



## **Climate Change, Vulnerable Communities and Adaptation**

### **Report on Tanzania testing**

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## 1. Introduction

IUCN, IISD, SEI-B and Intercooperation have developed a tool to enable project planners and managers to assess and enhance a project's impact on community-level adaptive capacity. Specifically, the tool has been structured to:

- 1) Set the climate context: Identify the impacts of current climate hazards and climate change in the project area, particularly on local livelihoods
- 2) Set the livelihood context: Identify the resources needed to help people conduct their livelihoods and cope with these impacts
- 3) Screen project activities: Assess how project activities affect the availability and access to resources that are central to livelihoods and coping strategies
- 4) Manage climate risk: Adjust the project so that opportunities to enhance resource availability / access are strengthened, and activities that undermine activities/access are adjusted

In an effort to render this tool as useful as possible, the partner organizations decided to conduct a series of field tests on planned or ongoing natural resource management projects in Africa, South Asia, and Central America. The tests involve project team members travelling to the project sites to work with local project managers and community members in gathering relevant information and applying the tool, developing recommendations on how to adjust project activities so that they take into account their impact on local adaptive capacity.

The third field test took place in Tanzania, during 17 - 25 February, 2006. Carmenza Robledo (Intercooperation) travelled to Tanzania to work with the Rural Livelihood Development Company (RLDC)<sup>1</sup> and an NGO (LVIA), in testing the tool on one of LVIA's projects. The project selected was, "*Alleviating poverty in 13 villages by improving household livelihoods through increased utilization of local income potentials that correspond to available market opportunities*" See Annex 1 for map, and Annex 2 for trip agenda. Katharina Häberli, from the Swiss Cooperation Office in Dar Es Salaam joined CR and the two organisations at the end of the mission.

### Tanzania<sup>2</sup>

The United Republic of Tanzania lies south of the Equator between latitudes 10S and 120S, and between longitudes 300E and 410E. It is located between the Great Lakes of Victoria, Tanganyika and Nyasa. It shares borders with Kenya to the North, Uganda,

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<sup>1</sup> RLDC is a non-profit company implementing the Swiss funded Rural Livelihood Development Program (RLDP) which aims to increase income and employment in poor rural households of Central Tanzania. RLDC has been set up in 2005 by the two Swiss organizations, Intercooperation and Swisscontact, which provide technical assistance under RLDP.

<sup>2</sup> Extracted from the initial National Communication from the United Republic of Tanzania to the UNFCCC, 2003

Rwanda and Burundi to the Northwest, the Democratic Republic of Congo to the West, Zambia, to the Southwest, and Malawi and Mozambique to the South.

The total area is 945,000 square kilometres with the Mainland covering 939,702 square kilometres. According to the Initial National Communication for the UNFCCC forests and woodland occupy 50 percent of the total area and 25 percent is wildlife reserves and national parks. The coastline extends 800 kilometres from 4oS to 10oS. Except for the coastal belt most of the country is part of the Central African plateau lying between 1,000 to 3,000 meters above sea level.

The country has a great diversity of climatic conditions with annual mean temperature ranging from a mean daily temperature of between 24°C - 34°C. Within the plateau, mean daily temperatures range between 21°C - 24°C while in the highland areas temperatures range from 15°C - 20°C. The country experiences a mean annual rainfall varying from below 500 mm to over 2500 mm annually, largely depending on altitude. Rainfall in Tanzania is of two regimes. Some parts of the country receive bimodal rainfall, long rains during the months of March to May and short rains during the months of October to December. Other parts experience a unimodal rainfall pattern whereby most of the seasonal rainfall is during the months of December to April. In both patterns there is a long dry season from May to October. The hottest months are December to February and the coolest months are June to August.

In the beginning of this decade the Gross Domestic Product (GDP) has been growing at an average rate of 4 percent per annum with the population growth rate being 2.8 percent per annum. Agriculture contributes 49.6 percent of the GDP, whereas 8.1 percent comes from the manufacturing industry, 1.3 percent from mining and quarrying. The share of services sector to the GDP is 36.4 % and construction sector is 4.6%. Estimated share of the informal sector to the GDP is 32%.

Tanzania had an estimated population of about 34 million, and 18 percent of the population lives in urban areas. Tanzania is ranked as one of the poorest countries in the world, with per capita income of USD 156.1 per year for the year 1994. The extent of poverty among Tanzanians is high. It is estimated that 48 percent of Tanzanians live in poverty condition, while 36 percent live in very poor conditions. Average earnings do not meet requirements for basic minimum needs.

### **Region of Dodoma**

The area of Dodoma is located in the semi-desert zone in central Tanzania. The zone has a rainfall of less than 600 millimetres per annum and receives the bimodal rainfall pattern, with long rains from March to May and short rains from October to December. Agricultural activities as well as migration patterns from nomad pastoralists are determined by these two rain seasons.

During the field trip the community in all three sites reported that the rain season October – December, 2005 “didn’t arrive”. Communities also reported that a year with such low / late rains has not been experienced since the 50s. This perception was validated by meteorological data from the region. Consequently, this 2005 extreme drought was the

major climatic hazard experienced by the community, and its impacts and the related coping strategies developed by the community played an important role in the interactions with the community representatives during the testing of the CRYSTAL tool.

The Initial National Communication for the UNFCCC sees decreases in rain as one of the main impacts of climate change for the country. According to this document, irrigation will be required for those areas getting less rainfall to substitute for moisture losses due to increased evapo-transpiration. Drought resistant crop varieties will be required. Under such conditions irrigation will most likely tend to be expensive because of reduced river runoff and the vulnerability of shallow wells necessitating the development of deep wells instead. Precisely, the target groups of the programmes used to test the CRYSTAL tool in Tanzania were poor communities which could not afford the cost of such irrigation strategies or drought resistant crop seeds. Consequently, our aim was to look for other coping strategies more achievable for poor livelihoods.

## **2. Summary of Activities**

### **2.1. Preparation:**

Prior to field testing, IUCN-IISD-SEI-IC team members reviewed a project document, which outlined the purpose, objectives and specific activities of the RLDP project, as well as its social, environmental and policy context. Further research on Tanzania's climate change impacts, adaptation initiatives and policy responses was also conducted.

Upon arrival in Dodoma, meetings with the partners involved in the testing were undertaken. The aim of this meeting was to a) update all participants in possibilities and limitations related to activities for Sustainable Management of Natural Resources in the framework of the UNFCCC; b) present the "*Orientation on Climate Change, Natural Resource Management, Livelihoods and Food Security*" by NRU/SDC as well as the Program on "*Capacity Building in Climate Change and Natural Resource Management for partners of the Swiss Development Cooperation in selected countries*" (SDC/IC) and c) finalize the preparation of the field work. .

### **2.2. Testing:**

The testing was initiated with field work in three different villages; Makoya, Chingali 2 and Manchali all nearby Dodoma. In each village a meeting was held to discuss the key elements included in the CRYSTAL tool. The aim of the meetings in these villages was to understand the perception in the community about four major issues as included in the CRYSTAL tool:

- a) Observed climate variability (climate hazards)
- b) Impacts of the climate variability on livelihoods

- c) Coping strategies developed by the community (“autonomous adaptation”)
- d) Expectations for future climate scenarios

As already mentioned, during the test activity, one of the strongest drought periods was experienced. Consequently, interaction with the community concentrated only on one climatic hazard, namely drought.

In Makoya, around 25 persons (all adults including 30% of elders and over 35% women) participated in the meeting. In the second village, Chingali 2, around 19 people attended the meeting and 20% were women. Participants in Changali 2 were mainly elder people (over 60 years old). This group of elders was selected as a control group for validating the assumption that drought periods like the one currently experienced were not frequent in the past. The team conducting the test observed that due to their elevated age, their capacity to be more flexible in coping with climate hazards is reduced as they cannot easily migrate or cover longer distance for getting food from the surrounding secondary forest. That makes this social group especially vulnerable. However they remembered the coping strategies used in the past main drought 50 years ago. This input allowed to consider more coping strategies during the sessions running the whole CRYSTAL tool.

#### *Their livelihoods*

In all villages we found that community members belong to different tribes (e.g. Wagogo or Maasai). They rely on the use of natural resources for their survival, especially grasslands and agricultural lands. Pastoralists have cattle as well as small animals, mainly goat and to a lesser extent sheep. Seasonal migration is common among pastoralists. However, due to a decrease of grazing land some cattle owners are facing difficulties. Main food crops are maize, sorghum and millet as well as tuber crops like cassava and sweet potato. Young people tend to migrate to bigger cities, especially Dodoma, but even to Morogoro and Dar es Salaam. Community members reported an increment in HIV infected persons, especially among the younger generation. This is creating an additional stress on older people, who reported to often find themselves fostering their grand children, because their own children are sick or dead. Self-help initiatives in the villages visited arise as a result of cooperation projects, as those promoted by LVIA and other agencies. However a deep tradition on self-help and self- organization was not observed. This can be due to different cultural backgrounds and perhaps also social structures.

### **2.3. Wrap-Up:**

Following the testing of the tool with the community, Carmenza Robledo, Felix Bachmann, Stellah Rwiza, Federico di Filippo and Japhet Chamgeni spent a day going through the results of the field test, entering answers/responses into the MS Word version of the tool, and adjusting or adding information as needed (at the discretion of project officers based in Tanzania).

### 3. Results of Tool Testing:

Using the steps and processes outlined in the MS Word version of the tool, a summary of the results of the participatory tool testing are provided below.

*Region:* Africa

*Country:* Tanzania

*Ecosystem:* Dry land agricultural zone

#### 3.1. Climate Profile

**Table 1: Summary of the most important direct and indirect impacts in the villages visited**

Climate Hazard	Direct impacts	Indirect impacts
<b>Drought</b>		
	1. Crop damage	1. Household food security
	2. Water shortage	2. Erosion of savings
	3. Livestock weak/sick/dead	3. Reduction in grazing lands
	Reduced water quality	Reduced water quality
	Reduced soil fertility	Soil erosion
	Desertification	Depletion of grain stores
		Income loss
		Social tension and conflict
		Loss of trees
		Unemployment
<b>Stark winds</b>		
	1. Increased soil erosion	1. Reduced soil fertility
	2. Reduced air quality	2. Desertification
	3. Disease	3. Reduction in grazing lands
	Desertification	4. Income loss
	Loss of trees	Injuries
	Damage of dwellings	Spreading of fires
	Crop damage	
<b>Extreme temperatures</b>		
	1. Water shortage	1. Desertification
	2. Loss of life	
	3. Crop damage	

Additional to the steps included in the tool we analyzed the causal relationship between direct and direct impacts (see table 2).

Table 2 Causal relationship between direct and indirect impacts

	DROUGHT	Indirect impacts		
		Food insecurity	Erosion of savings	Reduction of grazing land
Direct impacts	Crop loss/damage	↑	↑	X
	Water shortage	↑	X	↑
	Sickness/weakness and death of livestock	↑	↑	X

↑ Direct impact causing an indirect impact

X: No relationship between direct and indirect impacts

The framework given by the relationship between direct and indirect impacts was used for identifying the most important coping strategies (see table 3)

Table 3: Coping strategies identified in the villages surrounding Dodoma

	DROUGHT	Indirect impacts		
		Food insecurity	Erosion of savings	Reduction of grazing land
Direct impacts	Crop loss/damage	<ul style="list-style-type: none"> <li>• Food aid,</li> <li>• Planting new crops,</li> <li>• Using NTFP and charcoal,</li> <li>• Casual labour,</li> <li>• Income diversification and migration</li> </ul>	<ul style="list-style-type: none"> <li>• Casual labour,</li> <li>• income diversification</li> <li>• Migration of young people,</li> <li>• loans,</li> <li>• micro-financing (within the family/town)</li> </ul>	X
	Water shortage	<ul style="list-style-type: none"> <li>• Cover longer distance to fetch water,</li> <li>• getting/selling water,</li> <li>• Water rationing,</li> <li>• Asking for infrastructure for water harvesting</li> </ul>	X	<ul style="list-style-type: none"> <li>• Seasonal migration (with the livestock),</li> <li>• asking for infrastructure to harvest water</li> </ul>
	Sickness/weakness and death of livestock	X	<ul style="list-style-type: none"> <li>• Selling, Looking for other grazing land</li> </ul>	X

Special attention should be given to some coping strategies. At first we observed that the use of NTFP including the production of charcoal was an important coping strategy. The source of NTFP and charcoal is in the surrounding secondary forest. This forest is in different stages of degradation/succession. The State has the ownership of the forest and recently underlined its efforts with regard to forest conservation (and less to sustainable forest management). As a consequence a total ban on production of charcoal in/from forest areas was set at the beginning of the year. Nevertheless the market for charcoal is increasing, and rural households see charcoal as a source of cash income, especially during extreme droughts, when other products are negatively affected. Such a situation



requires some flexibility and improvements on local capacities so that charcoal can be produced on a sustainable way while ensuring that other goods and services provided by the secondary forest can be promoted. RLDC presently supports a pilot project for a more efficient and eco-friendly production of charcoal; the project itself is implemented with technical assistance from Energy for Sustainable Development Africa (ESDA) based in Nairobi. After testing the tool the relevance of the project as a mean for increasing sustainability of an existing coping strategy was better understood. This understanding will be an important element in the discussion with the government institutions dealing with NTFP and in particular with the charcoal issue. It is expected that by understanding the importance of this activity as well as testing the possibility for more sustainable practices an adjustment in the legal framework will be possible.

Further we considered that it could be useful to add another step to the tool aiming at a better understanding of the management practices that exacerbate negative impacts or increase resilience. A first attempt for such an analysis is presented in table 4 for its consideration.

Table 4: Incremental factors to climate impacts

Management activities that potentially increase the impact				Management activities that potentially reduce the impact		
Water	Agricultural land	Forest	Direct impacts	Forest	Agricultural land	Water
			Crop loss			
			Water shortage			
			Livestock sickness/death			
			Indirect impacts			
			Food insecurity			
			Erosion of savings			
			Reduction of grazing land			

### 3.2. Livelihood Profile

Table 5: Summary of some linkages between resources by type and coping strategies

Resource Type	RESOURCES IMPORTANT FOR LIVELIHOODS	TO WHAT EXTENT ARE RESOURCES AFFECTED BY DROUGHT	HOW IMPORTANT ARE RESOURCES TO COPING STRATEGIES IDENTIFIED ABOVE?
Natural Resources	Forest lands	3	5
	Agricultural lands	5	5
	Grazing lands	4	3
	Water bodies (excluding rivers)	5	4
Physical Capital	Agriculture implements (inputs)	5	5
	Water infrastructure	0	5
	Grain storage installations	0	5
	Banks	0	5
	Bicycles	0	5
Financial Resources	Cash	5	5
	Savings	5	5
	Loans	5	5
	Liquid Asses	5	5
	SACCOS	5	5
Socio-political Capital*	Governmental org.	0	5**
	Political org. (related to political parties)	0	0**
	Church based NGOs	0	0
	Member organisations / CBO (Farmers)	0	not clear
	Other NGOs	0	5
Human Resources	Basic agricultural skills	0	5
	Basic livestock keeping skills	0	5
	Educational skills (already very low in villages considered)	5	0

\* It could be useful to differentiate between formal (registered) and informal (unregistered) socio-political resources

\*\* Activities of governmental institutions are often linked to presence and engagement of a given party in a village.

### **3.3. Project Activity Screening**

In the case of Tanzania we concentrated our efforts on the field activities undertaken by the project on “*Alleviating Poverty in 13 Villages by Improving Household Livelihoods Through Increased Utilisation of Local Income Potentials that Correspond to Available Market Opportunities*”. This is a project financed by the Government of Navarra, Spain (€ 236.000). We selected this project because it has ongoing activities that directly involve many farmers and its more important organisations. The project is being implemented by WOPATA, L.V.I.A, AFREDA and INADES.

The general objective of the project is to improve the livelihood status of the rural communities through the promotion of new income generating activities at household level. Communities will be able to meet basic needs such as to have good shelter and clothing, attain better education levels, afford necessary health services and enhance investment in production while maintaining adequate household food security status. To achieve this main objective, the project will thrive to reach the following specific objectives:

- i. To enable the communities to explore and utilise commercial opportunities available in their local areas
- ii. To enable the communities to prepare household-based economic plans
- iii. To build the capacity of the communities to produce profitable and marketable goods
- iv. To enable the communities to identify potential markets for the goods they generate and help them to develop efficient linkages

These objectives are pursued through participatory training workshops to facilitate the introduction of technologies adaptable to the existing production structures that will improve production efficiency. The transferred technologies should entail the introduction of micro-processing factories for sunflower seed oil, grain milling and salt extraction, the improvement of beehives with mobile honey extractors, the introduction of vaccination kits for chicken, and the introduction of adapted poultry breeds with a high rate of growth. Regular local exchange visits among farmers and tradesmen will be facilitated in order to develop solid marketing structures between the communities and the markets. The project also provides small grants to the communities to enable them acquiring facilities for adopting the transferred technologies. Community based institutions (groups/teams) will be developed or the existing ones reinforced to manage cost intensive facilities such as micro processing machines and/or social economic organisation structures.

This project represents a complement to previous food security interventions that let these communities go beyond production activities for survival and engage in cash productive activities to bring them out of the existing vicious cycle of poverty.

The specific activities considered in the tool testing were:

- Improvements on crop production
- Processing and marketing

- Production and marketing of honey

The next step presented in the tool corresponds to screening the impacts that project activities could have on those assets identified as being strongly affected by climate change and/or important to coping strategies (see table 6)

As the project activities considered were designed under the lens of the livelihood approach, the general impact of this specific project on the main assets is considered as positive. This is especially relevant with regard to the financial resources, on which many coping strategies are based.

Table 6: Impacts from the project activities on the key resources of the livelihood

	Improvements in crop production	Processing and marketing	Production and marketing of honey
<b>Natural resources</b>			
Forest lands	0	0	+
Agricultural lands	+	+	0
Grazing lands	0	0	0
Water bodies	-	-	0
<b>Physical capital</b>			
Agriculture implements	+	0	0
Water infrastructure	+/-	+/-	0
Grain storage installations	+	+	0
Banks	0	+	+
Bicycles	0	0	0
<b>Financial resources</b>			
Cash	+	+	+
Saving	+	+	+
Loans	+	+	+
Liquid Assets	+	+	+
SACCOS	+	+	+
<b>Socio-political capital</b>			
Governmental organisations	0	0	0
Political organisations (parties)	0	0	0
Church based NGOs	0	0	0
Member organisations	+	+	+
Other NGOs	0	0	0
<b>Human resources</b>			
Basic agricultural skills	+	+	0
Basic livestock keeping skills	0	0	0
Educational skills	0	0	0

### 3.4. Project Adjustments

As already mentioned, the activities considered during the tool testing are highly dependent on the main natural resources available to the rural households. Besides, project activities are also aimed to especially improve the financial resources in the livelihood. We realised as a consequence of this approach that for adjusting project activities considering future climatic conditions it is necessary to screen the impacts that project activities can expect due to changes/increments in climate variability. Therefore, the team working in Dodoma decided to include a further step for screening potential impacts that changes in climate variability could have on the project activities (see table 7).

Table 7: Impacts of drought on project activities

	<b>DROUGHT</b>	<b>Crop production</b>	<b>Processing &amp; marketing</b>	<b>Honey production and marketing</b>
	Crop loss	↑ –	↑ –	X
<b>Direct impacts</b>	Water shortage	↑ –	X	↑ –
	Livestock sickness/death	X	X	X
	Food insecurity	↑ –	↑ –	↑ –
<b>Indirect impacts</b>	Erosion of savings	↑ –	X	X
	Reduction of grazing land	X	X	X

↑ – means a negative impact on the project activity  
 X means no impact on project activity

The three project activities are highly vulnerable to drought. Special attention should be given to the fact that once crop production gets a reduction in productivity, the second activity, processing and marketing, can be indirectly affected. Therefore some drought resistant species should be considered especially if planting is scheduled considering the short rain period (December to February), because this is the raining period that is likely to show more variability. Equally important is the possibility to consider a larger group of products for direct consumption (at present mainly maize, beans) as well as for processing and marketing (at present sunflower, vegetables)

## 4. Lessons learned

Generally speaking the participants of the test founded the tool useful. It helps to analyse how changes in the climatic system could affect the livelihoods with regard to ongoing or planned activities in a given project. It is also useful for simplifying the complexity of “climate change” into the realities of daily life. However the tool needs to become more user-friendly. In this section of the report some difficulties in using

the tool and some proposals for improvement are discussed. Additionally potential synergies with ongoing activities in Tanzania are presented. Finally some initial thoughts are listed regarding how to go beyond simply screening risks and coping strategies towards assessing vulnerabilities at the livelihood level.

### **Comments on the tool by sections**

- **Setting the climate context:** some of the relevant issues to be reviewed in this section are:
  - To reduce the options given in the subsections. Even better would be to give some examples to the users and then to let them decide, which are the potential impacts relevant for the given region.
  - To differentiate between direct and indirect impacts and establish the linkages between them. A new table will be needed. The present report presents an example (table 2).
  - To include screening resource management practices that can exacerbate impacts or increase resilience (see table 4).
  - To review if it is possible to use the matrices format in the software version of the tool. In the exercises made in India and Ecuador as well as in the testing undertaken in Tanzania, this format appeared to be more user friendly than the format in tables presented in the first software version. Examples of such matrices are provided in this report.
  - Regarding the identification of current coping strategies, members of the team in Tanzania observed that the answers given by community members are often only related to the short time. That is partially a result of the personal agenda (e.g. if the representative giving this information is engaged in a particular project or in a particular political party).
  - Another comment by the team involved in Tanzania is the need for validating the results of each step, especially the setting of climate context.
  
- **Setting the livelihood context:**
  - To simplify this section as it is shown in the reports from Mali and Tanzania, so that it could be more easily adopted and used as a basis for the next two sections.
  
- **Screening project activities**
  - It is important to simplify this section too. The major issues to be screened in this section are: a) How does the project affect the main assets/resources in the livelihoods?; b) How changes in the climatic system could affect the project activities?; and c) Is there a link between project activities and coping strategies? Again, using matrices as basic format could be an alternative for simplification.
  
- **Adjusting project activities as a mean to manage climatic risks**
  - *“The final step – i.e. on project adjustments – is still unstructured, and indicators may only be a starting point for identifying or developing real adjustments”* (in the Mali report)

- Improvements in the previous sections should make it easier to define adjustments in project activities. Until now test participants had some difficulties following the rationality in this step requiring more support from the climate expert conducting the test.
- Some participant of the test in Tanzania as well as in the exercises made in India and Ecuador found some difficulties in proposing adjustments in the projects at the level of specific indicators. Until this step the tool has been used to screen linkages and relationships between climate variability, livelihoods and the project. These linkages are kept in the first three sections at an analytical, qualitative level. However, in the fourth step, “adjusting project activities”, project managers are asked to propose clear indicators. Some participants had the feeling that at this step there is not enough information to jump into quantitative proposals.

### **Comments on testing modalities**

- **Participatory testing process is time-consuming, but very informative** – especially for the project managers who may think they already knew all of the information needed to use the tool! This has been confirmed in the testing in Tanzania.
- During the test in Tanzania, as well as in the exercises in Ecuador and India, participants expressed the need to develop guidelines for using the tool with the community.
- For sessions with community members, users of the tool should try to differentiate between short, medium and eventually long term coping strategies
- **Participatory process for testing or applying the tool is an effective climate change awareness-raising strategy.** In Tanzania, as well as in Mali, participants were interested to learn about the scientific explanation behind climate change, as it corroborated their own personal observations of change
- **Many project managers / staff lack basic understanding on climate change.** *“Yet the effective application of this tool requires a basic understanding of climate change and its impacts. The tool must therefore be accompanied by teaching materials and resources on climate change. In the Mali test, the involvement of the National Programme Coordinator, who is very knowledgeable about climate change, facilitated the process. If the testing had been left to PAGEIT project staff, the testing process would have been more challenging.”* This statement applies also for Tanzania.
- **The tool provides a useful framework for explaining the links between climate change, livelihoods and a project.** Although the testing process took more than 5 hours, the structure of the tool allowed for a logical progression of the discussion, which enabled participants to identify and understand the links clearly.



- **The tool should call for prioritization of responses.** *In the interest of time and efficiency, users should be asked to list the top 3 hazards, impacts, coping strategies, livelihoods resources etc. Users are welcome to list all the information that come to mind (for the purpose of documenting and archiving information), but the tool application process should only address priorities.* The test in Tanzania was done according to this comment. It proved to be a good approach.

### **Linkages with other SDC ongoing activities**

There are some ongoing SDC financed activities where the use of the tool could be an important synergy. Some concrete activities/projects are:

- a) The use of the tool can support the evaluation of new proposals (e.g. by RLDC)
- b) The tool can be used in the Systematic Analysis of Rural Development (SARD) of the DEZA so that climate variability and its challenges for sustainable development are covered
- c) Within the project on “*Vulnerability and Adaptation in semi-arid areas of India*” the CRYSTAL tool seems to be an alternative for assessing vulnerability and selecting adequate coping strategies.

### **Future developments/challenges in assessing vulnerability to climate variability/change at the livelihood level**

- The tool is developed according to the first step in the Environmental Impact Assessment (EIA), screening. The following steps in this approach are scoping and assessment. Therefore a next step in developing a toolkit for assessing vulnerability to climate variability will be to define the scope for using the tools/the need for adjustment according to different areas of use. Further, some general guidelines on C&I to be considered when assessing vulnerability at the livelihood level could be elaborated. Future developments of the toolkit should consider these elements.
- By using the CRYSTAL tool project managers and communities identify coping strategies used in the area. Developing a method for looking at the sustainability of these coping strategies would be relevant for many projects. The strategy of producing charcoal in Tanzania is a good example of the challenges that project managers can face when trying to prepare for adaptation. On one side, producing charcoal is definitively an alternative for the community in terms of getting income during extreme events when crops production is severely reduced. On the other side, production practices as well as an uncontrolled demand can promote degradation of the secondary forest beyond the possibility of natural regeneration. Additionally, the Government of Tanzania set a ban for charcoal production in/from forest areas. The challenge here would be to define under which conditions charcoal production would be sustainable even considering the increasing drought risk. Project managers should have a tool that allow them easily and systematically analyzing circumstances where a coping strategy represents an alternative for the community without forgetting screening its sustainability.

ANNEX 1: MAP OF DODOMA



ANNEX 2: TOOL TESTING TRIP AGENDA (SEPTEMBER 11 – 16, 2005)

<b>Day</b>	<b>Activity</b>	<b>Participants</b>
Friday 17th	CR arrives in the evening in Dar (Flight from Swiss)	
Saturday 18th or Sunday 19th	CR from Dar to Dodoma	
Monday 20th	Presentation of the RLDC Introduction on climate change and natural resource management Preparation of the field visit	CR Felix Bachmann Stellah Rwiza Federico di Philippi Japhet Chamgeni Annet Witteveen
Tuesday 21st	Field visits to - Makoya - Chingali 2	CR Felix Bachmann Stellah Rwiza Japhet Chamgeni Representatives of the communities of: - Makoya (25) - Chingali 2 (19) - Manchali (
Wednesday 22nd	Field visit to - Manchali Initiation of the application of the CRYSTAL tool	CR Felix Bachmann Stellah Rwiza Federico di Philippi Japhet Chamgeni
Thursday 23rd	Finalisation of the application of the CRYSTAL tool Meeting with the team of the project on eco-charcoal Future activities on Climate Change in Tanzania	CR Felix Bachmann Stellah Rwiza Federico di Philippi Katharina Haerberli
Friday 24th	CR: Trip back to Dar and flight back	