSA) adoption rates, qualitative interviews provide the necessary context to understand *why* certain barriers, such as gendered time-poverty or educational constraints, hinder technical transitions (Deressa et al., 2009; NCSD/MoE, 2020). This dual-track approach allows the research to move beyond simple descriptive statistics toward an inferential understanding of "Adaptive Capacity."

3.1.2. Intra-household Comparative Framework

A central pillar of this design is the decision to interview both husbands and wives within the same household. Academic discourse on gender and environment emphasizes that households do not operate as "unitary economic units" with shared information and pooled resources (Dankelman, 2010; Paris et al., 2009). Instead, they are sites of negotiation where perception, risk assessment, and decision-making power vary significantly by gender (Rao et al., 2019). By structuring the fieldwork to capture these divergent perspectives, the study can apply Kappa statistics to measure inter-rater agreement, thereby identifying the specific information gaps that agricultural extension services must bridge (Viera & Garrett, 2005; McKinley et al., 2016).

3.1.3. Alignment with National Policy Objectives

Furthermore, the research design is strategically aligned with Cambodia's National Strategic Development Plan (NSDP) and the Gender and Climate Change Action Plan (GCCAP). By focusing on "Gendered Perceptions" and "Educational Determinants," the methodology directly supports the Royal Government of Cambodia's goal of enhancing the climate-resilience of the "rural disadvantaged" through targeted human capital development (MAFF, 2020; NCSD/MoE, 2020).

3.2. Selection of Study Areas

The selection of study sites was guided by a "Purposive Sampling" strategy, targeting regions where the intersection of agricultural productivity and climate exposure is most acute. Following this logic, Battambang Province was selected as the primary research theater. Widely recognized as the "Rice Bowl" of Cambodia, Battambang is the nation's leading producer of high-quality fragrant and seasonal rice, making its stability central to national economic resilience and the Royal Government of Cambodia's export targets (World Bank, 2023).

3.2.1. Site Selection

Within Battambang, the study focuses on two specific villages: Kompong Preah and Kompong Prieng. These villages were selected due to their extreme susceptibility to natural hazards, specifically the dual threats of flash flooding and prolonged droughts. Their geographical positioning is critical; located in close proximity to the Tonle Sap (Great Lake), these areas are subject to the massive seasonal fluctuation of the lake's water levels. During the rainy season (mid-June to late October), these communities face rising water levels that often lead to total crop inundation, while the dry season brings increasing thermal stress and water scarcity (Nuorteva et al., 2010; Thav et al., 2023).

3.2.2. Rationale for Site Selection

The rationale for choosing these two villages is three-fold:

- Economic Representative Significance: As communities renowned for intensive agricultural activities, the challenges faced here are representative of the broader smallholder experience in the Lower Mekong Basin.
- Climate Exposure: By selecting areas "hardest hit" by climate-related hazards, the research can better identify the "ceiling" of traditional coping mechanisms and the urgent need for Climate-Smart Agriculture (CSA) adoption.
- Logistical Comparability: These sites offer a socio-economic environment similar to the villages studied by McKinley et al. (2016) in the Mekong Delta, allowing for a robust cross-border comparison of how different national institutional frameworks (Cambodia vs. Vietnam) support farmers in geographically similar "hotspots."

3.3. Sampling Strategy and Participant Selection

The study employs a multi-stage stratified random sampling technique to ensure that the data collected is representative of the socio-economic diversity within the Tonle Sap Basin. By focusing on household pairs rather than individual heads of households, the research moves away from the "unitary household" model and toward an understanding of intra-household gender dynamics (Paris et al., 2009; McKinley et al., 2016).

3.3.1. Inclusion Criteria and Consultation

The selection process begins with an institutional consultation phase involving Village Heads (*Mekhum*) and community leaders in Kompong Preah and Kompong Prieng.

- The 10-Year Residency Rule: To ensure that respondents can provide an accurate longitudinal assessment of climate shifts, only farmers with at least 10 years of continuous farming experience in the target village will be eligible for participation. This threshold is critical for capturing "perceived" changes in decadal weather patterns versus short-term seasonal variability (Thav et al., 2023).
- Stratification by Household Type: From the list provided by village leaders, the study will randomly select 50 dual-adult households from each village. A "dual-adult household" is defined as a unit where both the husband and wife are active participants in agricultural management or labor.

3.3.2. The Spousal-Pair Interview Protocol

To achieve the target sample of 200 participants, both the husband and wife from each of the 100 households selected will be interviewed. This specific design is adopted to allow for the application of Kappa statistics to measure inter-rater agreement on shared climate shocks (Viera & Garrett, 2005).

- Mitigation of Social Desirability Bias: A central methodological challenge in rural surveys is "interviewer interference" or "social desirability bias," where one spouse (typically the wife) may defer to the opinions of the other in a joint setting.
- Separate Interview Streams: To mitigate this, the study utilizes an independent interview protocol, where male and female respondents are interviewed simultaneously but in separate physical locations. This ensures that women can speak freely about their specific labor burdens, financial constraints, and perceptions of climate risk without the presence of their husbands (McKinley et al., 2016; UN Women, 2021).

3.3.3. Implementation and Enumeration

To maintain a high standard of data integrity, the survey will be conducted by an experienced team of enumerators. These contractors will undergo specific training on gender-sensitive interviewing techniques and the nuances of the local Battambang dialect. Fieldwork is strategically scheduled for the two-month window between August 2025 and October 2025, a period following the primary harvest when farmers are most available for in-depth interaction and reflective assessment.

3.4. Survey Indicators and Variable Selection

The survey instrument is designed to capture a multi-dimensional snapshot of rural livelihoods, moving from basic demographic facts to complex cognitive perceptions. The variables selected for this study are categorized into four primary thematic clusters, largely adapted from the benchmark study by McKinley et al. (2016) to facilitate cross-regional comparison.

3.4.1. Household Endowments and Human Capital

This cluster establishes the baseline "Adaptive Capacity" of the respondent. Key variables include:

- Socio-Demographic Profiles: Sex, age, and household size.
- Education and Experience: Years of formal schooling and years of farming experience. These are critical independent variables for the Probit model, as they are hypothesized to be the primary determinants of "Climate Literacy."
- Productive Assets: Farm size (hectarage), land tenure status, and livestock ownership.

3.4.2. Gendered Labor and Livelihood Composition

To analyze the "Feminization of Agriculture" and the intra-household division of labor, the survey tracks:

- Labor Participation: Specifically, who performs land preparation, irrigation management, weeding, and post-harvest processing.
- Income Diversification: The ratio of income derived from rice production versus off-farm labor, poultry, or small-scale fisheries. This identifies the household's "Sensitivity" to crop failure.

3.4.3. Climate Perceptions and Impact Assessment

This cluster provides the data for the Kappa statistics analysis.

- Hazard Identification: Perceived changes in the frequency and intensity of floods, droughts, storms, and extreme heat.

- The "Education-Impact" Nexus: A unique focus of this study is the impact of climate shocks on children's education. We measure this through indicators of school dropout rates or increased child labor on the farm following a harvest failure, providing a longitudinal look at how climate change threatens the next generation's human capital (NCSD/MoE, 2020).

3.4.4. Adaptive Agency and CSA Acceptability

The final cluster evaluates the "Action" phase of the framework:

- CSA Adoption: Knowledge and usage of Climate-Smart Agriculture, such as stress-tolerant rice varieties (STRVs), crop rotation, and efficient water management systems.
- Information and Financial Conduits: Access to weather forecasts, frequency of contact with extension services, and membership in social or agricultural cooperatives.
- Financial Buffers: Access to formal credit versus high-interest informal loans, and the role of remittances in buffering climate shocks.

Table 3.1. Summary of Key Research Variables

Cluster	Key Indicators	Purpose in Analysis
Human Capital	Education, Age, Experience	Determinants in Probit Model
Gender Roles	Division of Labor, Decision Power	Identification of Agency Gaps
Risk Perception	Flood/Drought Frequency	Inter-rater Agreement (Kappa)
Social Impacts	Child Education/Dropout rates	Vulnerability Assessment
Adaptation	CSA Adoption, Finance Access	Efficiency of Response

Source: Authors' Compilation

3.5. Data Analysis and Empirical Modeling

The analytical phase of this research is designed to bridge the gap between subjective perceptions and objective socio-economic determinants. Data analysis will be conducted in three sequential stages: (1) descriptive profiling, (2) perceptual agreement analysis using Kappa statistics, and (3) econometric modeling of adaptation drivers using Probit regression.

3.5.1. Analysis of Perceptual Agreement (Kappa Statistics)

To address Research Question 1—whether husbands and wives perceive climate shocks differently, the study employs the Cohen's Kappa (k) statistic. This method is the academic standard for measuring inter-rater reliability for categorical data (Viera & Garrett, 2005). Unlike simple percentage agreement, Kappa accounts for the possibility of agreement occurring by chance. The coefficient is calculated as:

$$k = \frac{p_0 - p_e}{1 - p_e} \quad (3.1)$$

Where:

- p_0**:** The relative observed agreement among spouses.
- p_e**:** The hypothetical probability of chance agreement.

The results will be interpreted using the Landis and Koch (1977) scale, where a $k > 0.60$ indicates substantial agreement. A low Kappa value in this study would suggest significant "Information Asymmetry" within the household, pointing to a need for more gender-inclusive agricultural extension services (McKinley et al., 2016).

3.5.2. Econometric Modeling of CSA Adoption (The Probit Model)

To identify the factors that influence a farmer's decision to adopt Climate-Smart Agriculture (CSA), the study utilizes a Probit Regression Model. This model is appropriate for binary dependent variables (e.g., adopted vs. did not adopt) and assumes that the underlying decision is driven by a latent "utility" or benefit perceived by the farmer. The empirical specification for the model is:

$$P(Y_i = X_i) = \varphi(\beta_0 + \beta_1 Educ_i + \beta_2 GenRole_i + \beta_3 Exp_i + \beta_4 Ext_i + \beta_5 Fin_i + \varepsilon_i \quad (3.2)$$

Where the variables are defined as:

- Y_i (Dependent Variable): A binary indicator for the adoption of specific CSA technologies (e.g., 1 for using stress-tolerant rice varieties, 0 otherwise).
- $Educ_i$: Years of formal schooling (testing the Human Capital hypothesis).
- $GenRole_i$**:** A categorical variable representing the respondent's role in the division of labor.
- Exp_i**:** Years of farming experience.
- Ext_i: $Extension\ of\ Service$
- Fin_i**:** Access to formal credit or micro-finance.
- φ**:** The cumulative distribution function (CDF) of the standard normal distribution.
- ε_i**:** The error term.

3.5.3. Data Integrity and Software

All quantitative data will be cleaned and imputed using Stata 17. To ensure the robustness of the Probit results, we will conduct post-estimation tests, including marginal effects analysis. This allows us to quantify exactly how much the probability of adopting a CSA technology increases for every additional year of education or for having access to specific climate training programs. This level of detail is essential for providing actionable Monitoring and Evaluation recommendations for future labor and agricultural projects in Cambodia.

3.6. Implementation Plan and Project Timeline

The proposed study is designed to be executed over a ten-month period, beginning in May 2025 and concluding with the final report submission in February 2026. The timeline is structured to allow for rigorous preparation, evidence-based fieldwork, and a comprehensive analysis phase that aligns with the reporting requirements of the funding body.

3.6.1. Phase I: Preparation and Institutional Consultation (June – July 2025)

The initial phase focuses on the formalization of research instruments and site entry. The survey questionnaires was adapted from the McKinley et al. (2016) study and translated into Khmer, ensuring that technical terms regarding Climate-Smart Agriculture (CSA) are accessible to local smallholders. We conducted preliminary visits to Kompong Preah and Kompong Prieng to consult with village heads (*Mekhum*). These meetings were essential for securing community trust and generating the stratified list of households with the required 10-year farming history.

3.6.2. Phase II: Fieldwork and Data Collection (August 2025 – October 2026)

The core data collection is strategically timed to avoid the peak labor demands of the planting season. Fieldwork will take place over a two-month period (December 2025 to January 2026). This window corresponds with the post-harvest cycle in the Tonle Sap Basin, a period when farmers are most reflective regarding the season's climate impacts and have the highest availability for the spousal-pair interview protocol. An experienced data collection fieldwork supervisor will be engaged to conduct 200 individual interviews. This ensures that the data is gathered using professional, gender-sensitive techniques that minimize enumerator bias.

3.6.3. Phase III: Analysis and Synthesis (November 2025 – February 2026)

The final month is dedicated to transforming raw data into policy-relevant evidence. Following data cleaning, we will execute the Kappa statistics and Probit regression models to identify the key determinants of adaptation. The findings will be synthesized into a final report that highlights the intersection of Education, Gender, and CSA Adoption. By meeting the February 28 deadline, the study provides timely insights that can be integrated into the following year's agricultural extension planning and national labor sector monitoring.

Table 3.2. Summary of Project Milestones

Period	Milestone	Key Deliverable
May – Jun 2025	Project Inception	Finalized Survey Instrument
Jun – Jul 2025	Site Consultation	Participant List & Fieldwork Logistics
Oct – Nov 2025	Fieldwork	200 Raw Household Interview Records
Nov 2025 – February 2026	Data Analysis	Kappa & Probit Model Results
May 2026	Final Submission	Complete Research Report

Source: Authors' Compilation

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1. Socio-Economic Profile and Structural Vulnerabilities

The socio-economic landscape of the study area in Battambang reflects a community deeply embedded in traditional agrarian structures yet facing modern transitions. The profiling of 200 respondents (100 household pairs) provides an vital overview of the human capital and economic constraints that act as the primary "filters" for climate adaptation.

4.1.1. Demographic Composition and the Education Gap

The average age of respondents is 46.3 years, indicating a workforce with significant "experience" of local weather patterns, with an average of 26 years of farming experience. However, a granular analysis of human capital reveals a concerning disparity in formal education. Our findings show:

- Male Education: Husbands reported an average of 7.1 years of schooling, with most reaching the lower-secondary level.
- Female Education: Wives reported a significantly lower average of 5.3 years, with a higher concentration of "primary school incomplete" status.

This 1.8-year education gap is statistically significant ($p < 0.05$). In the context of the Probit model, this gap suggests that women may face higher cognitive barriers to processing technical Climate-Smart Agriculture (CSA) manuals or navigating formal credit applications, which often require a certain level of functional literacy.

4.1.2. Economic Specialization and Land Tenure

The economic profile of the households confirms a "Mono-crop Dependency." 92% of the households are primarily dependent on rice, with an average landholding of 3.2 hectares per household. While 78% of the land is reported as "owned," the lack of formal land titles among female respondents is a hidden vulnerability. When climate shocks occur, households without formal titles struggle to access bank-led finance, forcing them toward high-interest private lenders. Non-farm income remains low, contributing only 12% to the total household budget. This lack of diversification means that when

floods inundate the "Rice Bowl" of Battambang, the household has no "economic shock absorber," leading directly to the reactive coping strategies (like asset liquidation) discussed in later sections.

4.1.3. Labor Division and Adaptive Agency

A critical socio-economic indicator is the Gender Division of Labor. While men dominate heavy tasks like land preparation, women are the primary labor force for transplanting and weeding. Despite their heavy involvement in labor, only 24% of wives reported having the primary "final say" in purchasing major agricultural inputs. This "Labor-Agency Paradox", where those who perform the work do not control the investment, is a structural barrier to adoption. If a woman perceives a drought risk but lacks the agency to purchase stress-tolerant seeds, the household remains vulnerable despite her awareness.

Table 4.1. Socio-Economic Baselines

Variable	Male (N=100)	Female (N=100)	Analysis
Average Age	47.2	45.4	Experienced workforce
Years of Schooling	7.1	5.3	Statistically Significant Gap
Farming Experience	28 yrs	24 yrs	High localized knowledge
Primary Income	Rice (92%)	Rice (92%)	Extreme climate sensitivity
Decision-making Power	High	Low	Structural Barrier to CSA

Source: Authors' Calculation

4.2. Perceptions of Climate Hazards: Analyzing the Spousal Agreement Gap

A central objective of this study is to determine if men and women within the same household possess a unified understanding of climate risk. Using Cohen's Kappa (k) statistics, we measured the degree of inter-rater agreement between 100 husband-wife pairs regarding observed climate hazards over the past decade.

4.2.1. High-Visibility Hazards: Substantial Agreement

The analysis shows Substantial Agreement ($k > 0.60$) on hazards that have immediate and high-visibility impacts on rice production.

- Increased Temperature ($k = 0.74$): Both spouses reported a significant rise in heat stress. This high alignment is likely due to the shared physical experience of laboring in the fields during Battambang's increasingly intense dry seasons.
- Flood Frequency ($k = 0.61$): Given the proximity of Kompong Preah and Kompong Prieng to the Tonle Sap, flooding is a catastrophic event that disrupts the entire household. Both

husbands and wives accurately recalled major inundation events, showing strong synchronization in their risk assessment.

4.2.2. The Drought Disparity

The most significant finding in this section is the Moderate Agreement (k = 0.42) regarding drought severity. While 82% of wives identified "increased drought" as a primary concern, only 68% of husbands shared this view. This disparity highlights the "Micro-Climatic Sensitivity" of female farmers. Because women are traditionally responsible for household water security and the maintenance of home gardens/livestock, they are more sensitive to "mini-droughts" or water table shifts that may not yet have caused a total rice crop failure. Men, whose primary focus is the large-scale rice harvest, often only categorize an event as a "drought" if it leads to a significant loss in yield.

4.2.3. Perceptions of Erratic Rainfall and Seasonal Shifts

Agreement on erratic rainfall (k = 0.68) was substantial, with both parties noting that the traditional "cropping calendar" is no longer reliable. Respondents noted that rainfall is now "later and shorter," which directly complicates the timing of seedling preparation, a task often shared by both spouses.

4.2.4. Implications for Extension Services

The "Moderate" agreement on drought suggests that information flow within the household is not perfect. If a wife perceives a drought risk that her husband does not, the household may delay purchasing drought-resistant seeds or investing in irrigation until it is too late. This finding validates the necessity of gender-disaggregated extension training, ensuring that climate information reaches both the person managing the field and the person managing the household's broader water resources.

Table 4.2. Intra-Household Perceptions on Climate Hazards

Variable	Husband (%)	Wife (%)	Kappa (k)
Increased Heat	89%	91%	0.74
Erratic Rain	84%	85%	0.68
Flooding	76%	72%	0.61
Drought	68%	82%	0.42

Source: Authors' Calculation

4.3. Climate Shocks and Human Capital

Beyond the immediate loss of crops and livestock, the findings reveal a deeply concerning trend regarding the long-term human capital of the Tonle Sap basin. In this study, we categorized climate impacts not just by financial loss, but by their influence on the "education-adaptation nexus."

4.3.1. Educational Interruption as a Reactive Coping Strategy

The findings reveal that when households face severe climate shocks, particularly the high-magnitude floods reported in Kompong Preah, they often resort to "erosive" coping mechanisms. Approximately 18% of surveyed households admitted to using *"Taking children out of school or sending children to work"* as a direct response to climate-induced income failure. Gendered Impacts on Education: Qualitative follow-ups within the survey suggest that in households with limited liquidity, older male children are often withdrawn to provide manual farm labor, while female children may be withdrawn to assist with domestic duties while the mother engages in off-farm wage labor to compensate for rice crop loss.

4.3.2. The Multi-Dimensional Impact on Well-being

The impact of climate change on the household extends into health and psychological stress, which further hampers educational environments. Over 65% of respondents reported that climate shocks led to a "decline in food security," which is a primary driver of poor cognitive outcomes and school absenteeism among children in rural Battambang. Respondents consistently highlighted "Increased anxiety and stress" as a result of debt accrued through climate-related crop failure. This household instability creates a domestic environment where educational persistence is deprioritized in favor of immediate economic survival.

4.3.3. The Persistence of the Poverty Trap

This finding represents a significant "Climate Poverty Trap." While the Probit model identifies education as the most powerful driver for adopting Climate-Smart Agriculture (CSA), the very climate shocks that require these technologies are the same forces pulling the next generation out of school. There is a strong negative correlation between the severity of a reported flood event and the "Years of Schooling" expected for the children in those same households. These results suggest that climate resilience in Cambodia cannot be solved through agricultural training alone; it requires "social protection floors" that prevent families from sacrificing their children's education during extreme weather events.

Table 4.3. Prevalence of Education-Related Coping Strategies

Strategy	% of Households(N=100)	Severity Index
Withdraw children from school	18%	Critical
Increase child labor on farm	24%	High
Borrow from private lenders for fees	32%	Moderate
Reduce food consumption/quality	41%	High

Source: Authors' Calculation

4.4. Probit Regression Results

The transition from perceiving climate hazard to adopting a Climate-Smart Agriculture (CSA) technology is not automatic. To identify the structural and socio-economic drivers of this transition, we employed a Probit Regression Model. This model allows us to quantify the probability of a farmer adopting Stress-Tolerant Rice Varieties (STRVs), the primary proactive adaptation strategy identified in the Tonle Sap basin—based on a set of independent variables derived from our Conceptual Framework.

Table 4.4. Summary of Probit Model Results

Variable	Coeff.	Std. Error	P-Value
Education (Years)	0.124	0.041	0.002***
Gender (Female)	-0.082	0.038	0.045**
Extension Access	0.412	0.088	0.000***
Access to Credit	0.284	0.091	0.005***
Farm Size (Hectares)	0.015	0.012	0.112
Constant	*-1.045*	*0.215*	*0.000*

(N=200, Pseudo R^2 = 0.24, Log Likelihood = -84.2)

Source: Authors' Calculation

4.4.1. The Role of Human Capital

The most significant finding of the econometric model is the impact of Years of Schooling. Education was significant at the 1% level ($p < 0.01$). For every additional year of formal education, the probability of a household adopting STRVs increases by 12.4%. This suggests that formal education enhances "Information Processing Capacity." Farmers with more years of schooling are better equipped to interpret weather forecasts and technical manuals provided by extension services. In the context of Battambang's "Rice Bowl," education acts as a bridge that helps farmers cross the "Perception-Action Gap."

4.4.2. The Gender Agency Gap

The model highlights a persistent barrier for female respondents. When controlling for other factors, being Female remains a negative predictor for the independent adoption of new technologies. Female respondents were 3.1% less likely to be the primary adopters of CSA compared to their male counterparts. As established in our Kappa analysis, this is not due to a lack of risk awareness as women perceived droughts more acutely. Rather, this is a result of Structural Constraint. Women in

the study areas often lack formal land titles or the "final say" in household financial investments, which limits their ability to act on their perceptions.

4.4.3. Institutional and Financial Enablers

The model identifies two critical "External Stimuli" that significantly boost adoption rates:

- **Access to Extension Services**

  This was the strongest predictor in the model. Access to technical training sessions increased the probability of adoption by 41.2%. This underscores the vital role of institutional support in providing the "Technical Know-How" required for STRV cultivation.

- **Access to Credit**

  Households with access to formal credit or micro-finance were 12.1% more likely to adopt CSA. Given that stress-tolerant seeds and improved irrigation often require higher upfront costs than traditional methods, financial liquidity is a non-negotiable prerequisite for resilience.

4.5. Human Capital and the Pentagonal Strategy (Phase I)

The Royal Government of Cambodia's Pentagonal Strategy-Phase I places "People" as its first priority, focusing specifically on human capital development and digital transformation. The Probit model findings, where each year of schooling increases CSA adoption by 12.4%, directly validate the government's focus on strengthening the quality of education. However, the data highlights a "leaking pipeline": 18% of households are forced to withdraw children from school as a coping mechanism for climate shocks. This suggests that while the Pentagonal Strategy aims for higher education standards, climate volatility in the Tonle Sap basin is actively de-skilling the next generation. For the government to achieve its 2030 and 2050 visions, education policy must be coupled with Climate-Indexed Social Protection to keep children in school during flood and drought years.

4.6. TVET Programs and the Technical Skills Gap

The government's TVET programs aim to provide vocational training to households. The findings reveal that Extension Services provide a massive 41.2% boost to CSA adoption is a major endorsement of the TVET model. It suggests that targeted, non-formal technical training can "bypass" the barriers created by low formal schooling. These results provide the evidence needed to argue about a "Green TVET" curriculum. The training should not just focus on general mechanics or

services but specifically on the "Technical Know-How" of stress-tolerant rice varieties and water management identified in your survey.

4.7. Gender and the Climate Change Action Plan (GCCAP)

Cambodia has a dedicated Gender and Climate Change Action Plan, which aims to increase women's decision-making power in climate adaptation. The two Tonle Sap villages shows that women are deeply involved in climate-sensitive labor but are 3.1% less likely to adopt new technologies. This directly aligns with GCCAP's identification of "limited access to resources" as a barrier. The Kappa analysis (k = 0.42) on drought awareness shows that women have "early warning" insights that are often missed by men. Government policy should move beyond just "including" women in meetings to empowering them as Community Water Leads, utilizing their unique sensitivity to drought to trigger household-level adaptation earlier.

4.8. Agricultural Policy and the "Rice Bowl" Strategy

The Ministry of Agriculture, Forestry and Fisheries (MAFF) continue to prioritize rice exports and food security. The results show an extreme 92% dependency on rice. While the government promotes rice exports, the findings on "Rice Variety Changes" being a primary proactive strategy suggest that the government's Seed Policy is working. In addition, the Probit model shows that Credit Access boosts adoption by 12.1%. This highlights the importance of the Agricultural and Rural Development Bank (ARDB) providing low-interest "Climate Loans." Without this, the government's push for modernized agriculture will only reach the wealthiest farmers, leaving the 3.2-hectare smallholders our study behind.

Table 4.5. Summary of the alignment between research findings and policy implementation

Policy Area	Empirical Finding	Proposed Policy Adjustment
Education	18% school dropout rate during shocks.	Implement "Climate-Stay-in-School" grants for Tonle Sap communities.
Labor/TVET	Extension services give +41.2% adoption boost.	Integrate CSA modules into the TVET programs.
Gender	High drought awareness but low adoption agency.	Link micro-finance directly to female-led CSA projects.
Water Resource Management	Moderate spousal agreement on drought.	Establish village-level water committees with 50% female representation.

Source: Authors' Compilation

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1. The Socio-Economic Architecture of Resilience

The findings of this study provide a comprehensive understanding of how climate change is experienced and addressed within the smallholder households of Battambang. By moving away from a "unitary" household model and analyzing the individual perspectives of husbands and wives, we have uncovered the underlying socio-economic architecture that either facilitates or hinders climate adaptation.

The study concludes that climate awareness is not uniform within the household. While there is a synchronized understanding of high-magnitude events like flooding ($k = 0.61$), the moderate agreement on drought ($k = 0.42$) reveals a significant gendered “Information Gap.” Because women in these communities manage a wider portfolio of household resources, including water for domestic use and livestock, they act as "early detectors" of slow-onset climate stresses. This suggests that household-level adaptation is often delayed because risk is not viewed through a shared lens, confirming that gender is a mechanical filter for climate intelligence.

The results of the Probit model offer a definitive conclusion on the power of human capital. Formal schooling is the most consistent internal driver of Climate-Smart Agriculture (CSA) adoption, with every year of education providing a 5.2% probability boost in technology uptake. Education provides the cognitive tools necessary to transition from "Reactive Coping" (selling assets) to "Proactive Adaptation" (switching rice varieties). However, this engine is currently stalled by the "Gender Agency Gap," as female respondents remain significantly less likely to adopt new technologies despite their high levels of awareness, due to structural constraints in land rights and financial control.

Perhaps the most significant conclusion for national policy is the identification of the "Education-Climate Poverty Trap." The fact that 18% of households utilize child school withdrawal as a coping mechanism indicates that climate change is actively eroding the future adaptive capacity of Cambodia. In the Tonle Sap basin, the environment is not just damaging today’s crops; it is damaging tomorrow’s workforce. Without intervention, the very households that need education to adapt are the ones being forced to abandon it, creating a self-perpetuating cycle of vulnerability.

In summary, climate resilience in the "Rice Bowl" of Cambodia is not merely a technical challenge of better seeds or irrigation; it is a socio-economic challenge of education and equity. The transition to a climate-resilient agricultural sector requires a holistic approach that synchronizes the perceptions of men and women, leverages extension services as a form of non-formal education, and most importantly, protects the educational pathways of the next generation of farmers.

5.2. Strategic Recommendations for Climate Resilience

To address the structural vulnerabilities identified in this study, the following recommendations are proposed. These actions are designed to align with the Pentagonal Strategy (Phase I), ensuring that climate adaptation becomes a core component of Cambodia's human capital development.

Given that every year of schooling significantly increases the probability of adopting Climate-Smart Agriculture (CSA), protecting educational attainment must be a primary climate strategy. The Ministry of Education, Youth and Sport (MoEYS) should collaborate with the Ministry of Economy and Finance to implement "Climate-Stay-in-School" grants. These cash transfers should be triggered automatically during climate disasters to prevent the 18% of households currently resorting to child withdrawal from sacrificing their children's long-term potential for short-term survival. The TVET programs should move beyond general technical skills to include "Green Vocational Modules." These modules should provide specialized training in the technical management of stress-tolerant rice varieties (STRVs) and efficient water systems, effectively providing the 18.4% "adoption boost" found in our extension data to a national cohort of young farmers.

Our findings confirm that women are "early detectors" of climate risk, yet they face structural barriers to action. Policy must move from "participation" to "empowerment." The Ministry of Agriculture, Forestry and Fisheries (MAFF) should mandate that 50% of climate training participants be women. Extension services must be tailored to address the "Moderate Agreement" gap found in our Kappa analysis, specifically utilizing women's acute awareness of drought to trigger earlier household-level adaptation. To overcome the 3.1% adoption gap for women, joint land titling must be accelerated. Providing women with formal collateral will unlock access to the ARDB's agricultural credit, which our model shows, increases the likelihood of technology adoption by 12.1%.

To transition from reactive coping to proactive adaptation, the financial and institutional environment must support smallholder risk-taking. The government should incentivize micro-finance institutions (MFIs) to offer lower-interest loans specifically for the purchase of CSA-certified inputs. By lowering the "entry cost" of adaptation, the government can leverage the 12.1% credit-adoption link identified in this study to modernize the Tonle Sap's agricultural sector. Establishing village-level water committees in Battambang, with mandatory representation from both husbands and wives, will ensure

that the "Perceptual Gaps" identified in Section 5.2 are bridged. Shared risk assessment leads to shared investment in collective assets like community ponds and irrigation dikes.

Finally, a five-year tracer study should be conducted on this respondent cohort to measure whether the adoption of CSA successfully protected household human capital (schooling) through subsequent flood and drought cycles. National labor sector monitoring should integrate "Climate Vulnerability Indicators" into its cohort analysis, ensuring that TVET programs can dynamically adjust its training locations based on real-time environmental stress in provinces like Battambang.

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APPENDICES

1. Survey Questionnaires

Survey Questionnaire

Angkor University and The Royal University of Phnom Penh

Education and Gender-Based Perceptions and Adaptation to Climate Change

DATE:_____

Introduction

Good morning/afternoon! My name is _____ from (name of institution). We are conducting a household survey of farmers to see the farmers' perception on climate change with respect to gender, education, socio-economic and social ethnical groups and their adaptive capacity.

Area of study:

Village: _____
Commune:_____
District: _____
Province: _____
Contact Number/s: _____

FOR SECTIONS I-III, MALE AND FEMALE RESPONDENTS WILL BE ASKED TOGETHER.

I. Characteristics of Respondent

Household (HH) Head		Spouse/ Opposite gender of the HH Head (if spouse not available/ not applicable)	
Name:		Name:	
Gender:			
Year of birth:		Year of birth:	
Number of years in school:		Number of years in school:	
Year started rice farming:		Year started rice farming:	
Religion:		Religion:	
Ethnic Group:		Ethnic Group:	
Occupation:		Occupation:	

Household Size
Total Household Size: _____
From the household members working on farm, how many are…?
a)…less than 18 years old? _____ b) …equal or more than 18 years old? _____
From the household members working nonfarm, how many are…?
a)…less than 18 years old? _____ b) …equal or more than 18 years old? _____

II. Farm Characteristics

Total farm size (m^2):			Total paddy area (m^2):		
Type of ownership:	1□ Owned (m^2):		Type of ownership:	1□ Owned (m^2):	
	2□ Rented in (m^2):			2□ Rented in (m^2):	
	99□ Others (m^2):			99□ Others (m^2):	

Rice production

Season	Season period (what months?)	Paddy area planted (m^2)	Type of ecosystem	Paddy productivity (kg/m^2)
1st crop	From .....to.....		1□ Irrigated 2□ Rainfed 3□ Partially irrigated	
2nd crop	From .....to.....		1□ Irrigated 2□ Rainfed 3□ Partially irrigated	
3rd crop (if applicable)	From .....to.....		1□ Irrigated 2□ Rainfed 3□ Partially irrigated	

Livestock, Poultry and Aquaculture currently owned

Animal	Quantity (heads)	Aquaculture	Land (m^2)
Buffaloes		Fish	
Cows		Others:	
Pigs			
Chicken			
Ducks			
Others:			

III. Household Income

Source	Annual income (Riel or USD)	Source	Annual income (Riel or USD)
Rice		Off-farm income [1]	
Other crops		Non-farm income [2] (specify)	
Pigs			
Poultry		Others (specify)	
Fisheries			

[1/]Off farm income refers to any source of agricultural income that is earned away from the family farm, as in the case of agricultural wage labor.

[2/] Nonfarm income refers to any source of income not generated through farm or agricultural activities.

FOR THE SUCCEEDING SECTIONS, MALE AND FEMALE ARE ASKED SEPARATELY.

FORM A (MALE'S FORM, p. 3-12)

IV. Climate Variability

1. Have you noticed any change in weather from the past 10 years?	1☐ Yes 0☐ No (proceed to section **V**)

2. What are the changes that you have noticed for the past 10 years…?
(Multiple responses possible. From the chosen responses, which is the MOST significant change for every category/column? Kindly encircle.)

a)…in temperature	b) …in rainfall	c) ….in drought	d)…in floods
1☐ Increase	1☐ Early rainfall	1☐ Early drought	1☐ Frequent flood
2☐ Decrease	2☐ Late rainfall	2☐ Late drought	2☐ Less frequent flood
3☐ Colder during cold months	3☐ Low rainfall	3☐ Low drought	3☐ Unexpected flood incidence
4☐ Hotter during hot months	4☐ High rainfall	4☐ High drought	4☐ None
5☐ None	5☐ None	5☐ None	6☐ Irregular change
6☐ Irregular change	6☐ Irregular change	6☐ Irregular change	99☐ Others:
99☐ Others:	99☐ Others:	99☐ Others:	

3. What do you think are the reasons for the changes that you have observed? *(Multiple responses possible.)*	1 ☐ Mankind activities 2 ☐ Non-mankind activities 3 ☐ None 99☐ Others:

V. Climate Stress and the Resulting Changes

1. Which of the following stresses are present in your area? *(Multiple responses possible. Kindly encircle the stress that MOSTLY affected your area or MOST common in your area.)*	1☐ Flood 2☐ Storms 3☐ Salinity	4☐ Drought 5☐ Heat 6☐ Sea level rise	7☐ None (proceed to **IX**) 99☐ Others:

NOTE: ALL THE QUESTIONS BELOW REFER TO THEIR ANSWER IN THE PREVIOUS QUESTION- THE STRESS THAT MOSTLY AFFECTED THE AREA OR MOST COMMON IN THE AREA.

2. Does the severity of this stress change over time?	1☐ Yes 0☐ No (proceed to **5**)		
3. How does the severity of this stress change?	1☐ Lessened (proceed to **5**) 2☐Worsened		
4. When did the severity of this stress start to worsen?	1☐ a year ago 2☐ 2 years ago	3☐ 3 years ago 4☐ 4 years ago	5☐ 5years ago 6☐ more than 5 years ago

5. RICE (own production)

During this stress, what is the change in:		Percent change
a) The paddy area you plant?	1☐ Increased 2☐Decreased 0☐ No change	
b) The paddy area you harvest?	1☐ Increased 2☐Decreased 0☐ No change	
c) The paddy yield you get?	1☐ Increased 2☐Decreased 0☐ No change	

6. LIVESTOCK (own production)

a) Does this stress affect your livestock production?	1☐ Yes 0☐ No (proceed to **7**) 88☐ Not applicable (proceed to **7**)
b) How does this stress affect the available meat for home consumption?	1☐ Increased 0 ☐ No change 2☐ Decreased 88☐ Not applicable
c) How does this stress affect the available meat for selling?	1☐ Increased 0 ☐ No change 2☐ Decreased 88☐ Not applicable
d) How does this stress affect the available milk for home consumption?	1☐ Increased 0 ☐ No change 2☐ Decreased 88☐ Not applicable
e) How does this stress affect the available milk for selling?	1☐ Increased 0 ☐ No change 2☐ Decreased 88☐ Not applicable
f) How does this stress affect the hay or straw (fodder) as feed for animals?	1☐ Increased 0 ☐ No change 2☐ Decreased 88☐ Not applicable
g) How does this stress affect the occurrence of livestock disease?	1☐ Increased 0 ☐ No change 2☐ Decreased 88☐ Not applicable
h) How does this stress affect the livestock mortality?	1☐ Increased 0 ☐ No change 2☐ Decreased 88☐ Not applicable

7. AQUACULTURE (own production)

a) Does this stress affect your aquaculture production?	1☐ Yes 0☐ No (proceed to **8**) 88☐ Not applicable (proceed to **8**)
b) How does this stress affect the production of fish catch?	1☐ Increased 0 ☐ No change 2☐ Decreased 88☐ Not applicable
c) How does this stress affect the production of shrimp catch?	1☐ Increased 0 ☐ No change 2☐ Decreased 88☐ Not applicable
d) How does this stress affect the quality of fish catch?	1☐ Increased 0 ☐ No change 2☐ Decreased 88☐ Not applicable
e) How does this stress affect the quality of shrimp catch?	1☐ Increased 0 ☐ No change 2☐ Decreased 88☐ Not applicable

8. IRRIGATION

a) Does this stress affect irrigation in your farm?	1☐ Yes 0☐ No (proceed to **9**) 88☐ Not applicable (proceed to **9**)		
b) How does this stress affect irrigation system in your farm?			
c) What is the main source of the irrigation water in your farm?	1☐ Canal	3☐ Dikes	5☐ General
	2☐ Public wells	4☐ Gates	99☐ Others:
d) Do you change the source of your irrigation water during this stress?	1☐ Yes 0☐ No (proceed to **9**)		
e) What is new source of your irrigation water?	1☐ Canal	3☐ Dikes	5☐ General
	2☐ Public wells	4☐ Gates	99☐ Others:

9. FOOD

a) Do you keep your own produced paddy for home consumption?	1☐ Yes 0☐ No (proceed to **e**)
b) In a year without severe stress, how many months and tons is rice available for home consumption (without saving sacks of rice for emergency purposes/ calamities) coming from your own production?	Months:..... Tons:.....
c) During a year with severe stress, how many months and tones is rice available for home consumption (without saving sacks of rice for emergency purposes/ calamities) coming from your own production?	Months:..... Tons:.....
d) Was the amount of own produced rice that you eat in times of a stress sufficient?	1☐ Yes 0☐ No
e) Do you afford to buy rice during this stress?	1☐ Yes 2☐ We do not buy rice (proceed to **10**) 0☐ No
f) What is the change in the amount of rice you buy during stress?	1☐ Increased 2☐ Decreased 0☐ No change
g) What is the change in the availability of rice in the market during stress?	1☐ Increased 2☐ Decreased 0☐ No change
h) What is the change in the quality of rice you buy during stress?	1☐ Improved 2☐ Worsened 0☐ No change

10. DRINKING WATER

a) Do you buy drinking water for normal days?	1☐ Yes 0☐ No
b) What is the source of your drinking water?	
c) Did the source of your drinking water change during this stress?	1☐ Yes 0☐ No (proceed to **11**)
d) What is the new source of your drinking water during this stress?	

11. HUMAN HEALTH

a) Is your health affected during this stress?	1☐ Yes 0☐ No		
b) What are the common health problems in the family during this stress? *(Multiple responses possible. From the responses given, which is the MOST common health problem? Kindly encircle.)*	**Flu** 1☐ Flu 2☐ Colds 3☐ Cough 4☐ Sniffles 5☐ Headache 6☐ Sore throat **Bowel problems** 17☐ Typhoid 18☐ Diarrhea 19☐ Stomachache 20☐ Bilharzia 31☐ **NONE** (proceed to 12) 99☐ Others:	**Heart, blood pressure problem** 7 ☐ High blood pressure 8 ☐ Low blood pressure 9 ☐ Heart attack 10☐ Glycosuria 11☐ Myocardial **Lung/liver problems** 21☐ Tuberculosis 22☐ Pneumonia 23☐ Lung cancer 24☐ Hepatitis 25☐ Liver complain	**Bone problem** 12☐ Sprain 13☐ Broken bone 14☐ Arthritis 15☐ Osteoporosis 16☐ Rheumatism **Skin disease** 26☐ Allergy 27☐ Scabies 28☐ Smallpox 29☐ Zoster 30☐ Acne
c) Who among the family are mostly affected with health problems due to this stress? *(Multiple responses possible.)*	1☐ Husband 2☐ Wife 3☐ Both husband and wife 4☐ Children	5☐ Elders 6☐ ALL 99☐ Others:	
d) How does the changing severity of this stress affect the health status of the mostly affected household member?	1☐ Improved 2☐ Worsened 0☐ No change		

12. ACCESS TO FINANCE

a) Did you or any of your family take a loan in case of this stress? 1□ Yes 0□ No (proceed to **13**)

b) What are the main sources of your loan?
(Multiple responses possible. From the responses given, which is the source your loan is MOSTLY being acquired? Kindly encircle)

1□ Commercial banks	4□ Relatives
2□ Microfinance institutions (MFIs)	5□ Friends
3□ Private money lenders	6□ Information Credit Scheme (Tontin)
	99 □ Others

c) Is there a change in the amount of loan being acquired during this stress? 1□ Increased 2□ Decreased 0□ No change

d) Who borrows most of the time during the stress?

1□ Husband	5□ Elders
2□ Wife	6□ ALL
3□ Both husband and wife	99□ Others:
4□ Children	

e) Do you use the sources you chose above as the same loan sources during this stress? 1□ Yes (proceed to **g**) 0□ No

f) What are the sources of your loan during this stress?
(Multiple responses possible. Kindly encircle)

1□ Social Policy Bank	7 □ Veteran's Union	13 □ Relatives
2□ Bank for Agriculture & Rural Development	8 □ Women's Union	14 □ Friends
3□ Other state owned commercial bank	9 □ People's Credit Funds	15 □ Informal Credit Scheme
4□ Private Bank	10□ Other Credit Associations	99 □ Other:
5□ Local authorities	11 □ Private Trader	
6 □ Farmer's Union	12 □ Private Money Lender	

g) The loan acquired during this stress is for what purposes?
(Multiple responses possible. From the responses given, which is the MOST important reason for acquiring the loan? Kindly encircle)

Stated purposes	**Real purposes**
1□ Rice	1□ Rice
2□ Other crop production (including inputs)	2□ Other crop production (including inputs)
3□ Animal husbandry	3□ Animal husbandry
4□ Forestry	4□ Forestry
5□ Fishery	5□ Fishery
6□ Non-farm activity	6□ Non-farm activity
7□ Repay other loan	7□ Repay other loan
8□ Build/buy house	8□ Build/buy house
9□ Buy land	9□ Buy land
10□ Buy another asset	10□ Buy another asset
99□ Others:	11□ Pay for wedding/funeral
	12□ Education expenses
	13□ Health expenses
	14□ General consumption
	99□ Others:

13. LABOR ACTIVITIES

a) Do you provide labor in farm and nonfarm activities?	1□ Yes 0□ No (proceed to section **VI**)

b) Please indicate the change in your time spent on the specific activities listed below during this stress.
CODE: 1-Increased 2- Decreased 0- No change 88- Not applicable

b1) Rice Production		**b2) Other crop production** 88□	
Seed Selection	1□ 2□ 0□ 88□	Seed Selection	1□ 2□ 0□ 88□
Seedbed Preparation	1□ 2□ 0□ 88□	Seedbed Preparation	1□ 2□ 0□ 88□
Land Preparation	1□ 2□ 0□ 88□	Land Preparation	1□ 2□ 0□ 88□
Transplanting	1□ 2□ 0□ 88□	Transplanting	1□ 2□ 0□ 88□
Broadcasting	1□ 2□ 0□ 88□	Broadcasting	1□ 2□ 0□ 88□
Weeding	1□ 2□ 0□ 88□	Weeding	1□ 2□ 0□ 88□
Threshing	1□ 2□ 0□ 88□	Threshing	1□ 2□ 0□ 88□
Drying	1□ 2□ 0□ 88□	Drying	1□ 2□ 0□ 88□
Removing off-types	1□ 2□ 0□ 88□	Removing off-types	1□ 2□ 0□ 88□
Seed selection for next cropping season	1□ 2□ 0□ 88□	Seed selection for next cropping season	1□ 2□ 0□ 88□
Storing seeds	1□ 2□ 0□ 88□	Storing seeds	1□ 2□ 0□ 88□
Purchase of inputs	1□ 2□ 0□ 88□	Purchase of inputs	1□ 2□ 0□ 88□
Selling of produce	1□ 2□ 0□ 88□	Selling of produce	1□ 2□ 0□ 88□
Supervision of hired labor	1□ 2□ 0□ 88□	Supervision of hired labor	1□ 2□ 0□ 88□
Bringing food to the farm	1□ 2□ 0□ 88□	Bringing food to the farm	1□ 2□ 0□ 88□
Application of chemicals	1□ 2□ 0□ 88□	Application of chemicals	1□ 2□ 0□ 88□
Harvesting	1□ 2□ 0□ 88□	Harvesting	1□ 2□ 0□ 88□
Others:	1□ 2□ 0□ 88□	Others:	1□ 2□ 0□ 88□
b3) Livestock Management 88□		**b4) Aquaculture** 88□	
Cleaning the animal sheds	1□ 2□ 0□ 88□	Catching of fish	1□ 2□ 0□ 88□
Collecting green fodder	1□ 2□ 0□ 88□	Catching of shrimp	1□ 2□ 0□ 88□
Preparing (chop) green fodder	1□ 2□ 0□ 88□	Selling of fish	1□ 2□ 0□ 88□
Grazing large animals	1□ 2□ 0□ 88□	Selling of shrimp	1□ 2□ 0□ 88□
Taking care of pigs	1□ 2□ 0□ 88□	Others:	1□ 2□ 0□ 88□
Taking care of poultry	1□ 2□ 0□ 88□	**b6) Household activities** 88□	
Selling large animals	1□ 2□ 0□ 88□	Child rearing	1□ 2□ 0□ 88□
Selling of small animals	1□ 2□ 0□ 88□	Cleaning the house	1□ 2□ 0□ 88□
Selling of poultry	1□ 2□ 0□ 88□	Washing of clothes	1□ 2□ 0□ 88□
Others:	1□ 2□ 0□ 88□	Cooking	1□ 2□ 0□ 88□
b5) Non farm labor 88□		Others:	1□ 2□ 0□ 88□
Government	1□ 2□ 0□ 88□		
State owned enterprise	1□ 2□ 0□ 88□		
Public work program	1□ 2□ 0□ 88□		
Collective	1□ 2□ 0□ 88□		
Private individual/household	1□ 2□ 0□ 88□		
Cambodian private firm	1□ 2□ 0□ 88□		
Foreign private firm	1□ 2□ 0□ 88□		

Others:	1□ 2□ 0□ 88□

VI. Climate Stress and Impacts

1. What are the impacts of the severity of this stress to your rice production?	1☐ Low yields	4☐ Increase indebtedness
	2☐ Crop loss	5☐ None
	3☐ Food insecurity	99☐ Others

2. Are the impacts (listed below) due to this stress negatively affecting MEN's lives? From the list, which is the impact that negatively affected men's lives the MOST? *(Kindly tick.)*

Impact	Affected		Unaffected
	Highly	Slightly	
1☐ Increased health problems			
2☐ Increased disagreements among family members			
3☐ Increased pressure to provide food for the family			
4☐ Pressure to hire labor			
5☐ Pressure to hire machineries			
6☐ Pressure to acquire loans			
7☐ More stressed/ anxious			
99☐ Others(specify):			

3. Are the impacts (listed below) due to this stress negatively affecting WOMEN's lives? From the list, which is the impact that negatively affected men's lives the MOST? *(Kindly tick.)*

Impact	Affected		Unaffected
	Highly	Slightly	
1☐ Increased health problems			
2☐ Increased disagreements among family members			
3☐ Increased pressure to provide food for the family			
4☐ Pressure to hire labor			
5☐ Pressure to hire machineries			
6☐ Pressure to acquire loans			
7☐ More stressed/ anxious			
99☐ Others(specify):			

VII. Institutional Support

1. Do you get any support during this stress?	1☐ Yes 0☐ No (proceed to **3**)		
2. a) What kind of support do you get?	**2. b)** What are the sources of this support?		
1☐ Housing	**a) Government** 1☐Central government 2☐Local government 3☐State owned bank 4☐Commercial bank 99☐Others:	**b) Institutions** 5☐International organization 6☐NGO 7☐Private organization 99☐Others:	**c) Farmer Union** 8☐Civil society 9☐Farmer's association 10☐Cooperative 11☐Interest group 99☐Others:
2☐ Relief goods ration	**a) Government** 1☐Central government 2☐Local government 3☐State owned bank 4☐Commercial bank 99☐Others:	**b) Institutions** 5☐International organization 6☐NGO 7☐Private organization 99☐Others:	**c) Farmer Union** 8☐Civil society 9☐Farmer's association 10☐Cooperative 11☐Interest group 99☐Others:
3☐ Credit	**a) Government** 1☐Central government 2☐Local government	**b) Institutions** 5☐International organization	**c) Farmer Union** 8☐Civil society

	3□State owned bank 4□Commercial bank 99□Others:	6□NGO 7□Private organization 99□Others:	9□Farmer's association 10□Cooperative 11□Interest group 99□Others:
4□ Health insurance	**a) Government** 1□Central government 2□Local government 3□State owned bank 4□Commercial bank 99□Others:	**b) Institutions** 5□International organization 6□NGO 7□Private organization 99□Others:	**c) Farmer Union** 8□Civil society 9□Farmer's association 10□Cooperative 11□Interest group 99□Others:
5□ Training on new rice technologies	**a) Government** 1□Central government 2□Local government 3□State owned bank 4□Commercial bank 99□Others:	**b) Institutions** 5□International organization 6□NGO 7□Private organization 99□Others:	**c) Farmer Union** 8□Civil society 9□Farmer's association 10□Cooperative 11□Interest group 99□Others:
6□ Support for farming activities	**a) Government** 1□Central government 2□Local government 3□State owned bank 4□Commercial bank 99□Others:	**b) Institutions** 5□International organization 6□NGO 7□Private organization 99□Others:	**c) Farmer Union** 8□Civil society 9□Farmer's association 10□Cooperative 11□Interest group 99□Others:
99□ Others:	**a) Government** 1□Central government 2□Local government 3□State owned bank 4□Commercial bank 99□Others:	**b) Institutions** 5□International organization 6□NGO 7□Private organization 99□Others:	**c) Farmer Union** 8□Civil society 9□Farmer's association 10□Cooperative 11□Interest group 99□Others:

3. What kind of support do you expect from the government during this stress? *(List the 3 most important in descending order.)*	1.		
	2.		
	3.		
4. Do you have access to information about **cropping pattern/ agronomic practice**?	1□ Yes 0□ No (proceed to **6**)		
5. What are the sources of your information about cropping pattern/ agronomic practices? *(Multiple responses possible.)*	1□Government Organizations 2□NGOs (name:_____) 3□Private organizations 4□Universities 5□Research institutions	6□Radio 7□Newspaper 8□Television 9□Traditional knowledge	10□Neighbor 11□Other farmers 12□Family member 99□Others:
6. Do you have access to information about **aquaculture activities**?	1□ Yes 0□ No (proceed to **8**)		
7. What are the sources of your information about aquaculture activities? *(Multiple responses possible.)*	1□Government Organizations 2□NGOs (name:_____) 3□Private organizations 4□Universities 5□Research institutions	6□Radio 7□Newspaper 8□Television 9□Traditional knowledge	10□Neighbor 11□Other farmers 12□Family member 99□Others:
8. Do you have access to information about **weather condition**?	1□ Yes 0□ No (proceed to **VIII**)		

9. What are the sources of your information about weather condition? *(Multiple responses possible.)*	1☐Government Organizations 2☐NGOs (name:_______________) 3☐Private organizations 4☐Universities 5☐Research institutions	6☐Radio 7☐Newspaper 8☐Television 9☐Traditional knowledge	10☐Neighbor 11☐Other farmers 12☐Family member 99☐Others:

VIII. Adaptation and Coping Strategies

1. What coping strategies do you do in response to negative impacts of this stress? *(Multiple responses possible. From the responses given, which is the MOST important strategy that you do? Kindly encircle).*	1☐ Nothing 2☐ Reduced consumption 3☐ Sold land 4☐ Sold livestock 5☐ Sold other assets 6☐ Got assistance from relatives or friends	7☐ Got assistance from government 8☐ Got assistance from NGO 9☐ Borrowed money from bank 10☐ Borrowed from others 11☐ Got insurance payment	12☐ Postponed payment of loan 13☐ Work more 14☐ Took children out of school/ Sent children to work 15☐ Use savings 99☐ Others:
2. What changes in your farming activities did you do during this stress? *(Multiple responses possible. From the responses chosen, which is the MOST important change that you do? Kindly encircle)*	1☐ Change in cropping pattern 2☐ Change in rice variety 3☐ Shift from crops to livestock 4☐ Grow more kinds of crops 5☐ Grow dry fodder crops 6☐ Crop relocation	7☐ Leave as fallow 8☐ No change 99☐ Others:	

3. What are the important factors in your decision to change your commonly used...? *(Multiple responses possible. From the responses chosen, which is the MOST significant factor? Kindly encircle.)*	a) ...rice variety?	b) ...cropping pattern?	c) ...cropping calendar?
	1☐ Good yield 2☐ Tolerance to stress 3☐ Recommendation of government 4☐ Capital 5☐ Availability of water 6☐ Market demand 7☐ Availability and access to inputs 8☐ Farm harvest price 9☐ Physical factors (Soil and climatic conditions) 99☐ Others:	1☐ Good yield 2☐ Tolerance to stress 3☐ Recommendation of government 4☐ Capital 5☐ Availability of water 6☐ Market demand 7☐ Availability and access to inputs 8☐ Farm harvest price 9☐ Physical factors (Soil and climatic conditions) 99☐ Others:	1☐ Good yield 2☐ Tolerance to stress 3☐ Recommendation of government 4☐ Capital 5☐ Availability of water 6☐ Market demand 7☐ Availability and access to inputs 8☐ Farm harvest price 9☐ Physical factors (Soil and climatic conditions) 99☐ Others:

4. Will you consider the following technologies as part of your strategies to cope with climate change challenges?

Strategies	Yes	No
Use of stress-tolerant varieties		
Shift to improved cropping system		
Changes in varieties		
New land management techniques (i.e. zero tillage for rice wheat; resource conserving techniques)		
Changes in water-management (alternated wetting and drying method, underground tanks, bamboo stems for drip irrigation)		
Pest and disease management techniques		
Development and use of crop varieties resistant to pests and diseases		
New livestock breeds		
Improved animal health management		
Changing crop calendar		
Changing level of input used (fertilizers, seed, etc.)		
Crop rotation		
Others (specify)		
None		

5. What trainings do you need to enhance your skills and knowledge to better adopt the above mentioned interventions? *(Multiple responses possible. From the responses chosen, which is the MOST significant training do you need? Kindly encircle.)*	1☐ Seed health management 2☐ Water management 3☐ Crop production management 4☐ Crop nutrient management 5☐ Pest management 6☐ Post harvest including storage 7☐ Animal management 99☐ Other income generation:

IF PREVIOUS SECTION HAS ANSWERS, PLEASE SKIP SECTION IX. SECTION IX IS MAINLY FOR RESPONDENTS WHO ANSWERED NONE IN SECTION V QUESTION #1.

IX. Adaptation and Coping Strategies (*Only for Respondents observing no climate stress in the area*)

1. What coping strategies will you do in response to negative impacts in case of a stress? *(Multiple responses possible. From the responses given, which is the MOST important strategy that you will do? Kindly encircle).*	1☐ Nothing 2☐ Reduced consumption 3☐ Sold land 4☐ Sold livestock 5☐ Sold other assets 6☐ Got assistance from relatives or friends	7☐ Got assistance from government 8☐ Got assistance from NGO 9☐ Borrowed money from bank 10☐ Borrowed from others 11☐ Got insurance payment	12☐ Postponed payment of loans 13☐ Work more 14☐ Took children out of school/ Sent children to work 15☐ Use savings 99☐ Others:
2. What changes in your farming activities will you do in case of a stress? *(Multiple responses possible. From the responses chosen, which is the MOST important change that you will do? Kindly encircle)*	1☐ Change in cropping pattern 2☐ Change in rice variety 3☐ Shift from crops to livestock 4☐ Grow more kinds of crops 5☐ Grow dry fodder crops 6☐ Crop relocation 7☐ Leave as fallow 8☐ No change	99☐ Others:	

3. What are the important factors in your decision to change your	d) ...rice variety?	e) ...cropping pattern?	f) ...cropping calendar?
	1☐ Good yield 2☐ Tolerance to stress	1☐ Good yield 2☐ Tolerance to stress	1☐ Good yield 2☐ Tolerance to stress

commonly used...? *(Multiple responses possible. From the responses chosen, which is the MOST significant factor? Kindly encircle.)*	3☐ Recommendation of government 4☐ Capital 5☐ Availability of water 6☐ Market demand 7☐ Availability and access to inputs 8☐ Farm harvest price 9☐ Physical factors (Soil and climatic conditions) 99☐ Others:	3☐ Recommendation of government 4☐ Capital 5☐ Availability of water 6☐ Market demand 7☐ Availability and access to inputs 8☐ Farm harvest price 9☐ Physical factors (Soil and climatic conditions) 99☐ Others:	3☐ Recommendation of government 4☐ Capital 5☐ Availability of water 6☐ Market demand 7☐ Availability and access to inputs 8☐ Farm harvest price 9☐ Physical factors (Soil and climatic conditions) 99☐ Others:

4. Will you consider the following technologies as part of your strategies to cope with climate change challenges?

Strategies	Yes	No
Use of stress-tolerant varieties		
Shift to improved cropping system		
Changes in varieties		
New land management techniques (i.e. zero tillage for rice wheat; resource conserving techniques)		
Changes in water-management (alternated wetting and drying method, underground tanks, bamboo stems for drip irrigation)		
Pest and disease management techniques		
Development and use of crop varieties resistant to pests and diseases		
New livestock breeds		
Improved animal health management		
Changing crop calendar		
Changing level of input used (fertilizers, seed, etc.)		
Crop rotation		
Others (specify)		
None		

5. What trainings do you need to enhance your skills and knowledge to better adopt the above mentioned interventions? *(Multiple responses possible. From the responses chosen, which is the MOST significant training do you need? Kindly encircle.)*	1☐ Seed health management 2☐ Water management 3☐ Crop production management 4☐ Crop nutrient management 5☐ Pest management 6☐ Post harvest including storage 7☐ Animal management 99☐ Other income generation:

-END OF MALE'S FORM-

FORM B (FEMALE'S FORM)

-END OF FEMALE'S FORM-

-END OF SURVEY QUESTIONNAIRE-

2. Survey Questionnaire (in Khmer)

សាកលវិទ្យាល័យអន្តរ និងសាកលវិទ្យាល័យភូមិន្ទភ្នំពេញ

ការអប់រំ និងការយល់ឃើញ ផ្អែកលើយេនឌ័រ និងការសម្របខ្លួនទៅនឹងការប្រែប្រួលអាកាសធាតុ

កាលបរិច្ឆេទ៖ _____

សេចក្តីផ្តើម

អរុណសួស្តី/សាយ័ន្តសួស្តី! ខ្ញុំបាទ/នាងខ្ញុំឈ្មោះ _____ មកពី (ឈ្មោះស្ថាប័ន)។ យើងកំពុងធ្វើការស្ទង់មតិតាមគ្រួសាររបស់កសិករ ដើម្បីមើលឃើញពីការយល់ឃើញរបស់កសិករ ទៅលើការប្រែប្រួលអាកាសធាតុទាក់ទងនឹងយេនឌ័រ ការអប់រំ សេដ្ឋកិច្ចសង្គម និងក្រុមសង្គមជនជាតិភាគតិច និងសមត្ថភាពក្នុងការសម្របខ្លួនរបស់ពួកគេ។

តំបន់សិក្សា៖

ភូមិ៖_____

ឃុំ៖ _____

ស្រុក៖_____

ខេត្ត៖ _____

លេខទំនាក់ទំនង៖ _____

សម្រាប់ផ្នែក I-III អ្នកឆ្លើយតបជាបុរស និងស្ត្រីនឹងត្រូវបានសួរជាមួយគ្នា

X. លក្ខណៈពិសេសនៃអ្នកឆ្លើយតប

មេគ្រួសារ (HH)		ប្តីប្រពន្ធ/ភេទផ្ទុយរបស់មេគ្រួសារ (ប្រសិនបើដៃគូអវត្តមាន / មិនអាចប្រើបាន)	
ឈ្មោះ៖		ឈ្មោះ៖	
ភេទ៖			
ឆ្នាំកំណើត៖		ឆ្នាំកំណើត៖	
ចំនួនឆ្នាំសិក្សា៖		ចំនួនឆ្នាំសិក្សា៖	
ឆ្នាំដែលចាប់ផ្តើមធ្វើស្រែ៖		ឆ្នាំដែលចាប់ផ្តើមធ្វើស្រែ៖	
សាសនា៖		សាសនា៖	
ក្រុមជនជាតិ៖		ក្រុមជនជាតិ៖	
មុខរបរ៖		មុខរបរ៖	
ទំហំគ្រួសារ ទំហំគ្រួសារសរុប៖ _____ សមាជិកគ្រួសារដែលធ្វើស្រែចំការ តើមានប៉ុន្មាននាក់...? b) ...អាយុតិចជាង 18 ឆ្នាំ? _____ ខ) ... ស្មើ ឬលើសពី 18 ឆ្នាំ? _____ សមាជិកគ្រួសារដែលធ្វើការក្រៅកសិកម្ម តើមានប៉ុន្មាននាក់...?			

b) ...អាយុតិចជាង 18 ឆ្នាំ? _____ ខ) ... ស្មើ ឬលើសពី 18 ឆ្នាំ? _____

XI. លក្ខណៈកសិកម្ម

ទំហំដីកសិដ្ឋានសរុប (ម^{2})			ផ្ទៃដីស្រែសរុប (ម^{2})		
ប្រភេទនៃកម្មសិទ្ធិ៖	1 □ ម្ចាស់កម្មសិទ្ធិ (ម^{2})		ប្រភេទនៃកម្មសិទ្ធិ៖	1 □ ម្ចាស់ (ម^{2})	
	2 □ ជួល (ម^{2})			2 □ ជួល (ម^{2})	
	99 □ ផ្សេងៗទៀត (ម^{2})			3 □ ផ្សេងៗទៀត (ម^{2})	

ផលិតកម្មស្រូវ

រដូវ	កាលរដូវ (ខែណា?)	ផ្ទៃដីដាំដុះ (ម^{2})	ប្រភេទនៃប្រព័ន្ធអេកូឡូស៊ី	ផលិតភាពស្រូវ (គីឡូក្រាម/ម^{2})
លើកទី១	ពី..... ដល់.....		1 □ ប្រព័ន្ធស្រោចស្រព 2 □ ភ្លៀង 3□ប្រព័ន្ធស្រោចស្រពខ្លះ	
លើកទី២	ពី..... ដល់.....		1 □ ប្រព័ន្ធស្រោចស្រព 2 □ ភ្លៀង 3□ប្រព័ន្ធស្រោចស្រពខ្លះ	
លើកទី៣ (ប្រសិនបើមាន)	ពី..... ដល់.....		1 □ ប្រព័ន្ធស្រោចស្រព 2 □ ភ្លៀង 3□ប្រព័ន្ធស្រោចស្រពខ្លះ	

សត្វពាហនៈ បក្សីដែលមានម្ចាស់បច្ចុប្បន្ន

សត្វ	បរិមាណ (ក្បាល)	វារីវប្បកម្ម	ដី (ម^{2})
ក្របី		ត្រី	
គោ		ផ្សេងៗ៖	
ជ្រូក			
មាន់			
ទា			
ផ្សេងៗ៖			

XII. ប្រាក់ចំណូលគ្រួសារ

ប្រភព	ប្រាក់ចំណូលប្រចាំឆ្នាំ (ដុល្លារ)	ប្រភព	ប្រាក់ចំណូលប្រចាំឆ្នាំ (ដុល្លារ)
អង្ករ		ប្រាក់ចំណូលក្រៅកសិដ្ឋាន[1]	
ដំណាំផ្សេងៗ		ប្រាក់ចំណូលមិនមែនកសិកម្ម[2] (បញ្ជាក់)	
ជ្រូក			
បក្សី		ផ្សេងៗ (បញ្ជាក់)	
ត្រី(ផលនេសាទ)			

[1] ប្រាក់ចំណូលក្រៅពីកសិដ្ឋាន សំដៅលើប្រភពប្រាក់ចំណូលណាមួយដែលរកបានក្រៅពីកសិដ្ឋានគ្រួសារដូចករណីប្រាក់ឈ្នួលពលកម្មកសិកម្ម។

[2] ប្រាក់ចំណូលមិនមែនកសិកម្ម សំដៅលើប្រភពចំណូលណាមួយដែលមិនបានបង្កើតតាមរយៈសកម្មភាពកសិកម្ម ឬកសិកម្ម។

សម្រាប់ផ្នែកបន្ទាប់ សំនួរបុរស និងស្ត្រីត្រូវបានសួរដោយឡែកពីគ្នា។

ទម្រង់ A (**ទម្រង់របស់បុរស**)

XIII. **ការប្រែប្រួលអាកាសធាតុ**

1. តើអ្នកបានធ្វើការកត់សម្គាល់ឃើញពីការប្រែប្រួលអាកាសធាតុក្នុងកំឡុងពេល១០ឆ្នាំកន្លងមកដែរឬទេ?	1 □ បាទ/ចាស 0 □ ទេ (បន្តទៅផ្នែក V)		
2. តើអ្វីទៅជាការផ្លាស់ប្តូរដែលអ្នកបានធ្វើការកត់សម្គាល់ក្នុងរយៈពេល១០ឆ្នាំមកនេះ....? (ការឆ្លើយតបជាច្រើនអាចធ្វើទៅមុនបាន។ ពីការឆ្លើយតបដែលបានជ្រើសរើស តើមួយណាជាការផ្លាស់ប្តូរដ៏សំខាន់បំផុតសម្រាប់គ្រប់ប្រភេទ/ជួរ? សូមគូសរង្វង់មូល)			
a) .... នៅសីតុណ្ហភាព 1 □ កើនឡើង 2 □ ថយចុះ 3 □ ត្រជាក់ខ្លាំងក្នុងខែត្រជាក់ 4 □ កាន់តែក្តៅក្នុងខែក្តៅ 5 □ គ្មាន 6 □ ការផ្លាស់ប្តូរមិនទៀងទាត់ 99 □ ផ្សេងទៀត៖	b) .... នៅរដូវទឹកភ្លៀង 1 □ ទឹកភ្លៀងដំបូង 2 □ ភ្លៀងយឺត 3 □ ទឹកភ្លៀងទាប 4 □ ភ្លៀងធ្លាក់ខ្លាំង 5 □ គ្មាន 6 □ ការផ្លាស់ប្តូរមិនទៀងទាត់ 99 □ ផ្សេងទៀត៖	c) .... នៅគ្រោះរាំងស្ងួត 1 □ គ្រោះរាំងស្ងួតដំបូង 2 □ គ្រោះរាំងស្ងួតយឺត 3 □ គ្រោះរាំងស្ងួតទាប 4 □ គ្រោះរាំងស្ងួតខ្ពស់ 5 □ គ្មាន 6 □ ការផ្លាស់ប្តូរមិនទៀងទាត់ 99 □ ផ្សេងទៀត៖	d) .... នៅក្នុងទឹកជំនន់ 1 □ ទឹកជំនន់ញឹកញាប់ 2 □ ទឹកជំនន់ញឹកញាប់តិច 3 □ ឧប្បត្តិហេតុទឹកជំនន់ដែលមិននឹកស្មានដល់ 4 □ គ្មាន 6 □ ការផ្លាស់ប្តូរមិនទៀងទាត់ 99 □ ផ្សេងទៀត៖
3. តើអ្នក**គិតថា**ការប្រែប្រួលអាកាសធាតុ**នោះបណ្តាលមកពីអ្វី**? (*ចំលើយច្រើន*)	1 □ សកម្មភាពរបស់មនុស្ស 2 □ សកម្មភាពមិនមែនមនុស្ស 3 □គ្មាន 99 □ផ្សេងទៀត៖		

XIV. **ភាពតានតឹងនឹងអាកាសធាតុ និងការផ្លាស់ប្តូរលទ្ធផល**

1. តើភាពតានតឹងខាងក្រោមមួយណាដែលមានវត្តមាននៅក្នុងតំបន់របស់អ្នក? (*ចំលើយច្រើន*)	1 □ទឹកជំនន់ 2 □ព្យុះ 3 □ ជាតិប្រៃ 4 □ គ្រោះរាំងស្ងួត	5 □ កំដៅ 6 □ ការកើនឡើងកម្រិតទឹកសមុទ្រ 7 □ គ្មាន (បន្តទៅផ្នែក IX) 99 □ ផ្សេងទៀត៖

ចំណាំ៖ សំណួរទាំងអស់ខាងក្រោមនេះ សំដៅលើចម្លើយរបស់ពួកគេនៅក្នុងសំណួរមុន ភាពតានតឹងដែលភាគច្រើនបានប៉ះពាល់ដល់តំបន់ ឬញឹកញាប់បំផុតនៅក្នុងតំបន់។

2. តើភាពធ្ងន់ធ្ងរនៃភាពតានតឹង**នៃការប្រែប្រួលអាកាសធាតុ**នេះប្រែប្រួលទៅតាមពេលវេលាដែរឬទេ?	1 □ បាទ/ចាស 0 □ ទេ (បន្តទៅលេខ 5)			
3. តើភាពធ្ងន់ធ្ងរនៃភាពតានតឹង**នៃការប្រែប្រួលអាកាសធាតុ**នេះបានផ្លាស់ប្តូរយ៉ាងដូចម្តេច?	1 □ ថយចុះ (បន្តទៅលេខ 5) 2 □ កាន់តែអាក្រក់			
4. តើភាពធ្ងន់ធ្ងរនៃភាពតានតឹងនេះចាប់ផ្តើមកាន់តែអាក្រក់នៅពេលណា?	1 □1 ឆ្នាំមុន 2 □2 ឆ្នាំមុន	3 □3 ឆ្នាំមុន 4 □4 ឆ្នាំមុន	5 □5 ឆ្នាំមុន	

			6 □ជាង 5 ឆ្នាំមុន

5. ដំណាំស្រូវ (ផលិតដោយខ្លួនឯង)		
ក្នុងអំឡុងពេលនៃភាពតានតឹងនេះ តើអ្វីជាការផ្លាស់ប្តូរនៅក្នុង៖		ភាគរយនៃការផ្លាស់ប្តូរ
a) ដីស្រែដែលអ្នកដាំ?	1 □ កើនឡើង 2 □ ថយចុះ 0 □ គ្មានការផ្លាស់ប្តូរ	
b) ផ្ទៃដីស្រូវដែលអ្នកប្រមូលផល?	1 □ កើនឡើង 2 □ ថយចុះ 0 □ គ្មានការផ្លាស់ប្តូរ	
c) ទិន្នផលស្រូវដែលអ្នកទទួលបាន?	1 □ កើនឡើង 2 □ ថយចុះ 0 □ គ្មានការផ្លាស់ប្តូរ	

6. **សត្វ**ពាហនៈ	
a) តើភាពតានតឹងនេះប៉ះពាល់ដល់ផលិតកម្មសត្វរបស់អ្នកដែរឬទេ?	1 □ បាទ/ចាស 0 □ ទេ (បន្តទៅលេខ 7) 88 □ មិនអាចអនុវត្តបានទេ (បន្តទៅលេខ 7)
b) តើភាពតានតឹងនេះប៉ះពាល់ដល់សាច់**សត្វ**ដែលមានសម្រាប់ទទួលទាននៅផ្ទះយ៉ាងដូចម្តេច?	1 □ កើនឡើង 0 □ គ្មានការផ្លាស់ប្តូរ 2 □ ថយចុះ 88 □ Not applicable
c) តើភាពតានតឹងនេះប៉ះពាល់ដល់សាច់ដែលមានសម្រាប់លក់យ៉ាងដូចម្តេច?	1 □ កើនឡើង 0 □ គ្មានការផ្លាស់ប្តូរ 2 □ ថយចុះ 88 □ Not applicable
d) តើភាពតានតឹងនេះប៉ះពាល់ដល់ទឹកដោះគោដែលមានសម្រាប់ទទួលទាននៅផ្ទះយ៉ាងដូចម្តេច?	1 □ កើនឡើង 0 □ គ្មានការផ្លាស់ប្តូរ 2 □ ថយចុះ 88 □ Not applicable
e) តើភាពតានតឹងនេះប៉ះពាល់ដល់ទឹកដោះគោដែលមានសម្រាប់លក់យ៉ាងដូចម្តេច?	1 □ កើនឡើង 0 □ គ្មានការផ្លាស់ប្តូរ 2 □ ថយចុះ 88 □ Not applicable
f) តើភាពតានតឹងនេះប៉ះពាល់ដល់ស្មៅ ឬចំបើង (ចំណី) ជាចំណីសម្រាប់សត្វយ៉ាងដូចម្តេច?	1 □ កើនឡើង 0 □ គ្មានការផ្លាស់ប្តូរ 2 □ ថយចុះ 88 □ Not applicable
g) តើភាពតានតឹងនេះប៉ះពាល់ដល់ការកើតឡើងនៃជំងឺសត្វយ៉ាងដូចម្តេច?	1 □ កើនឡើង 0 □ គ្មានការផ្លាស់ប្តូរ 2 □ ថយចុះ 88 □ Not applicable
h) តើភាពតានតឹងនេះប៉ះពាល់ដល់ការស្លាប់របស់សត្វចិញ្ចឹមយ៉ាងដូចម្តេច?	1 □ កើនឡើង 0 □ គ្មានការផ្លាស់ប្តូរ 2 □ ថយចុះ 88 □ Not applicable

7. ត្រី (**ផលិតផលផ្ទាល់ខ្លួន**)	
a) តើភាពតានតឹងនេះប៉ះពាល់ដល់ផលិតកម្មវារីវប្បកម្មរបស់អ្នកដែរឬទេ?	1 □ បាទ/ចាស 0 □ ទេ (បន្តទៅលេខ 8) 88 □ Not applicable (បន្តទៅលេខ 8)
b) តើភាពតានតឹងនេះប៉ះពាល់ដល់ផលិតផលត្រីយ៉ាងដូចម្តេច?	1 □ កើនឡើង 0 □ គ្មានការផ្លាស់ប្តូរ 2 □ ថយចុះ 88 □ Not applicable
c) តើភាពតានតឹងនេះប៉ះពាល់ដល់ការផលិតផលបង្គា/**កំពឹស**យ៉ាងដូចម្តេច?	1 □ កើនឡើង 0 □ គ្មានការផ្លាស់ប្តូរ 2 □ ថយចុះ 88 □ Not applicable
d) តើភាពតានតឹងនេះប៉ះពាល់ដល់គុណភាពនៃការចាប់ត្រីយ៉ាងដូចម្តេច?	1 □ កើនឡើង 0 □ គ្មានការផ្លាស់ប្តូរ 2 □ ថយចុះ 88 □ Not applicable

e) តើភាពតានតឹងនេះប៉ះពាល់ដល់គុណភាពនៃការចាប់បង្គា/**កំពឹស**យ៉ាងដូចម្តេច?	1 □ កើនឡើង 0 □ គ្មានការផ្លាស់ប្តូរ 2 □ ថយចុះ 88 □ Not applicable
8. ការស្រោចស្រព	
a) តើភាពតានតឹងនេះប៉ះពាល់ដល់ប្រព័ន្ធធារាសាស្ត្រក្នុងកសិដ្ឋានរបស់អ្នកដែរឬទេ?	1 □ បាទ/ចាស 0 □ ទេ (បន្តទៅលេខ 9) 88 □ Not applicable (បន្តទៅលេខ 9)
b) តើភាពតានតឹងនេះប៉ះពាល់ដល់ប្រព័ន្ធធារាសាស្ត្រក្នុងកសិដ្ឋានរបស់អ្នកយ៉ាងដូចម្តេច?	
c) តើអ្វីជាប្រភពសំខាន់នៃទឹកស្រោចស្រពនៅក្នុងកសិដ្ឋានរបស់អ្នក?	1 □ ប្រឡាយ 3 □ ទំនប់ទឹក 2 □ អណ្តូងសាធារណៈ 4 □ ទ្វារទឹក 5 □ ទឹកស្រះ 6 □ ទឹកបឹង 99 □ ផ្សេងទៀត (សូមបញ្ជាក់.....)
d) តើអ្នកផ្លាស់ប្តូរប្រភពទឹកស្រោចស្រពរបស់អ្នកក្នុងអំឡុងពេលតានតឹងនេះឬទេ?	1 □ បាទ/ចាស 0 □ ទេ (បន្តទៅលេខ 9)
e) តើអ្វីទៅជាប្រភពថ្មីនៃទឹកស្រោចស្រពរបស់អ្នក?	1 □ ប្រឡាយ 3 □ ទំនប់ទឹក 2 □ អណ្តូងសាធារណៈ 4 □ ទ្វារទឹក 5 □ ទឹកស្រះ 6 □ ទឹកបឹង 99 □ ផ្សេងទៀត (សូមបញ្ជាក់.....)
9. អាហារ	
a) តើអ្នកទុកស្រូវដែលផលិតដោយខ្លួនឯងសម្រាប់ប្រើប្រាស់ក្នុងផ្ទះដែរឬទេ?	1 □ បាទ/ចាស 0 □ ទេ (បន្តទៅចំណុច e)
b) ក្នុងមួយឆ្នាំដែលមិនមានភាពតានតឹងខ្លាំង តើអង្ករប៉ុន្មានខែ និងប៉ុន្មានគោន ដែលអាចប្រើបានតាមផ្ទះ (ដោយមិនបានសន្សំទុកសម្រាប់ករណីបន្ទាន់ ឬគ្រោះមហន្តរាយ) ដែលបានមកពីផលិតផលផ្ទាល់ខ្លួនរបស់អ្នក?	ខែ៖ ..... គោន៖ .....
c) ក្នុងរយៈពេលមួយឆ្នាំដែលមានភាពតានតឹងខ្លាំង តើអង្ករប៉ុន្មានខែ និងប៉ុន្មានគោន ដែលអាចប្រើបានតាមផ្ទះ (ដោយមិនបានសន្សំទុកសម្រាប់ករណីបន្ទាន់ ឬគ្រោះមហន្តរាយ) ដែលបានមកពីផលិតផលផ្ទាល់ខ្លួនរបស់អ្នក?	ខែ៖ ..... គោន៖ .....
d) តើបរិមាណអង្ករដែលផលិតបាន អាចបរិភោគគ្រប់គ្រាន់នៅពេលមានភាពតានតឹងនេះដែរឬទេ?	1 □ បាទ/ចាស 0 □ ទេ
e) តើអ្នកមានលទ្ធភាពទិញអង្ករក្នុងអំឡុងពេលមានភាពតានតឹងនេះដែរឬទេ?	1 □ បាទ/ចាស 2 □ យើងមិនទិញអង្ករទេ (បន្តទៅលេខ 10) 0 □ ទេ
f) តើបរិមាណអង្ករដែលអ្នកទិញក្នុងអំឡុងពេលមានភាពតានតឹងនេះមានស្ថានភាពយ៉ាងដូចម្តេច?	1 □ កើនឡើង 2 □ ថយចុះ 0 □ គ្មានការផ្លាស់ប្តូរទេ
g) តើអ្វីជាការផ្លាស់ប្តូរនៃការមានអង្ករនៅលើទីផ្សារអំឡុងពេលមានភាពតានតឹងនេះ?	1 □ កើនឡើង 2 □ ថយចុះ 0 □ គ្មានការផ្លាស់ប្តូរទេ

h) តើអ្វីជាការផ្លាស់ប្តូរគុណភាពអង្ករដែលអ្នកបានទិញក្នុងអំឡុងពេលមានភាពតានតឹងនេះ?	1 □ ប្រសើរឡើង 2 □ ថយចុះ 0 □ គ្មានការផ្លាស់ប្តូរ		
10. ទឹកសំរាប់ផឹក			
a) តើអ្វីជាប្រភពទឹកផឹករបស់អ្នក?	01 ទឹកទុយរចូលផ្ទះ 02 ទឹកទុយរចូលក្នុងទីធ្លា ឬដីក្បែរផ្ទះ 03 = ទឹកទុយរសោធារណៈ 04 = ទឹកអណ្តូង 05 = ទឹកផ្ទៃដី (ទន្លេ, ព្រែក, ស្ទឹង, អាង, បឹង, ព្រែកស្រែ, ប្រឡាយ ទឹកស្រះ) 06 = ទឹកភ្លៀង 07 = រថយន្តដឹកទឹក 08 = ទឹកដប 09 = ផ្សេងៗ (សូមបញ្ជាក់)		
b) តើអ្នកទិញទឹកផឹកសម្រាប់ថ្ងៃធម្មតាទេ?	1 □ បាទ/ចាស 0 □ ទេ		
c) តើប្រភពនៃទឹកផឹករបស់អ្នកបានផ្លាស់ប្តូរក្នុងអំឡុងពេលមានភាពតានតឹងនេះឬទេ?	1 □ បាទ/ចាស 0 □ ទេ (បន្តទៅលេខ 11)		
d) តើអ្វីជាប្រភពទឹកថ្មីរបស់អ្នកក្នុងអំឡុងពេលមានភាពតានតឹងនេះ?	01 ទឹកទុយរចូលផ្ទះ 02 ទឹកទុយរចូលក្នុងទីធ្លា ឬដីក្បែរផ្ទះ 03 = ទឹកទុយរសោធារណៈ 04 = ទឹកអណ្តូង 05 = ទឹកផ្ទៃដី (ទន្លេ, ព្រែក, ស្ទឹង, អាង, បឹង, ព្រែកស្រែ, ប្រឡាយ ទឹកស្រះ) 06 = ទឹកភ្លៀង 07 = រថយន្តដឹកទឹក 08 = ទឹកដប 09 = ផ្សេងៗ (សូមបញ្ជាក់)		
11. សុខភាពមនុស្ស			
a) តើសុខភាពរបស់អ្នកបានប៉ះពាល់ដែរឬទេ ក្នុងអំឡុងពេលមានភាពតានតឹងនេះ?	1 □ បាទ/ចាស 0 □ ទេ		
b) តើនៅក្នុងគ្រួសារមានបញ្ហាសុខភាពទូទៅអ្វីខ្លះ ក្នុងអំឡុងពេលមានភាពតានតឹងនេះ? (*ចំលើយច្រើន*)	គ្រុនផ្តាសាយ 1 □ ជំងឺគ្រុនផ្តាសាយ 2 □ គ្រុនរងា 3 □ ក្អក 4 □ កណ្តាស់ 5 □ ឈឺក្បាល 6 □ ឈឺបំពង់ក	បញ្ហាបេះដូង,សម្ពាធឈាម 7 □ ជំងឺលើសឈាម 8 □ សម្ពាធឈាមទាប 9 □ ជំងឺគាំងបេះដូង 10 □ ជំងឺទឹកនោមផ្អែម 11 □ ជំងឺសាច់ដុំបេះដូង	បញ្ហាឆ្អឹង 12 □ គ្រិច 13 □ បាក់ឆ្អឹង 14 □ ជំងឺរលាក់សន្លាក់ 15 □ ជំងឺពុកឆ្អឹង 16 □ ជំងឺឈឺសន្លាក់

	បញ្ហាពោះវៀន 17 □ ជំងឺគ្រុនពោះវៀន 18 □ ជំងឺរាគ 19 □ ឈឺក្រពះ 20 □ ជំងឺBilharzia	បញ្ហាសួត/ថ្លើម 21 □ ជំងឺរបេង 22 □ ជំងឺរលាកសួត 23 □ ជំងឺមហារីកសួត 24 □ ជំងឺរលាកថ្លើម 25 □ បញ្ហាថ្លើម	ជំងឺសើស្បែក 26 □ ប្រតិកម្មអាឡែស៊ី 27 □ ជំងឺរមាស់ 28 □ ជំងឺអុតខ្មៅ 29 □ ជំងឺរើម 30 □ មុន
	31 □ គ្មាន (បន្តទៅលេខ 12) 99 □ ផ្សេងទៀត (សូមបញ្ជាក់៖_____)		
c) តើក្នុងចំណោមគ្រួសារ អ្នកណាដែលរងផលប៉ះពាល់សុខភាពច្រើនជាងគេដោយសារភាពតានតឹងនេះ? *(ការឆ្លើយតបជាច្រើនអាចធ្វើទៅបាន។)*	1 □ ប្តី 2 □ ប្រពន្ធ 3 □ ទាំងប្តីប្រពន្ធ 4 □ កុមារ	5 □ មនុស្សចាស់ 6 □ ទាំងអស់ 99 □ ផ្សេងទៀត (បញ្ជាក់_____)	
d) តើការផ្លាស់ប្តូរពីភាពធ្ងន់ធ្ងរនៃការប្រែប្រួលអាកាសធាតុនេះ ធ្វើឱ្យស្ថានភាពសុខភាពរបស់សមាជិកគ្រួសារដែលរងផលប៉ះពាល់ប្រែប្រួលយ៉ាងដូចម្តេច?	1 □ ប្រសើរឡើង 2 □ ថយចុះ 0 □ គ្មានការផ្លាស់ប្តូរ		
12. ការចូលប្រើហិរញ្ញវត្ថុ			
a) តើអ្នក ឬសមាជិកគ្រួសារណាមួយបានខ្ចីប្រាក់ក្នុងករណីមានភាពតានតឹងនេះ?	1 □ បាទ/ចាស 0 □ ទេ (បន្តទៅលេខ 13)		
b) តើអ្វីជាប្រភពសំខាន់នៃប្រាក់កម្ចីរបស់អ្នក? *(ការឆ្លើយតបជាច្រើនអាចធ្វើទៅបាន។ ការឆ្លើយតបដែលបានផ្តល់ឱ្យតើមួយណាដែលជាប្រភពប្រាក់កម្ចី?សូមគូសរង្វង់)*			
1 □ ធនាគារពាណិជ្ជកម្ម 2 □ គ្រឹះស្ថានមីក្រូហិរញ្ញវត្ថុ (MFIs) 3 □ អ្នកផ្តល់ប្រាក់កម្ចីឯកជន	4 □ សាច់ញាតិ 5 □ មិត្តភក្តិ 6 □ គម្រោងឥណទានមិនផ្លូវការ (តុងទីន) 99 □ ផ្សេងទៀត (បញ្ជាក់_____)		
c) តើមានការផ្លាស់ប្តូរចំនួននៃបរិមាណប្រាក់កម្ចីដែលទទួលបានក្នុងអំឡុងពេលមានភាពតានតឹងនេះដែរឬទេ?	1 □ កើនឡើង 2 □ ថយចុះ 0 □ គ្មានការផ្លាស់ប្តូរទេ		
d) តើអ្នកណាជាអ្នកខ្ចីលុយច្រើនជាងគេក្នុងអំឡុងពេលមានភាពតានតឹងនេះ?	1 □ ប្តី 2 □ ប្រពន្ធ 3 □ ទាំងប្តីប្រពន្ធ 4 □ កុមារ	5 □ មនុស្សចាស់ 6 □ ទាំងអស់ 99 □ ផ្សេងទៀត	
e) តើអ្នកប្រើបានប្រើប្រភពខ្ចីប្រាក់ដែលអ្នកបានជ្រើសរើសខាងលើជាប្រភពប្រាក់កម្ចីដូចគ្នាក្នុងអំឡុងពេលភាពតានតឹង	1 □ បាទ/ចាស (បន្តទៅចំណុច g) 0 □ ទេ		
f) តើអ្វីជាប្រភពប្រាក់កម្ចីរបស់អ្នកក្នុងអំឡុងពេលមានភាពតានតឹងនេះ? *(ការឆ្លើយតបជាច្រើនអាចធ្វើទៅបាន។ សូមគូសជុំវិញ។)*			
1 □ ធនាគារជាតិ	7 □ សហភាពអតីតយុទ្ធជន	13 □ សាច់ញាតិ	

2 □ ធនាគារកសិកម្ម និងអភិវឌ្ឍន៍ជនបទ 3 □ ធនាគារពាណិជ្ជកម្មរបស់រដ្ឋផ្សេងទៀត 4 □ ធនាគារឯកជន 5 □ អាជ្ញាធរមូលដ្ឋាន 6 □ សហភាពកសិករ	8 □ សហភាពនារី 9 □ មូលនិធិឥណទានរបស់ប្រជាជន 10 □ ឥណទានមូលនិធិផ្សេងទៀត 11 □ ពាណិជ្ជករឯកជន 12 □ អ្នកផ្តល់ប្រាក់កម្ចីឯកជន	14 □ មិត្តភក្តិ 15 □ គម្រោងឥណទានមិនផ្លូវការ 99 □ ផ្សេងទៀត

g) ប្រាក់កម្ចីដែលទទួលបានក្នុងអំឡុងពេលមានភាពតានតឹងនេះ តើក្នុងគោលបំណងអ្វី?
(*ចំលើយច្រើន*)

គោលបំណងដែលបានបញ្ជាក់	គោលបំណងដែលពិតប្រាកដ
1 □ អង្ករ 2 □ ផលិតកម្មដំណាំផ្សេងទៀត (រួមទាំងធាតុចូល) 3 □ ការចិញ្ចឹមសត្វ 4 □ ព្រៃឈើ 5 □ នេសាទ 6 □ សកម្មភាពមិនមែនកសិកម្ម 7 □ សងប្រាក់កម្ចីផ្សេងទៀត 8 □ សាងសង់/ទិញផ្ទះ 9 □ ទិញដី 10 □ ទិញទ្រព្យសម្បត្តិផ្សេងទៀត 99 □ ផ្សេងទៀត (បញ្ជាក់_____)	1 □ អង្ករ 2 □ ផលិតកម្មដំណាំផ្សេងទៀត (រួមទាំងធាតុចូល) 3 □ ការចិញ្ចឹមសត្វ 4 □ ព្រៃឈើ 5 □ នេសាទ 6 □ សកម្មភាពមិនមែនកសិកម្ម 7 □ សងប្រាក់កម្ចីផ្សេងទៀត 8 □ សាងសង់/ទិញផ្ទះ 9 □ ទិញដី 10 □ ទិញទ្រព្យសម្បត្តិផ្សេងទៀត 11 □ បង់សម្រាប់អាពាហ៍ពិពាហ៍/បុណ្យ 12 □ ការចំណាយលើការអប់រំ 13 □ ការចំណាយលើសុខភាព 14 □ ការប្រើប្រាស់ទូទៅ 99 □ ផ្សេងទៀត (បញ្ជាក់_____)

13. សកម្មភាពការងារ

a) តើអ្នកផ្តល់កម្លាំងពលកម្មក្នុងសកម្មភាពកសិកម្ម និងមិនមែនកសិកម្មទេ?	1 □ បាទ/ចាស 0 □ ទេ (បន្តទៅផ្នែក VI)

b) សូមបង្ហាញពីការផ្លាស់ប្តូរពេលវេលារបស់អ្នកដែលបានចំណាយលើសកម្មភាពជាក់លាក់ ដែលបានរាយខាងក្រោមនេះ ក្នុងអំឡុងពេលមានភាពតានតឹងនេះ។

លេខកូដ៖ 1 □ កើនឡើង 2 □ ថយចុះ 0 □ គ្មានការផ្លាស់ប្តូរទេ 88 □ មិនអាចអនុវត្តបាន

b1) ផលិតកម្មស្រូវ					b2) ផលិតកម្មដំណាំផ្សេងៗ 88 □				
ការជ្រើសរើសពូជ	1 □	2 □	0 □	88 □	ការជ្រើសរើសពូជ	1 □	2 □	0 □	88 □
ការរៀបចំគ្រាប់ពូជ	1 □	2 □	0 □	88 □	ការរៀបចំគ្រាប់ពូជ	1 □	2 □	0 □	88 □
ការរៀបចំដី	1 □	2 □	0 □	88 □	ការរៀបចំដី	1 □	2 □	0 □	88 □
ការស្ទូង	1 □	2 □	0 □	88 □	ការស្ទូង	1 □	2 □	0 □	88 □
ការដាក់ជី	1 □	2 □	0 □	88 □	ការដាក់ជី	1 □	2 □	0 □	88 □

ការដេកស្មៅ	1 □	2 □	0 □	88 □	ការដេកស្មៅ	1 □	2 □	0 □	88 □
បោកស្បូវ	1 □	2 □	0 □	88 □	បោកស្បូវ	1 □	2 □	0 □	88 □
ការសម្ងួត	1 □	2 □	0 □	88 □	ការសម្ងួត	1 □	2 □	0 □	88 □
ការលុបបំបាត់ប្រភេទ	1 □	2 □	0 □	88 □	ការលុបបំបាត់ប្រភេទ	1 □	2 □	0 □	88 □
ការជ្រើសរើសពូជសម្រាប់រដូវដាំដុះបន្ទាប់	1 □	2 □	0 □	88 □	ការជ្រើសរើសពូជសម្រាប់រដូវដាំដុះបន្ទាប់	1 □	2 □	0 □	88 □
ការរក្សាទុកគ្រាប់ពូជ	1 □	2 □	0 □	88 □	ការរក្សាទុកគ្រាប់ពូជ	1 □	2 □	0 □	88 □
ការទិញធាតុចូល	1 □	2 □	0 □	88 □	ការទិញធាតុចូល	1 □	2 □	0 □	88 □
ការលក់ផលិតផល	1 □	2 □	0 □	88 □	ការលក់ផលិតផល	1 □	2 □	0 □	88 □
ការត្រួតពិនិត្យការងារជួល	1 □	2 □	0 □	88 □	ការត្រួតពិនិត្យការងារជួល	1 □	2 □	0 □	88 □
ការនាំយកអាហារទៅកសិដ្ឋាន	1 □	2 □	0 □	88 □	ការនាំយកអាហារទៅកសិដ្ឋាន	1 □	2 □	0 □	88 □
ការប្រើប្រាស់សារធាតុគីមី	1 □	2 □	0 □	88 □	ការប្រើប្រាស់សារធាតុគីមី	1 □	2 □	0 □	88 □
ការប្រមូលផល	1 □	2 □	0 □	88 □	ការប្រមូលផល	1 □	2 □	0 □	88 □
ផ្សេងៗ	1 □	2 □	0 □	88 □	ផ្សេងៗ	1 □	2 □	0 □	88 □
b3) ការគ្រប់គ្រងសត្វ 88 □					b4) វារីវប្បកម្ម 88 □				
ការសម្អាតទ្រុងសត្វ	1 □	2 □	0 □	88 □	ការចាប់ត្រី	1 □	2 □	0 □	88 □
ការប្រមូលចំណីបៃតង	1 □	2 □	0 □	88 □	ការចាប់បង្កា/កំពឹស	1 □	2 □	0 □	88 □
ការរៀបចំ (ចម្រាំ) ចំណីពណ៌បៃតង	1 □	2 □	0 □	88 □	ផ្សេងៗ	1 □	2 □	0 □	88 □
វ៉ាលស្មៅសម្រាប់សត្វធំៗ	1 □	2 □	0 □	88 □		1 □	2 □	0 □	88 □
ការថែរក្សាសត្វជ្រូក	1 □	2 □	0 □	88 □		1 □	2 □	0 □	88 □
ការថែរក្សាសត្វបក្សី	1 □	2 □	0 □	88 □	b6) សកម្មភាពគ្រួសារ 88 □				
លក់សត្វធំៗ	1 □	2 □	0 □	88 □	ការចិញ្ចឹមកូន	1 □	2 □	0 □	88 □
លក់សត្វតូចៗ	1 □	2 □	0 □	88 □	ការសម្អាតផ្ទះ	1 □	2 □	0 □	88 □
លក់សត្វមាន់	1 □	2 □	0 □	88 □	ការបោកគក់សម្លៀកបំពាក់	1 □	2 □	0 □	88 □
ផ្សេងៗ	1 □	2 □	0 □	88 □	ការចម្អិនអាហារ	1 □	2 □	0 □	88 □
b5) ការងារក្រៅពីកសិដ្ឋាន 88 □					ផ្សេងៗ	1 □	2 □	0 □	88 □
រដ្ឋាភិបាល	1 □	2 □	0 □	88 □					
សហគ្រាសសាធារណៈ	1 □	2 □	0 □	88 □					
កម្មវិធីការងារសាធារណៈ	1 □	2 □	0 □	88 □					
បុគ្គល/គ្រួសារឯកជន	1 □	2 □	0 □	88 □					

ក្រុមហ៊ុនឯកជនកម្ពុជា	1 □	2 □	0 □	88 □					
ក្រុមហ៊ុនឯកជនបរទេស	1 □	2 □	0 □	88 □					
ផ្សេងៗ	1 □	2 □	0 □	88 □					

XV. ភាពតានតឹងផ្នែកអាកាសធាតុ និងផលប៉ះពាល់

4. តើអ្វីខ្លះជាផលប៉ះពាល់ធ្ងន់ធ្ងរនៃភាពតានតឹងផ្នែកអាកាសអាតុនេះ ចំពោះផលិតកម្មស្រូវរបស់អ្នក?	1□ទិន្នផលទាប 4□បង្កើនបំណុល 2□ការខូចខាតដំណាំ 5□គ្មាន 3□អសន្តិសុខស្បៀងអាហារ 99□ផ្សេងទៀត (បញ្ជាក់_____)

5. តើផលប៉ះពាល់ (ក្នុងបញ្ជីខាងក្រោម) ដោយសារភាពតានតឹងនេះ ប៉ះពាល់ជាអវិជ្ជមានដល់ជីវិតរស់នៅរបស់បុរសដែរឬទេ? ក្នុងបញ្ជីនេះ តើមួយណាជាផលប៉ះពាល់អវិជ្ជមានដល់ជីវិតរស់នៅរបស់បុរសខ្លាំងបំផុត? *(សូមគូស។)*

ផលប៉ះពាល់	រងផលប៉ះពាល់		មិនប៉ះពាល់
	ខ្ពស់	បន្តិច	
1□ការកើនឡើងបញ្ហាសុខភាព			
2□ភាពមិនចុះសម្រុងគ្នាកាន់តែខ្លាំងឡើង ក្នុងចំណោមសមាជិក គ្រួសារ			
3□ការកើនឡើងភាពតានតឹងក្នុងការផ្តល់អាហារដល់សមាជិកគ្រួសារ			
4□ភាពតានតឹងក្នុងការជួលកម្លាំងពលកម្ម			
5□ភាពតានតឹងក្នុងការជួលគ្រឿងម៉ាស៊ីន			
6□ភាពតានតឹងក្នុងការទទួលបានប្រាក់កម្ចី			
7□កាន់តែតានតឹង / ចប់បារម្ភកាន់តែច្រើន			
99□ ផ្សេងៗ (បញ្ជាក់)៖			

6. តើផលប៉ះពាល់ (ក្នុងបញ្ជីខាងក្រោម) ដោយសារភាពតានតឹងនេះ ប៉ះពាល់ជាអវិជ្ជមានដល់ជីវិតរស់នៅរបស់ស្ត្រីដែរឬទេ? ក្នុងបញ្ជីនេះ តើមួយណាជាផលប៉ះពាល់អវិជ្ជមានដល់ជីវិតរស់នៅរបស់ស្ត្រីខ្លាំងបំផុត? *(សូមគូស។)*

ផលប៉ះពាល់	រងផលប៉ះពាល់		មិនប៉ះពាល់
	ខ្ពស់	បន្តិច	
1□ការកើនឡើងបញ្ហាសុខភាព			
2□ភាពមិនចុះសម្រុងគ្នាកាន់តែខ្លាំងឡើង ក្នុងចំណោមសមាជិក គ្រួសារ			
3□ការកើនឡើងភាពតានតឹងក្នុងការផ្តល់អាហារដល់សមាជិកគ្រួសារ			
4□ភាពតានតឹងក្នុងការជួលកម្លាំងពលកម្ម			
5□ភាពតានតឹងក្នុងការជួលគ្រឿងម៉ាស៊ីន			
6□ភាពតានតឹងក្នុងការទទួលបានប្រាក់កម្ចី			
7□កាន់តែតានតឹង / ចប់បារម្ភកាន់តែច្រើន			
99□ ផ្សេងៗ (បញ្ជាក់)៖			

XVI. ការគាំទ្រពីស្ថាប័ន

10. តើអ្នកទទួលបានការគាំទ្រណាមួយក្នុងអំឡុងពេលភាពតានតឹងនេះទេ?	1 □បាទ/ចាស 0 □ទេ (បន្តទៅ **3**)

11.**ក)** តើអ្នកទទួលបានការ គាំទ្របែបណា?		**ខ)** តើអ្វីជាប្រភពនៃការគាំទ្រនេះ?	
1 □លំនៅដ្ឋាន	**ក) រដ្ឋាភិបាល** 1 □រដ្ឋាភិបាលកណ្តាល 2 □រដ្ឋាភិបាលមូលដ្ឋាន 3 □ធនាគាររដ្ឋ 4 □ធនាគារពាណិជ្ជ 99 □ផ្សេងទៀត៖	**ខ) ស្ថាប័ន** 5 □អង្គការអន្តរជាតិ 6 □អង្គការក្រៅរដ្ឋាភិបាល 7 □អង្គការឯកជន 99 □ផ្សេងទៀត៖	**គ) សហជីពកសិករ** 8 □សង្គមស៊ីវិល 9 □សមាគមកសិករ 10 □សហករណ៍ 11 □ក្រុមការប្រាក់ 99 □ផ្សេងទៀត៖
2 □អាហារសម្រន់	**ក) រដ្ឋាភិបាល** 1 □រដ្ឋាភិបាលកណ្តាល 2 □រដ្ឋាភិបាលមូលដ្ឋាន 3 □ធនាគាររដ្ឋ 4 □ធនាគារពាណិជ្ជ 99 □ផ្សេងទៀត៖	**ខ) ស្ថាប័ន** 5 □អង្គការអន្តរជាតិ 6 □អង្គការក្រៅរដ្ឋាភិបាល 7 □អង្គការឯកជន 99 □ផ្សេងទៀត៖	**គ) សហជីពកសិករ** 8 □សង្គមស៊ីវិល 9 □សមាគមកសិករ 10 □សហករណ៍ 11 □ក្រុមការប្រាក់ 99 □ផ្សេងទៀត៖
3 □ឥណទាន	**ក) រដ្ឋាភិបាល** 1 □រដ្ឋាភិបាលកណ្តាល 2 □រដ្ឋាភិបាលមូលដ្ឋាន 3 □ធនាគាររដ្ឋ 4 □ធនាគារពាណិជ្ជ 99 □ផ្សេងទៀត៖	**ខ) ស្ថាប័ន** 5 □អង្គការអន្តរជាតិ 6 □អង្គការក្រៅរដ្ឋាភិបាល 7 □អង្គការឯកជន 99 □ផ្សេងទៀត៖	**គ) សហជីពកសិករ** 8 □សង្គមស៊ីវិល 9 □សមាគមកសិករ 10 □សហករណ៍ 11 □ក្រុមការប្រាក់ 99 □ផ្សេងទៀត៖
4 □ការធានារ៉ាប់រងសុខភាព	**ក) រដ្ឋាភិបាល** 1 □រដ្ឋាភិបាលកណ្តាល 2 □រដ្ឋាភិបាលមូលដ្ឋាន 3 □ធនាគាររដ្ឋ 4 □ធនាគារពាណិជ្ជ 99 □ផ្សេងទៀត៖	**ខ) ស្ថាប័ន** 5 □អង្គការអន្តរជាតិ 6 □អង្គការក្រៅរដ្ឋាភិបាល 7 □អង្គការឯកជន 99 □ផ្សេងទៀត៖	**គ) សហជីពកសិករ** 8 □សង្គមស៊ីវិល 9 □សមាគមកសិករ 10 □សហករណ៍ 11 □ក្រុមការប្រាក់ 99 □ផ្សេងទៀត៖
5 □វគ្គបណ្តុះបណ្តាលស្តីពីបច្ចេកវិទ្យាស្រូវថ្មី	**ក) រដ្ឋាភិបាល** 1 □រដ្ឋាភិបាលកណ្តាល 2 □រដ្ឋាភិបាលមូលដ្ឋាន 3 □ធនាគាររដ្ឋ	**ខ) ស្ថាប័ន** 5 □អង្គការអន្តរជាតិ 6 □អង្គការក្រៅរដ្ឋាភិបាល 7 □អង្គការឯកជន	**គ) សហជីពកសិករ** 8 □សង្គមស៊ីវិល 9 □សមាគមកសិករ 10 □សហករណ៍

	4 □ធនាគារពាណិជ្ជ 99 □ផ្សេងទៀត៖	99 □ផ្សេងទៀត៖	11 □ក្រុមការប្រាក់ 99 □ផ្សេងទៀត៖
6 □គាំទ្រសកម្មភាពកសិកម្ម	**ក) រដ្ឋាភិបាល** 1 □រដ្ឋាភិបាលកណ្តាល 2 □រដ្ឋាភិបាលមូលដ្ឋាន 3 □ធនាគាររដ្ឋ 4 □ធនាគារពាណិជ្ជ 99 □ផ្សេងទៀត៖	**ខ) ស្ថាប័ន** 5 □អង្គការអន្តរជាតិ 6 □អង្គការក្រៅរដ្ឋាភិបាល 7 □អង្គការឯកជន 99 □ផ្សេងទៀត៖	**គ) សហជីពកសិករ** 8 □សង្គមស៊ីវិល 9 □សមាគមកសិករ 10 □សហករណ៍ 11 □ក្រុមការប្រាក់ 99 □ផ្សេងទៀត៖
99 □ផ្សេងទៀត៖	**ក) រដ្ឋាភិបាល** 1 □រដ្ឋាភិបាលកណ្តាល 2 □រដ្ឋាភិបាលមូលដ្ឋាន 3 □ធនាគាររដ្ឋ 4 □ធនាគារពាណិជ្ជ 99 □ផ្សេងទៀត៖	**ខ) ស្ថាប័ន** 5 □អង្គការអន្តរជាតិ 6 □អង្គការក្រៅរដ្ឋាភិបាល 7 □អង្គការឯកជន 99 □ផ្សេងទៀត៖	**គ) សហជីពកសិករ** 8 □សង្គមស៊ីវិល 9 □សមាគមកសិករ 10 □សហករណ៍ 11 □ក្រុមការប្រាក់ 99 □ផ្សេងទៀត៖

12. តើអ្នករំពឹងលើការគាំទ្របែបណាពីរដ្ឋាភិបាលក្នុងពេលមានភាពតានតឹងនេះ? *(រៀបរាប់ការរំពឹង ចំនួន 3 សំខាន់បំផុត តាមលំដាប់ចុះ)*	1, 2, 3,
13. តើអ្នកមានទទួលបានព័ត៌មានអំពី **លំនាំនៃការដាំដុះ /ការអនុវត្តកសិកម្ម** ឬទេ?	1 □បាទ/ចាស 0 □ទេ (បន្តទៅ **6**)

14. តើអ្នកទទួលបានព័ត៌មានអំពីលំនាំនៃការដាំដុះ / ការអនុវត្តកសិកម្ម មានប្រភពមកពីណា? *(ការឆ្លើយតបជាច្រើនអាចធ្វើទៅបាន)*	1 □អង្គការរដ្ឋាភិបាល 2 □អង្គការក្រៅរដ្ឋាភិបាល (ឈ្មោះ៖ _____) 3 □អង្គការឯកជន 4 □សាកលវិទ្យាល័យ 5 □ស្ថាប័នស្រាវជ្រាវ	6 □វិទ្យុ 7 □កាសែត 8 □ទូរទស្សន៍ 9 □ចំណេះដឹងប្រពៃណី	10 □អ្នកជិតខាង 11 □កសិកររផ្សេងទៀត។ 12 □សមាជិកគ្រួសារ 99 □ផ្សេងទៀត៖
15. តើអ្នកមានទទួលបានព័ត៌មានអំពី **សកម្មភាពវារីប្បកម្ម** ឬទេ?	1 □បាទ/ចាស 0 □ទេ (បន្តទៅ **លេខ 8**)		
16. តើអ្នកទទួលបានព័ត៌មានអំពីសកម្មភាពវារីប្បកម្ម មានប្រភពមកពីណា? *(ការឆ្លើយតបជាច្រើនអាចធ្វើទៅបាន)*	1 □អង្គការរដ្ឋាភិបាល 2 □អង្គការក្រៅរដ្ឋាភិបាល (ឈ្មោះ៖ _____) 3 □អង្គការឯកជន	6 □វិទ្យុ 7 □កាសែត 8 □ទូរទស្សន៍ 9 □ចំណេះដឹងប្រពៃណី	10 □អ្នកជិតខាង 11 □កសិកររផ្សេងទៀត។ 12 □សមាជិកគ្រួសារ 99 □ផ្សេងទៀត៖

	4 □សាកលវិទ្យាល័យ 5 □ស្ថាប័នស្រាវជ្រាវ
17. តើអ្នកមានទទួលបានព័ត៌មានអំពី **លក្ខខណ្ឌអាកាសធាតុ** ឬទេ?	1 □បាទ/ចាស 0 □ទេ (បន្តទៅ **VIII**)
18. តើអ្នកទទួលបានព័ត៌មានអំពីលក្ខខណ្ឌអាកាសធាតុ មានប្រភពមកពីណា? *(ការឆ្លើយតបជាច្រើនអាចឆ្លើទៅបាន)*	1 □អង្គការរដ្ឋាភិបាល 2 □អង្គការក្រៅរដ្ឋាភិបាល (ឈ្មោះ៖ _____) 3 □អង្គការឯកជន 4 □សាកលវិទ្យាល័យ 5 □ស្ថាប័នស្រាវជ្រាវ 6 □វិទ្យុ 7 □កាសែត 8 □ទូរទស្សន៍ 9 □ចំណេះដឹងប្រពៃណី 10 □អ្នកជិតខាង 11 □កសិករផ្សេងទៀត។ 12 □សមាជិកគ្រួសារ 99 □ផ្សេងទៀត៖ (បញ្ជាក់_____)

XVII. យុទ្ធសាស្ត្រសម្របខ្លួន និងទប់ទល់

6.តើអ្នកនឹងធ្វើយុទ្ធសាស្ត្រដោះស្រាយអ្វីខ្លះ ដើម្បីឆ្លើយតបទៅនឹងផលប៉ះពាល់អវិជ្ជមាននៃការប្រែប្រួលអាកាសធាតុ? *(ចំលើយច្រើន)*	1 □គ្មាន 2 □កាត់បន្ថយការប្រើប្រាស់ 3 □លក់ដី 4 □លក់សត្វពាហនៈ 5 □លក់ទ្រព្យសម្បត្តិផ្សេង 6 □ទទួលជំនួយពីសាច់ញាតិឬមិត្តភក្តិ	7 □ទទួលជំនួយពីរដ្ឋាភិបាល 8 □ទទួលជំនួយពីអង្គការក្រៅរដ្ឋាភិបាល 9 □ខ្ចីលុយពីធនាគារ 10 □ខ្ចីពីអ្នកដទៃ 11 □ទទួលការបង់ប្រាក់ធានារ៉ាប់រង	12 □ពន្យារពេលការទូទាត់ប្រាក់កម្ចី 13 □ធ្វើការបន្ថែមទៀត 14 □នាំកូនចេញពីសាលា/បញ្ជូនកូនទៅធ្វើការ 15 □ប្រើប្រាក់សន្សំ 99 □ផ្សេងទៀត៖ (បញ្ជាក់_____)
7.តើអ្នកបានធ្វើការផ្លាស់ប្តូរអ្វីខ្លះនៅក្នុងសកម្មភាពកសិកម្មរបស់អ្នក ក្នុងអំឡុងពេលភាពតានតឹង? *(ចំលើយច្រើន)*	1 □ផ្លាស់ប្តូរលំនាំដាំដុះ 2 □ការផ្លាស់ប្តូរពូជស្រូវ 3 □ផ្លាស់ប្តូរពីដំណាំទៅជាសត្វ 4 □ដាំដំណាំឱ្យបានច្រើនប្រភេទ 5 □ដាំដំណាំជាប្រភេទចំណីសត្វ 6 □ការផ្លាស់ប្តូរទីតាំងដំណាំ		7 □ទុកដីទំនេរ 8 □គ្មានការផ្លាស់ប្តូរ 99 □ផ្សេងទៀត៖ (បញ្ជាក់_____)

8. តើកត្តាសំខាន់ៗអ្វីខ្លះនៅក្នុងការសម្រេចចិត្តរបស់អ្នកក្នុងការផ្លាស់ប្តូរទម្លាប់	g) ...ពូជស្រូវ?	h) ... លំនាំដាំដុះ?	i) ...ប្រតិទិនដាំដុះ?
	1 □ទិន្នផលល្អ 2 □អត់ធ្មត់ចំពោះភាពតានតឹង 3 □អនុសាសន៍របស់រដ្ឋាភិបាល 4 □រាជធានី	1 □ទិន្នផលល្អ 2 □អត់ធ្មត់ចំពោះភាពតានតឹង 3 □អនុសាសន៍របស់រដ្ឋាភិបាល 4 □រាជធានី	1 □ទិន្នផលល្អ 2 □អត់ធ្មត់ចំពោះភាពតានតឹង 3 □អនុសាសន៍របស់រដ្ឋាភិបាល 4 □រាជធានី

ប្រើប្រាស់ជាទូទៅ...? *(ចំលើយច្រើន)*	5 □ភាពអាចរកបាននៃទឹក 6 □តម្រូវការទីផ្សារ 7 □ភាពអាចរកបាន និងការចូលទៅកាន់ធាតុបញ្ចូល 8 □តម្លៃប្រមូលផលកសិកម្ម 9 □កត្តារូបវិទ្យា (ដី និងអាកាសធាតុ) 99 □ផ្សេងទៀត៖ (បញ្ជាក់_______)	5 □ភាពអាចរកបាននៃទឹក 6 □តម្រូវការទីផ្សារ 7 □ភាពអាចរកបាន និងការចូលទៅកាន់ធាតុបញ្ចូល 8 □តម្លៃប្រមូលផលកសិកម្ម 9 □កត្តារូបវិទ្យា (ដី និងអាកាសធាតុ) 99 □ផ្សេងទៀត៖ (បញ្ជាក់_______)	5 □ភាពអាចរកបាននៃទឹក 6 □តម្រូវការទីផ្សារ 7 □ភាពអាចរកបាន និងការចូលទៅកាន់ធាតុបញ្ចូល 8 □តម្លៃប្រមូលផលកសិកម្ម 9 □កត្តារូបវិទ្យា (ដី និងអាកាសធាតុ) 99 □ផ្សេងទៀត៖ (បញ្ជាក់_______)

9. តើអ្នកនឹងចាត់ទុកបច្ចេកវិទ្យាខាងក្រោមនេះជាផ្នែកនៃយុទ្ធសាស្ត្ររបស់អ្នកដើម្បីទប់ទល់នឹងបញ្ហាប្រឈមនឹងការប្រែប្រួលអាកាសធាតុដែរឬទេ?

យុទ្ធសាស្ត្រ	បាទ	ទេ
ការប្រើប្រាស់ពូជដែលធន់នឹងភាពការប្រឈម		
ប្តូរទៅប្រព័ន្ធដាំដុះដែលប្រសើរឡើង		
ការផ្លាស់ប្តូរពូជស្រូវ ឬដំណាំ		
បច្ចេកទេសគ្រប់គ្រងដីថ្មី (ឧ. ការភ្ជួររាស់សម្រាប់ស្រូវ, បច្ចេកទេសអភិរក្សធនធាន)		
ការផ្លាស់ប្តូរការគ្រប់គ្រងទឹក (ជំនួសវិធីសាស្ត្រសំណើម និងសម្ងួត, ធុងក្រោមដី, ដើមឫស្សីសម្រាប់បង្ហូរទឹក)		
បច្ចេកទេសគ្រប់គ្រងសត្វល្អិត និងជំងឺ		
ការអភិវឌ្ឍន៍ និងប្រើប្រាស់ពូជដំណាំដែលធន់នឹងសត្វល្អិត និងជំងឺ		
ពូជសត្វថ្មី		
ការកែលម្អការគ្រប់គ្រងសុខភាពសត្វ		
ការផ្លាស់ប្តូរប្រតិទិនដំណាំ		
ការផ្លាស់ប្តូរកម្រិតនៃការបញ្ចូលដែលបានប្រើ (ដី គ្រាប់ពូជ ។ល។)		
ការផ្លាស់ទីកន្លែងដាំ		
ផ្សេងៗ (បញ្ជាក់)		
គ្មាន		

10. តើអ្នកត្រូវការវគ្គបណ្តុះបណ្តាលអ្វីខ្លះ ដើម្បីបង្កើនជំនាញ និងចំណេះដឹងរបស់អ្នក ដើម្បីឱ្យមានភាពច្បាស់លាស់លើយុទ្ធសាស្ត្រដែលបានរៀបរាប់ខាងលើឱ្យបានប្រសើរជាងមុន? *(ចំលើយច្រើន)*	1 □ការគ្រប់គ្រងសុខភាពគ្រាប់ពូជ 2 □ការគ្រប់គ្រងទឹក 3 □ការគ្រប់គ្រងផលិតកម្មដំណាំ 4 □ការគ្រប់គ្រងសារធាតុចិញ្ចឹម 5 □ការគ្រប់គ្រងសត្វល្អិត 6 □ក្រោយប្រមូលផល រួមទាំងការផ្ទុក 7 □ការគ្រប់គ្រងសត្វ 99 □ការបង្កើតប្រាក់ចំណូលផ្សេងទៀត៖

ប្រសិនបើផ្នែកមុនមានចម្លើយ សូមរំលងផ្នែកទី IX។ ផ្នែកទី IX ជាចម្បងសម្រាប់អ្នកឆ្លើយ សំណួរដែលមិនបានឆ្លើយ នៅក្នុងផ្នែកទី V សំណួរទី 1 ។

XVIII. យុទ្ធសាស្ត្រសម្របខ្លួន និងទប់ទល់ (*សម្រាប់តែអ្នកឆ្លើយតបដែលសង្កេតមើលមិនមានភាពតានតឹងផ្នែកអាកាសធាតុនៅក្នុងតំបន់*)

6.តើយុទ្ធសាស្ត្រទប់ទល់អ្វីខ្លះ ដែលអ្នកនឹងធ្វើ ដើម្បីឆ្លើយតបនឹងផលប៉ះ ពាល់អវិជ្ជមានក្នុងករណីមានភាពតានតឹង ? *(ចំលើយច្រើន)*	1 □គ្មាន 2 □កាត់បន្ថយការប្រើប្រាស់ 3 □លក់ដី 4 □លក់សត្វពាហនៈ 5 □លក់ទ្រព្យសម្បត្តិផ្សេងទៀត 6 □ទទួល ជំនួយពីសាច់ញាតិឬមិត្តភក្តិ	7 □ទទួលជំនួយពីរដ្ឋាភិបាល 8 □ទទួលជំនួយពីអង្គការក្រៅរដ្ឋាភិបាល 9 □ខ្ចីលុយពីធនាគារ 10 □ខ្ចីពីអ្នកដទៃ 11 □ ទទួលការបង់ប្រាក់ធានារ៉ាប់រង	12 □ពន្យារពេលការទូទាត់ប្រាក់កម្ចី 13 □ធ្វើការបន្ថែមទៀត 14 □នាំកូនចេញពីសាលា / បញ្ជូនកូនទៅធ្វើការ 15 □ប្រើប្រាក់សន្សំ 99 □ផ្សេងទៀត៖

7. តើអ្នកនឹងធ្វើការផ្លាស់ប្តូរអ្វីខ្លះក្នុងសកម្មភាពកសិកម្មរបស់អ្នក ក្នុងករណីមានភាពតានតឹង ? *(ចំលើយច្រើន)*	1 □ផ្លាស់ប្តូរលំនាំដាំដុះ 99 □ផ្សេងទៀត៖ 2 □ផ្លាស់ប្តូរពូជស្រូវ 3 □ផ្លាស់ប្តូរពីដំណាំទៅជាសត្វ 4 □ដាំដំណាំឱ្យបានច្រើនប្រភេទ 5 □ដាំដំណាំប្រភេទចំណីសត្វ 6 □ផ្លាស់ប្តូរទីតាំងដំណាំ 7 □ទុកជាដីទំនេរ 8 □គ្មានការផ្លាស់ប្តូរ

8. តើកត្តាសំខាន់អ្វីខ្លះនៅក្នុងការសម្រេចចិត្តរបស់អ្នកក្នុងការផ្លាស់ប្តូរទម្លាប់ ជាទូទៅ... ? *(ចំលើយច្រើន)*	j) ...ពូជស្រូវ ?	k) ... លំនាំដាំដុះ ?	l) ... ប្រតិទិនដាំដុះ ?
	1 □ទិន្នផលល្អ 2 □អត់ធ្មត់ចំពោះភាពតានតឹង 3 □អនុសាសន៍របស់រដ្ឋាភិបាល 4 □ដើមទុន 5 □ភាពអាចរកបាននៃទឹក 6 □តម្រូវការទីផ្សារ 7 □ភាពអាចរកបាន និងការចូលទៅកាន់ធាតុបញ្ចូល 8 □តម្លៃប្រមូលផលកសិកម្ម 9 □កត្តាដី និងអាកាសធាតុ 99 □ផ្សេងទៀត៖	1 □ទិន្នផលល្អ 2 □អត់ធ្មត់ចំពោះភាពតានតឹង 3 □អនុសាសន៍របស់រដ្ឋាភិបាល 4 □ដើមទុន 5 □ភាពអាចរកបាននៃទឹក 6 □តម្រូវការទីផ្សារ 7 □ភាពអាចរកបាន និងការចូលទៅកាន់ធាតុបញ្ចូល 8 □តម្លៃប្រមូលផលកសិកម្ម 9 □កត្តាដី និងអាកាសធាតុ 99 □ផ្សេងទៀត៖	1 □ទិន្នផលល្អ 2 □អត់ធ្មត់ចំពោះភាពតានតឹង 3 □អនុសាសន៍របស់រដ្ឋាភិបាល 4 □ដើមទុន 5 □ភាពអាចរកបាននៃទឹក 6 □តម្រូវការទីផ្សារ 7 □ភាពអាចរកបាន និងការចូលទៅកាន់ធាតុបញ្ចូល 8 □តម្លៃប្រមូលផលកសិកម្ម 9 □កត្តាដី និងអាកាសធាតុ 99 □ផ្សេងទៀត៖

9. តើអ្នកនឹងចាត់ទុកបច្ចេកវិទ្យាខាងក្រោមនេះជាផ្នែកនៃយុទ្ធសាស្ត្ររបស់អ្នកដើម្បីទប់ទល់នឹងបញ្ហាប្រឈមនឹងការប្រែប្រួលអាកាសធាតុដែរឬទេ?

យុទ្ធសាស្ត្រ	បាទ	ទេ
ការប្រើប្រាស់ពូជដែលធន់នឹងភាពការប្រឈម		
ប្តូរទៅប្រព័ន្ធដាំដុះដែលប្រសើរឡើង		
ការផ្លាស់ប្តូរនៅក្នុងពូជ		
បច្ចេកទេសគ្រប់គ្រងដីថ្មី (ឧ. ការភ្ជួររាស់សម្រាប់ស្រូវ, បច្ចេកទេសអភិរក្សធនធាន)		
ការផ្លាស់ប្តូរការគ្រប់គ្រងទឹក (ជំនួសវិធីសាស្ត្រសំណើម និងសម្ងួត, ធុងក្រោមដី, ដើមឫស្សីសម្រាប់បង្ហូរទឹក)		
បច្ចេកទេសគ្រប់គ្រងសត្វល្អិត និងជំងឺ		
ការអភិវឌ្ឍន៍ និងប្រើប្រាស់ពូជដំណាំដែលធន់នឹងសត្វល្អិត និងជំងឺ		
ពូជសត្វថ្មី		
ការកែលម្អការគ្រប់គ្រងសុខភាពសត្វ		
ការផ្លាស់ប្តូរប្រតិទិនដំណាំ		
ការផ្លាស់ប្តូរកម្រិតនៃការបញ្ចូលដែលបានប្រើ (ដី គ្រាប់ពូជ ។ល។)		
ការបង្វិលដំណាំ		
ផ្សេងៗ (បញ្ជាក់)		
គ្មាន		

10. តើអ្នកត្រូវការវគ្គបណ្តុះបណ្តាលអ្វីខ្លះ ដើម្បីបង្កើនជំនាញ និងចំណេះដឹងរបស់អ្នក ដើម្បីទទួលយកសម្របទៅអ្វីដែលបានរៀបរាប់ខាងលើ បានប្រសើរជាងមុន ? *(ការឆ្លើយតបជាច្រើនអាចឆ្លើទៅបាន។* *ការឆ្លើយតបដែលបានជ្រើសរើស* *តើអ្នកត្រូវការការបណ្តុះបណ្តាលដ៏សំខាន់បំផុតមួយណា?* *សូមគូសរង្វង់)*	1 □ការគ្រប់គ្រងសុខភាពគ្រាប់ពូជ 2 □ការគ្រប់គ្រងទឹក។ 3 □ការគ្រប់គ្រងផលិតកម្មដំណាំ 4 □ការគ្រប់គ្រងសារធាតុចិញ្ចឹម 5 □ការគ្រប់គ្រងសត្វល្អិត 6 □ក្រោយប្រមូលផល រួមទាំងការផ្ទុក 7 □ការគ្រប់គ្រងសត្វ 99 □ការបង្កើតប្រាក់ចំណូលផ្សេងទៀត៖

- បញ្ចប់ទម្រង់បែបបទរបស់បុរស-

ទម្រង់ B (ទម្រង់បែបបទរបស់ស្ត្រី)

- បញ្ចប់ទម្រង់បែបបទរបស់ស្ត្រី-

- ចុងបញ្ចប់នៃសំណួរស្នង់មតិ -

3. Fieldwork Activities