
DRAFT: Strategy to adapt to Climate Change for Michimikuru Tea Farmers in Kenya

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1. Sistematization of ROA process with Michimikuru in Kenya, AdapCC, 2008
Abreviations

1. AdapCC project background and objectives

Cafédirect (CD) and the German Technical Cooperation (GTZ) are implementing a three years Public-Private-Partnership (PPP) from 2007 to 2010 to strengthen smallholders' capacity to cope with climate related risks, to manage uncertainties and to adapt to changing climate conditions.

The main objective of the joint pilot initiative is to create transferable examples how pilot producer groups of Cafédirect's supply chain could cope with the impacts of climate change and how to improve their access to respective financial and technical support mechanisms¹.

AdapCCs' expected impacts include:

- + To **contribute to long-term sustainability** of coffee and tea production and thus saving revenues of the affected smallholders.
- + To **impact positively on climatic and environmental conditions** by implementing adaptation and mitigation strategies.
- + To **develop tools and methodologies** to identify and implement smallholder agricultural adaptation strategies.
- + To **reduce the vulnerability of smallholder** agricultural production practices against climate change.

All decisions and phases of the project are conducted in a participatory manner by and with the producer partners themselves. To create transferable examples AdapCC is working with four pilot producer organisations in Mexico, Nicaragua, Peru and Kenya.

The Risk and Opportunity Analysis (ROA) process in Kenya was held between October and December 2008 together with the Kenyan pilot group Michimikuru. Based on the analysed results and findings Michimikuru was supported to develop an own site-specific adaptation strategy to climate change and will be assisted by implementing that strategy in 2009.

The most threatening risks for the tea production, as identified by the farmers, are the changing precipitation patterns, prolonged drought periods and increasing extreme weather events resulting in the loss of yields and income. Michimikuru farmers are highly vulnerable against those impacts due several reasons, such as their high dependence on tea cultivated in monoculture, the extremely high deforestation rate resulting in degraded land and eroded soils and the inefficient use of natural resources.

Following the need for risk management strategies and adaptation measures the following key components of the adaptation strategy to changing climate conditions were worked out:

- 1. Capacity building in climate change issues and environmental conservation**
- 2. Good Tea Agricultural Practices and diversification**
- 3. Reforestation on degraded hills and sustainable forest management**
- 4. Improving the access to climate related information**
- 5. Distribution of findings and accessing financial and technical support mechanisms**

The present strategy illustrates the urgent needs for implementing the above mentioned components and recommends next steps and activities to be taken to implement specific adaptation measures.

¹ For further information see www.adapcc.org

2. Climate change affecting Michimikuru's tea production

Climate impacts on Kenya

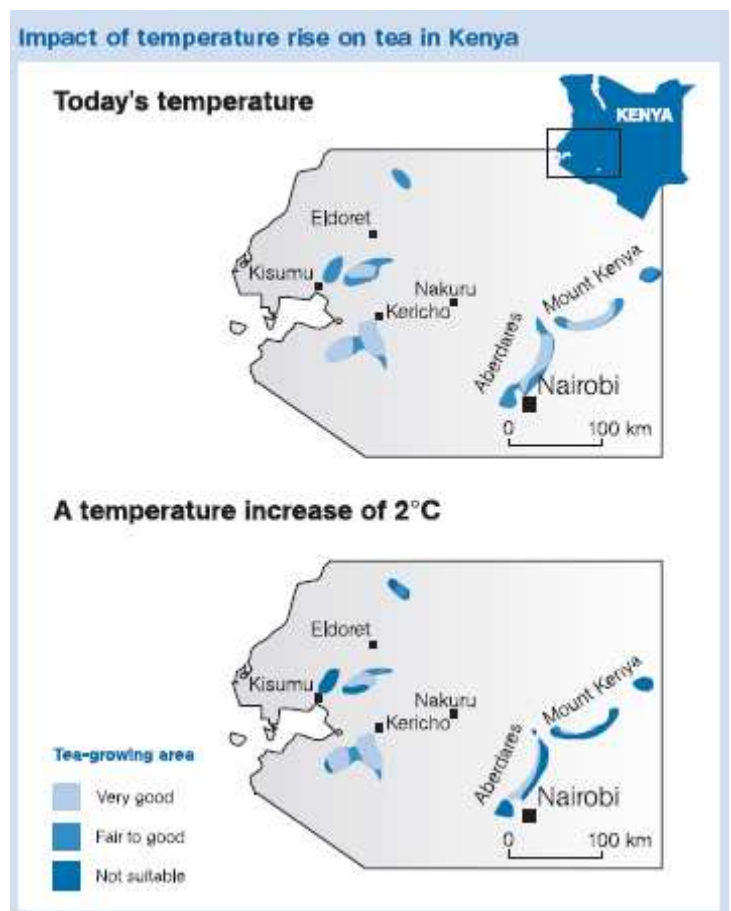
There are already proven changes in Kenya's climate which affect the tea production such as delayed rainfall, reduced rainfall, and destructive rainfall. Temperatures have been increasing since the 1950s in a trend that is similar to the global average. In 2008 Kenya has experienced prolonged droughts starting in April when this is supposed to be the wettest month. The country is also suffering from increasing weather extremes and the disappearance of the glaciers leading to the drying up of 26 river streams around Mount Kenya. These changes have already led to harvest losses and food shortages, a loss of biodiversity, landslides, and soil degradation. Pests and diseases for humans, plants and animals are increasing and the availability of water for agriculture and households becomes more and more unpredictable. The diminishing water sources and decreasing and sometimes erratic rainfalls have caused migratory communities to encroach on other communities and private lands, thus sparking bloody conflicts.

Future predictions

The CLIP² regional climate model forecasts a substantial increase in temperatures between 1.5 and 3 degrees C. The June-August season may experience more warming than the December-February season. The average annual rainfall may vary considerably by zone. Based on climate change scenarios³ northern Kenya will experience significant changes in rainfall and temperatures with some places becoming wetter and others drier. These changes will have dramatic impacts on ground cover and vegetation. All areas will see more variability of rainfall, intense storms, droughts and floods.

Climate Change affecting the tea industry

According to the 4th assessment report of the IPCC (2007) some arid areas will expand due to increased warming, and this is likely to encroach into areas suitable for coffee and tea cultivation. This means that communities already earning their livelihoods from tea and coffee face serious threats as their source of livelihood will be



Source: *Africa up in Smoke*, p. 7, 2005

² Climate-Land Interaction Project (CLIP) has simulated the effects of GHG and LUC on the future local and regional climate of East Africa. <http://clip/msu.edu>

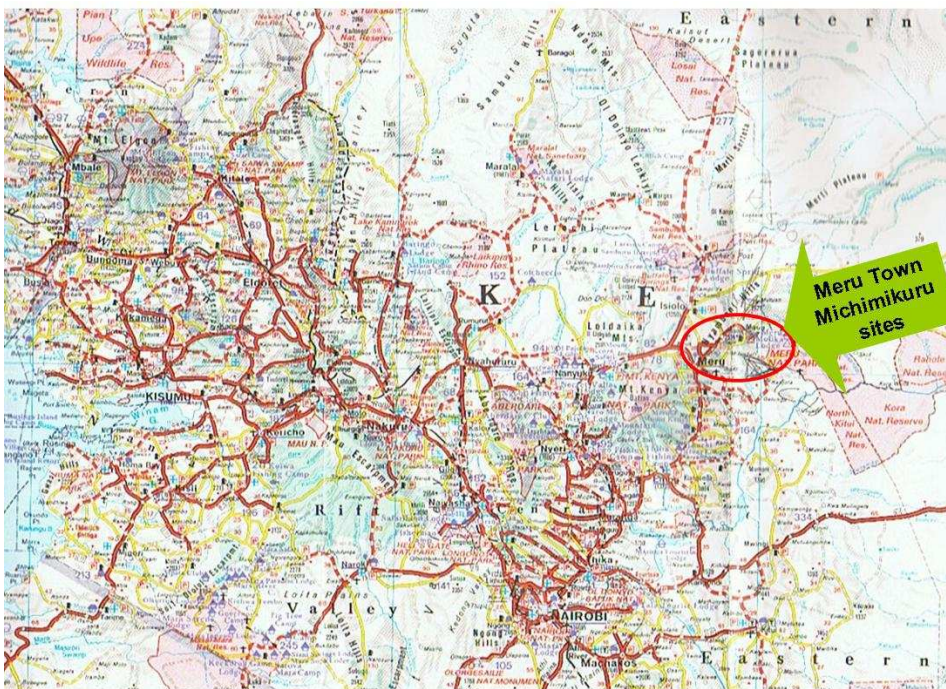
³ CLIP analysis and Intergovernmental Panel on Climate Change (IPCC) forecasts

disrupted.

If temperature rises by 2°C, large areas of Kenya currently suited to growing tea would become unsuitable. Kenya is the world's fourth-largest tea producer and second-biggest exporter. Tea covers nearly ¼ of the country's export earnings. 3 million Kenyans (10 %) are employed in the tea industry. 400,000 smallholders grow 60 per cent of the country's tea. Massive deforestation due to high energy-intensity of tea processing worsens environmental risks and climate change impacts

The AdapCC pilot group Michimikuru

The Michimikuru Tea Factory and Estate are located approximately 280kms North East of Nairobi. It is located 40kms north-east from Meru town. It is 11kms off the main Meru - Maua road and approachable through an unpaved all weather road. However, a contract has been awarded to tarmac it. It is located at 0.3 degrees north of the equator and on a longitude of 38 degrees east. It lies on a beautiful 1950m above the sea level saddle on the panoramic Nyambene Hills and within Tigania Administrative District.



Michimikuru factory is one of the many (60) that are under the management of Kenya

Tea Development Agency (KTDA). It produces black CTC⁴ teas. Michimikuru is unique in that it qualifies to be about the only one that has a nucleus estate owned by the farmers. It has approximately 9000 small scale growers and produces an average of 4million kgs of black CTC teas

per year (an average of 444kgs per farmer). 95% of which is exported to various destinations in the world. The Eastern Produce Kenya (EPK) established the estate and factory in 1960 but sold it to the local farmers in 1994. A desert like climate starts 10kms north of the factory and hence there is great vulnerability to climate changes. The area under tea among the farmers is approximately 1700Ha and the tea in the estate occupies 201Ha. Tea accounts for close to 80% of the household activities and brings in 90% of the family income. The average tea farm per household is slightly less than ½ acre. **Annual income from tea per farmer family???** Michimikuru is one of the few tea

⁴ Cut Tear and Curl – A type of tea manufacturing

factories in Kenya selling tea under the FLO Label. Cafédirect is the main supporter in buying Fair Trade tea⁵.

How tea farmers at Michimikuru perceive climate change - results of producer interviews

To identify the producers' perception of climate change Julius Ethang'atha, a consultant representing Imani Enterprise UK, realised short interviews with pre-selected producer partners in East Africa in 2007 on behalf of the AdapCC project. Altogether a total of 121 questionnaires could be completed at six tea factories in Uganda, Tanzania and Kenya.

The consultant visited the two Kenyan tea factories of Kiegoi and Michimikuru and a total of 45 people were interviewed including members of management, directors and farmers.

All the people interviewed stated that there have been considerable changes in climate patterns in their areas. Overall they reported:

- Important **modification of precipitation**: delayed rainfall, reduced amounts of rainfall, fewer days of rainfall with more intense and destructive rainfall
- **Increased temperatures** and drought
- **Changed wind patterns**: heavy winds

The two factories in Kenya are quite vulnerable to sudden climate changes as desert like conditions, which stretch all the way to Ethiopia, start only 10km away from each of them. Especially Kenya experienced occurrences of droughts.

Changes in the weather conditions affect the production in the tea and coffee sector. As the most important impacts farmers perceive:

Biophysical impacts:

- Changes in quality of soil: soil degradation/ landslides due to soil erosion, less fertile soil
- Changes in quantity of water resources: scarcity of potable water, less water availability
- Increased pests for plants, animals and humans
- Loss of biodiversity

Socio-economic impacts:

- Decline in yields, production and earnings
- Increased poverty
- Increased migration
- Changes in planting seasons

Based on pre-defined criteria⁶ and the results of the interviews held in 2007 the AdapCC project selected four pilot producer organisations to start more profound analyses and the development of exemplary adaptation strategies. While AdapCC focusses on three coffee producer organisations in Latin America the project worked out the present adaptation strategy together with and to be implemented by the Kenyan Michimukuru Tea Factory. To scale up lessons learnt and experiences to a wider number of producer partners will be one of the big challenges of the project approach during its last phase in 2010.

⁵ Sistematisation ROA, Julius Ethang'atha, 2008

⁶ For more information see AdapCC synthesis report 2008

3. Most serious risks and vulnerabilities and correlative root causes

The AdapCC Risk and Opportunity Analysis (ROA) process together with Michimikuru farmers in Kenya was realised between October and December 2008. ROA is a participatory process to identify adaptation measures for smallholder growers to regional changing climate conditions. The ROA process identifies **physical and social vulnerabilities** that can turn into disasters for the focal group in case an extreme weather event occurs or the regional climate changes. The methodology allows **estimating possible losses and damages** for smallholder families as a consequence of climate variability. Furthermore the ROA process serves to get better understanding of the **key drivers which influence the increasing risks and vulnerabilities** of the pilot group as well as their effects. Being aware of impacts and being able to estimate tendencies of climate change in a specific region allows deducing **possible adaptational measures** in order to minimise the risks of negative impacts by climate change and prioritising them.

Serious threats and vulnerabilities identified by ROA

To assess specific threatening risks and vulnerabilities of farmers or communities a WWF based toolkit⁷ is used. During a two-day-workshop farmers in facilitated working groups assess seasonal calendars, a time line summarizing the most threatening weather events, the communities' animal and plant inventory; they prioritise community values and identify relationships between climate risks, vulnerabilities and root causes. Finally based on their community values the farmers identify adaptation needs and elaborate as final result an action plan to be presented to a wider number of stakeholders to get support for implementing adaptation measures and link their needs with external private or political initiatives.

During this participatory local workshop farmers at Michimikuru identified six key problems threatening their families' livelihood:

1. Lack of money
2. Deforestation
3. Lack of alternative energies
4. Lack of environmental education
5. Crop failure
6. Tea monoculture

Only under the identified problem of "**Crop failure**" many direct climate related issues such as water shortages, changing rainfall patterns and rising temperatures are hidden and were partly identified by the producers through a thorough root cause analysis.

The other problems identified lead to more vulnerability towards changing climate conditions resulting in crop failure and yield loss because they are **lacking capacities and access to financial and technical support** mechanisms. Due to the **lack of alternative energies** they use fire wood for cooking and the processing of tea leaves. Without any reforestation activities to sustainably manage the available natural resources tea farmers are suffering from immensely **high deforestation rates** leading to destructed lands and soil degradation. Furthermore the high dependency on **tea grown in monoculture** makes tea farmers around Michimikuru very

⁷ See climate witness toolkit for tea producers, AdapCC 2008

vulnerable to changing climate conditions and weather events that negatively impact on crop yields. Tea as a monoculture contributes to soil degradation and water shortages. There is very few other crop production or biodiversity left on the green hills surrounding the Michimikuru tea factory⁸.

Risks		Root Causes	Vulnerabilities
Loss of income	Declining or loss of yields	Pests and diseases	Tea monoculture Lack of money for pesticides Lack of knowledge for an efficient pest management Changed climate conditions, e.g. increased temperatures Old plants/ tea bushes
		Inadequate climate conditions as <ul style="list-style-type: none"> ➤ decreasing and changing precipitation patterns ➤ extreme weather events causing landslides ➤ increasing temperatures 	Poor soil fertility Few water storage capacities Inefficient water use and distribution Tea monoculture Lack of money to invest in GAP ⁹ Lack of knowledge on GAP Unsustainable use of natural resources Environmental destruction
		Poor soil fertility	Tea monoculture Unsustainable landuse practices Poor fertilizer application Little (agro)-/biodiversity

4. Identified adaptation needs and options

Adaptation needs – what farmers would do to cope with climate change

Michimikuru farmers identified some activities to be undertaken to reduce the above mentioned vulnerabilities. Reducing vulnerabilities means coping with changing climate conditions and their resulting risks. To be better prepared for natural hazards such as water shortages, extreme weather events or prolonged droughts the tea farmers need to **build up capacities** regarding GAP and sustainable management of natural resources like water, forest or biodiversity. Hence they are seeing the need for **environmental education** to improve their understanding and actions regarding the conservation of nature. **Planting trees**, enabling or improving the **efficient use of**

⁸ For more detailed information see sistematization ROA Kenya, AdapCC, 2008

⁹ Good Agricultural Practices

energy, especially of fire wood, and the search for **alternative energy sources** is another main aspect to improve their living standards and agricultural production conditions.

To reduce their high dependence on tea as a cash crop Michimikuru farmers see the need to **diversify their income** and to **revive traditional farmers' knowledge** regarding Good Agricultural Practices and the sustainable use of resources. To receive better crop yields tea framers also need to use **good quality seeds** and invest in their **self managed nursery**, not only for tea plants but also for native trees and other ecologically needed plants of the local biodiversity¹⁰.

Traditional coping strategies

5. Appropriate Adaptation Strategy

To meet the above illustrated needs to cope with changing climate conditions and other environmental risks threatening the yields, and thus the livelihood of Michimikuru tea farmers, the implementation of defined activities to mitigate risks and avoid future losses and damages is necessary. The AdapCC initiative supports the producer organisation in developing an adequate adaptation strategy to climate change and to plan the implementation of specific measures financially and technically supported by AdapCC.

The strategy based on the above mentioned results should concentrate on some key components:

- **Capacity building in climate change issues and environmental conservation**
- **Good Agricultural Practices and diversification**
- **Reforestation on degraded hillsides and sustainable forest management**

Besides addressing the above mentioned risks and vulnerabilities one needs to **improve the access to climate related information** regarding future predictions and impacts on smallholder tea production systems. Hence it is recommended to include corresponding activities.

The presented components should include:

- Short-term technical solutions for reducing the vulnerabilities of the producers and of the tea ecosystem for being able to manage climate related risks (no-regret measures)
- Short-term technical solutions for adapting the tea production and its processing to climate variability (no-regret measures)
- Long-term strategies for improving framework conditions for adapting to future climate risks and for capacity building

Furthermore the **distribution of findings and results** is essential so that more farmers in Kenya and beyond can benefit from pilot case experiences and strengthen their capacity to cope with climate change.

As AdapCC is limited in its resources and timeframe the project will also support Michimikuru to get **access to long-term technical and financial support mechanisms**.

¹⁰ For more detailed overview of identified and agreed activities see annex 1

Project Planning Matrix

Based on the activities farmers defined and discussed with external stakeholders during the ROA process the operational plan to implement the adaptation strategy should include the following specific activities:

1. Capacity building in climate change and environmental conservation

OBJECTIVE I:	Michimikuru tea producers are sensitised for climate change issues and apply the necessary activities within the production to minimise their vulnerabilities towards climate related risks.
KEY ACTIVITIES	Impacts of climate change on tea production and adaptation options Good Agricultural Practices for strengthening the tea ecosystem Options to diversify farmers' income Water Management, Pest Management & Fertilizer Application
OBJECTIVE II:	Michimikuru tea producers are sensitised for environmental conservation issues and apply activities to conserve nature and sustainably manage the use of natural resources.
KEY ACTIVITIES:	Environmental Education Efficient Use of Energy Sustainable Land Management and Forestry

To design the content of the demanded capacity building measures it is necessary to find a partner institution with technical expertise and experience in developing didactic materials. Furthermore Michimikuru needs to plan the timeframe and complexity of their capacity building programme and plan specific activities to undertake.

To support the capacity building activities in the context of ROA some institutions already affirmed their interest in collaborating with Michimikuru:

- **KENFAP¹¹**: - the organization is prepared to register Michimikuru as one of its members. Michimikuru could benefit from their educational programmes.
- **KARI¹²**: - resource directed but working on opportunities to develop early maturing and tolerant varieties plus traditional crops deemed to be getting extinct. There is need to sensitise farmers on water conservation and harvesting. The institute is prepared to work with Michimikuru when invited to do so. (Dr. Wafula)
- **ASAL¹³**: - they are ready to collaborate with Michimikuru in capacity building and reestablishing tree cover.

¹¹ Kenyan National Framers and Agricultural Producers

¹² Kenyan Agricultural Research Institute

¹³ Arid and Semi Arid Lands

- **KFS¹⁴**: - will continue to support and boost planting trees, also for wood fuel. They will be ready to offer training and planting materials. Within the region seedlings are readily available in the market (Mr. Ndambiri). There is a threat of serious effects on monoculture as a result of emergence of diseases and pests which will hinder the sustainability of farming activities. They will also work closely with Michii to counter forest destruction and promote conservation.
- **TRFK¹⁵**: various research aspects and resource base for climate data (John K. Bore)
- **PSDA GTZ¹⁶**: energy efficiency and cooking stoves

The present adaptation strategy should be presented to those institutions and they should be involved in further operational planning.

2. Good Agricultural Practices and diversification

OBJECTIVE I:	The producers apply an efficient water management within their production.
KEY ACTIVITIES	Exploration of potential of irrigation systems Exploration of enhanced water storage possibilities
OBJECTIVE II:	Attacks of pests and diseases decrease and the tea is less vulnerable to them.
KEY ACTIVITIES:	Regulation of the application of pesticides Natural pest / disease control Enhanced soil fertility
OBJECTIVE III:	Producers have access to more climate resistant good quality tea seedlings and cultivate other crops to reduce the dependence of tea as a monoculture.
KEY ACTIVITIES:	The impacts of a changing climate on crops like tea is not yet analysed sufficiently. Hence observing and measuring the influence of experienced climate and weather conditions on tea plants is recommended. <ul style="list-style-type: none"> • Get variety of tea plants and seedlings • Install weather station and monitor weather conditions like temperatures and rainfall • Install experimentation fields with various types of tea growing under the same weather conditions and evaluate specific crop yields and plant development • Link with other tea producer organisations / involve multiplying and supporting institutions like e.g. KTDA

¹⁴ Kenyan Forest Service

¹⁵ Tea Research Foundation of Kenya

¹⁶ Programme on Sustainable Development of Agriculture of German Technical Cooperation

- Sistematise and disperse traditional knowledge regarding diversification and crop cultivation

Potential partner institutions:

- **Ministry of Agriculture:** - an earlier study shows malnutrition in the area. The ministry is ready to work closely with Michimikuru to offer expertise in diversification of crops. The Environmental Department will introduce Michimikuru to MAP (Medicinal and Aromatic plants) project. The District Environmental Development Officer pledged to support and work in collaboration with Michi to manage and conserve the environment. (Abraham Miaka)
- **KARI:** - resource directed but working on opportunities to develop early maturing and tolerant varieties plus traditional crops deemed to be getting extinct. There is need to sensitise farmers on water conservation and harvesting. The institute is prepared to work with Michimikuru when invited to do so. (Dr. Wafula)

The present adaptation strategy should be presented to those institutions and they should be involved in further operational planning.

3. Reforestation on degraded hillsides and sustainable forest management

OBJECTIVE I:	The forest cover in the focal region is maintained and measures for amplification are in place.
KEY ACTIVITIES	<ul style="list-style-type: none"> Stop illegal logging on community level Tree nurseries for local species Identification of alternatives for construction Identification of alternatives for energy generation for processing the tea Long-term sustainable forest management

Potential partner institutions that should be involved in further operational planning:

- **KFS:** - will continue to support and boost planting trees, also for wood fuel. They will be ready to offer training and planting materials. Within the region seedlings are readily available in the market (Mr. Ndambiri). There is a threat of serious effects on monoculture as a result of emergence of diseases and pests which will hinder the sustainability of farming activities. They will also work closely with Michii to counter forest destruction and promote conservation.
- **ASAL:** - they are ready to collaborate with Michimikuru in capacity building and improvement on tree cover.

4. Improving the access to climate related information

OBJECTIVE I:	Producers have access to climate related information like future predictions and resulting impacts and are able to include the forecasts in their long-term strategies.
KEY ACTIVITIES	Evaluate CLIP results Discuss realisation of study on climate impacts on future tea production areas

Potential partner institutions:

- **Climate Network Africa (CNA):** - the organisation is ready to offer update information through publications.
- **KARI:** - resource directed but working on opportunities to develop early maturing and tolerant varieties plus traditional crops deemed to be getting extinct. There is need to sensitize farmers on water conservation and harvesting. The institute is prepared to work with Michimikuru when invited to do so. (Dr. Wafula)
- **TRFK:** - various research aspects and resource base for climate data (John K. Bore)

5. Distribution of findings and access to support mechanisms

OBJECTIVE I:	Tea farmers in Kenya and beyond have access to the experiences knowledge and methodologies of the present case study.
KEY ACTIVITIES	Sistematised and evaluate results Realise final workshop to present results from case study to other tea organisations in Kenya and East Africa
OBJECTIVE II:	Michimikuru tea farmers have improved their access to financial and technical support mechanisms regarding the identification and implementation of adaptation strategies to climate change.
KEY ACTIVITIES:	Map adequate support mechanisms and present them to producer organisations Train technical and management staff in accessing funding mechanisms

Potential partner institutions:

- **IMANI/ Cafédirect/ Cafédirect Producers Ltd. (CPL)**
- **Climate Network Africa (CNA):** - the Organization is ready to offer update information through publications.
- **KTDA¹⁷?**

¹⁷ Kenyan Tea Development Agency

7. AdapCC contribution

Framework conditions and criteria ... *to be completed by AdapCC management team*

8. Next steps and recommendations

To agree about the present adaptation strategy and to start implementation of concrete measures as fast as possible the following steps need to be taken immediately:

Activity	Date	Responsible
agree on project coordinator within Michimikuru under the Unit Manager	15th Jan. 2009	Michimikuru
discuss adaptation strategy with pilot group and potential partner institutions	15th Feb. 2009	AdapCC (Kathleen Schepp), Michimikuru
develop Operational Plan on measures to be implemented	15th Feb. 2009	Michimikuru (with support of AdapCC and Julius Ethan'gatha)
agree on MoU about implementation phase and AdapCC contribution	23 rd Feb. 2009	Michimikuru, AdapCC (Kathleen Schepp)
realise operational planning workshop to complete adaptation strategy, operational plan, MoU and agreements with partner institutions	between 21 st and 23 rd Feb. 2009	Michimikuru, Julius Ethang'atha, AdapCC (Kerstin Linne, Kathleen Schepp)
transfer budget from Cafédirect to Michimikuru project bank account	25th Feb. 2009	Cafédirect (Wolfgang Weinmann)/ Michimikuru
start implementation of specific activities (e.g. realise kick-off workshop to win farmers' commitment)	1 st Mar. 2009	Michimikuru, Julius Ethan'gatha