

Risk Management Framework - the big LEAP* in Ethiopia and:

Insurance in Catastrophe Risk Management

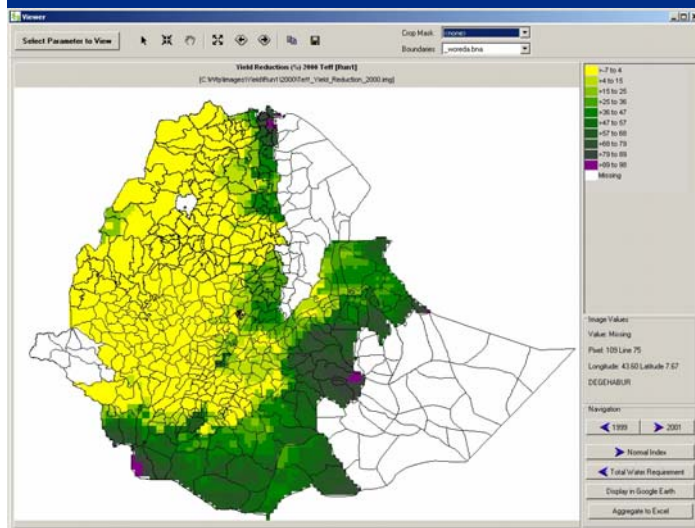
November 14, 2007

Bündnis Entwicklung Hilft

Nachhaltige Entwicklung als Katastrophenvorsorge

Gustav-Stresemann Institut, Bonn

Ulrich Hess, Chief of Business Risk Planning, WFP



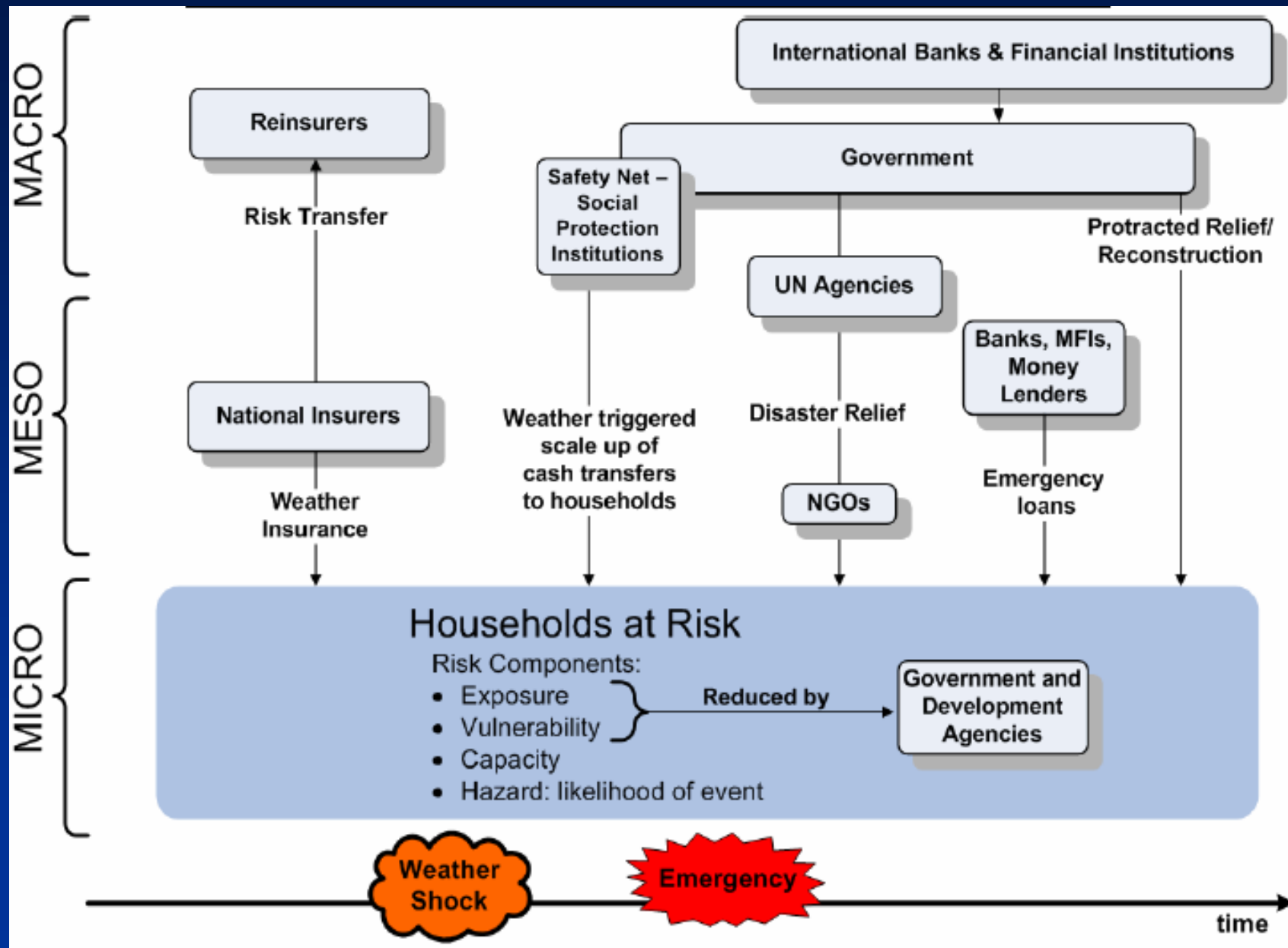
**Livelihoods + Early
Assessment + Protection*



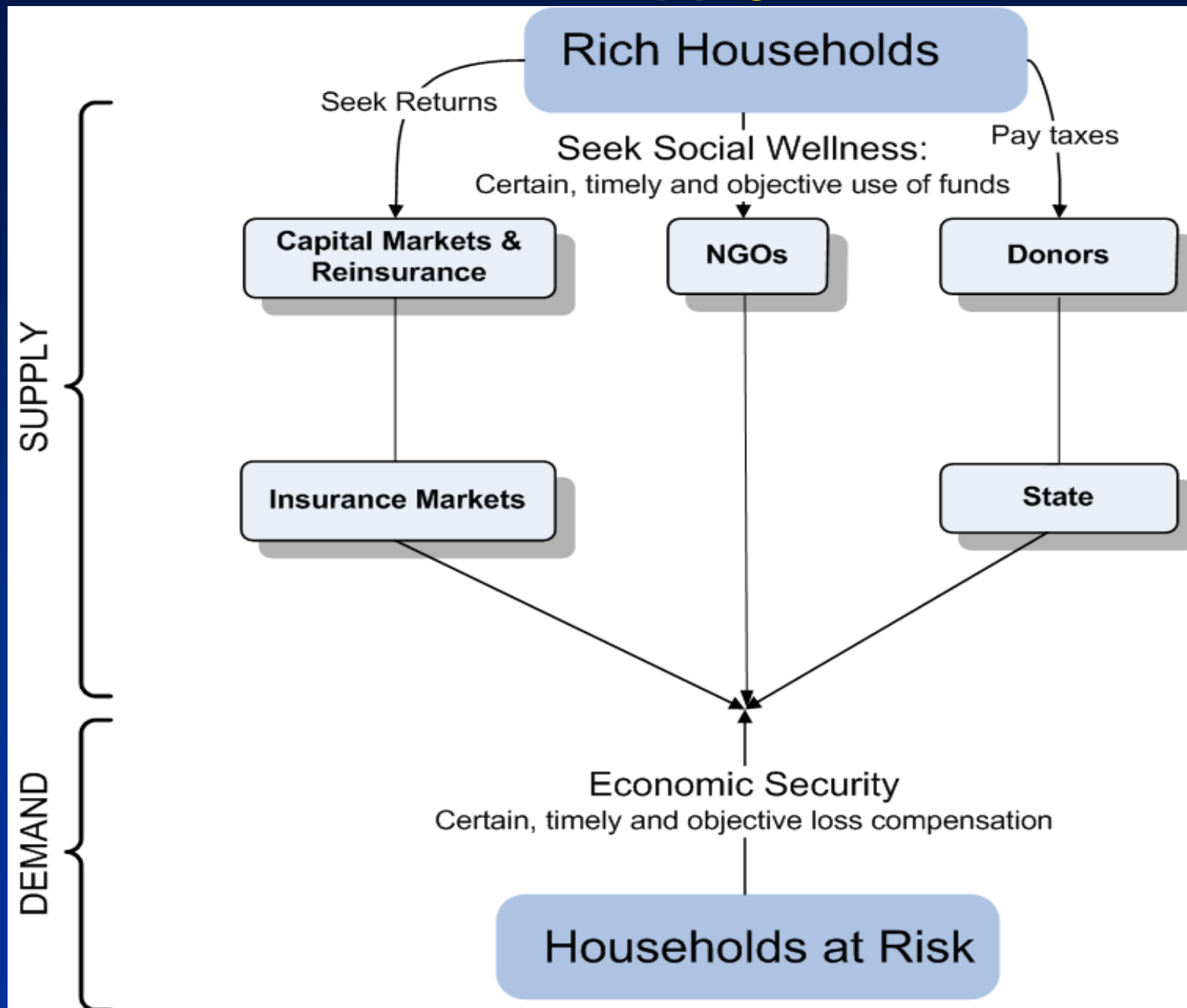
AGENDA

- Context: Disaster Risk Universe
- Problem and Rationale: Managing Risk instead of Managing Disasters
- Ethiopia Phase I: Weather Risk Management Pilot
- Ethiopia Phase II: Risk Management Framework
 - I. LEAP: Livelihood stress Early Warning + Index
 - II. Contingency planning
 - III. Capacity building
 - IV. Risk Financing
- Conclusion: Bündnis Catastrophe Bond

CONTEXT (I): Disaster Risk Universe



Context (II): Demand & Supply for Risk Transfer



Context (III): People want Security - India Weather Insurance Survey

Why did households buy?

	Frequency by reason no.			average
	1st	2nd	3rd	
Security/risk reduction	139	53	20	40.1%
Need harvest income	25	62	12	15.6%
Advice from progressive farmers	17	28	12	8.8%
High payout	9	27	11	6.8%
Other trusted farmers purchased	16	11	16	6.3%
Low premium	17	10	6	5.7%

Why did households not buy?

	Frequency by reason no.			average
	1st	2nd	3rd	
Do not understand product	45	59	11	24.9%
No cash / credit to pay premium	58	21	11	21.4%
Rain gauge too far away	38	39	9	19.0%
Too expensive	32	23	7	14.1%
No castor, groundnut	13	6	1	4.9%

Research Design:

2004: Household survey of 1052 households in selected villages.

2005: "Mini-survey", follow-up of the same households from 2004.

2006: Direct randomized marketing of insurance to households and follow-up surveys.

(Prof. Townsend-Gine-ICRISAT)

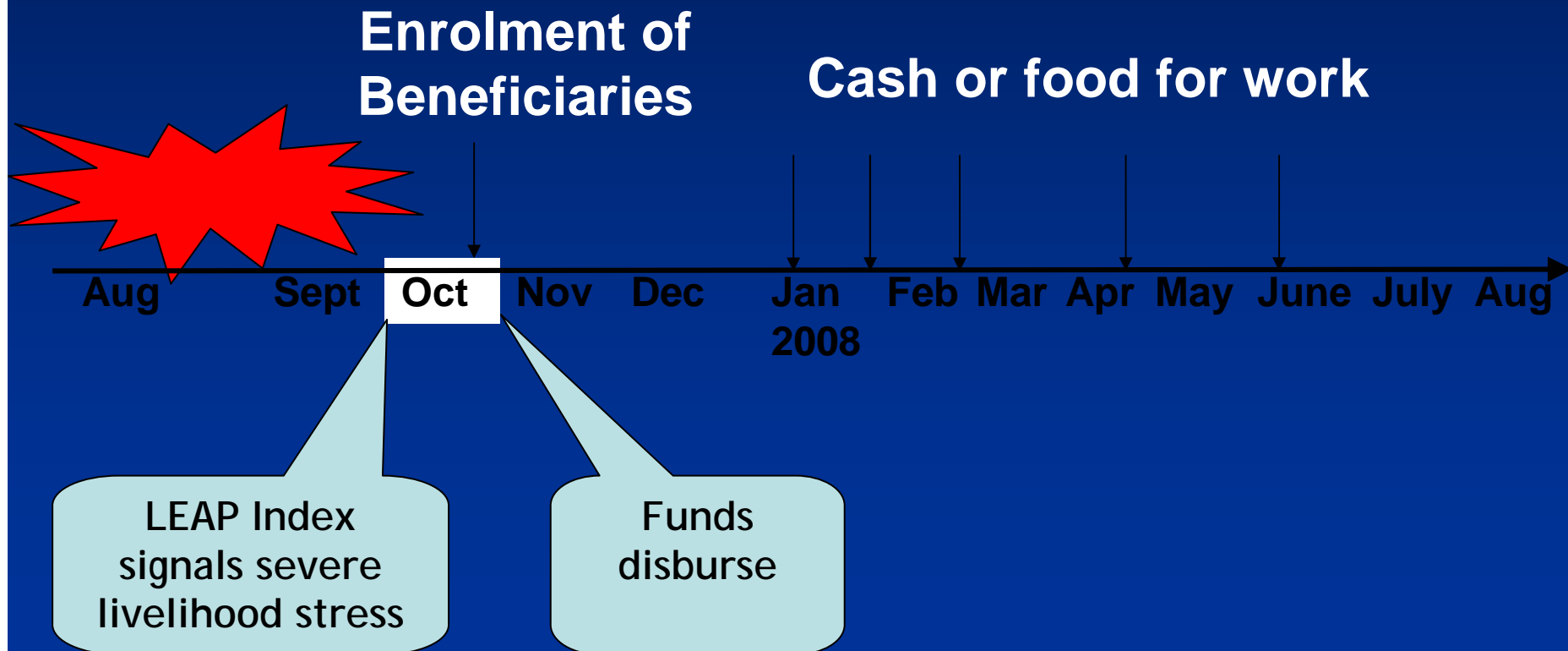
PROBLEM: TIMING and NATURE OF INTERVENTIONS

E.g. Safety Net Areas - Highlands



RATIONALE (I): EFFECTIVENESS - PROTECT LIVELIHOODS IN TIME

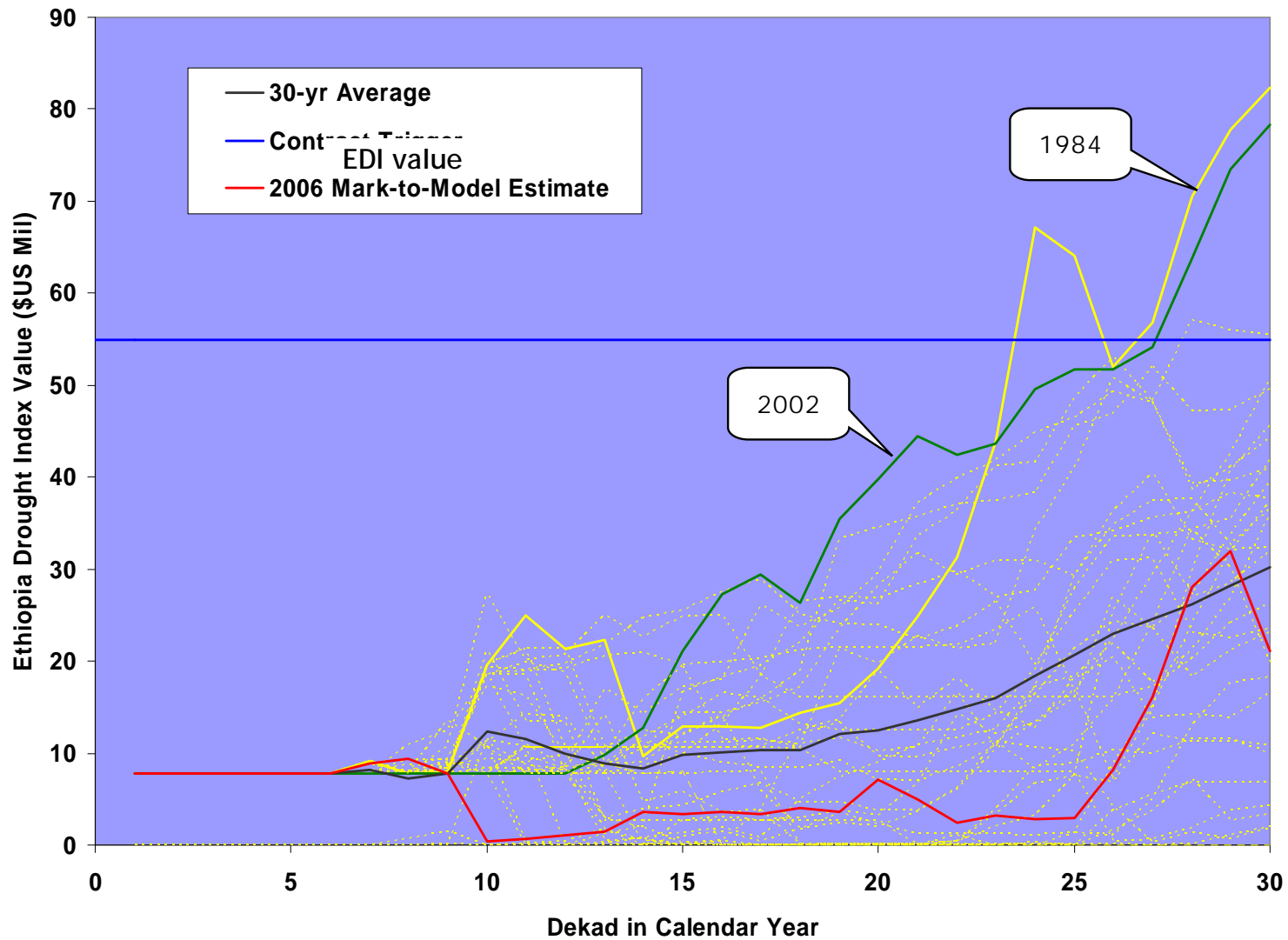
Example: Tigray, Ethiopia



RATIONALE (II) EFFICIENCY - PROTECTING LIVELIHOODS IS CHEAPER

- Cost benefit analysis reveals that for drought risk systematic livelihood protection is 6 times cheaper than ex-post emergency interventions

REVIEW OF 2006 PILOT DROUGHT INDEX PERFORMANCE



THE 2006 ETHIOPIA TRANSACTION

- Risk Transfer Structure:
 - Counterparty (buyer of option): UN World Food Programme
- Competitive Tender Process:
 - Official UN WFP procurement process
 - 9 companies invited to tender, 5 participated
 - Tender Winner (seller of option): AXA Re, Paris
 - Final Transaction:
 - Premium: \$930,000, paid by USAID mainly
 - Maximum Payout: \$7,100,000

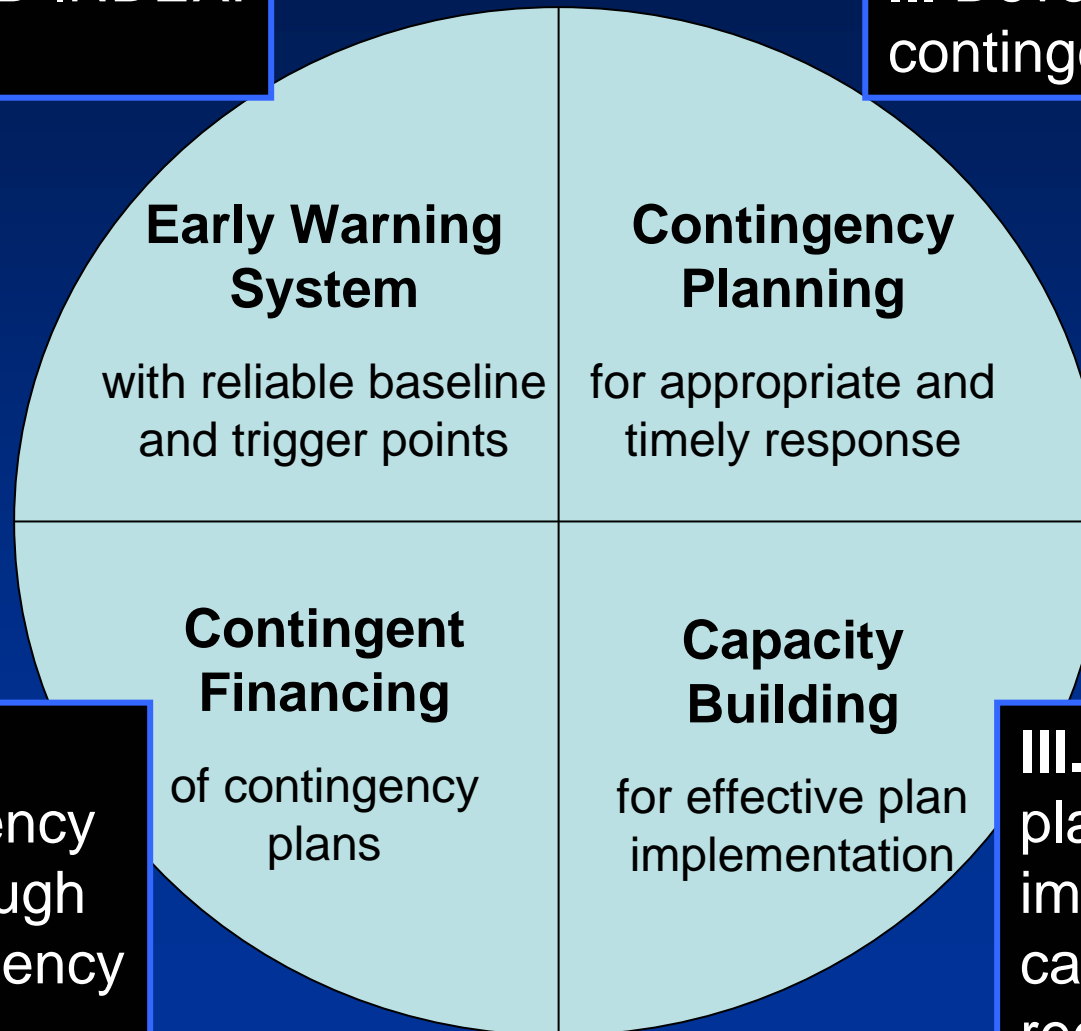
LESSONS LEARNED

- Project demonstrated
 - Weather risk of developing countries can be transferred using market mechanisms;
 - It is possible to develop objective, timely and reliable indicators that serve as proxy of actual aggregate needs
 - Ethiopia weather data can satisfy international weather risk market standards

ETHIOPIA PHASE II - RISK MANAGEMENT FRAMEWORK

**I. IMPROVED INDEX:
LEAP**

**II. Develop budgeted
contingency plans**

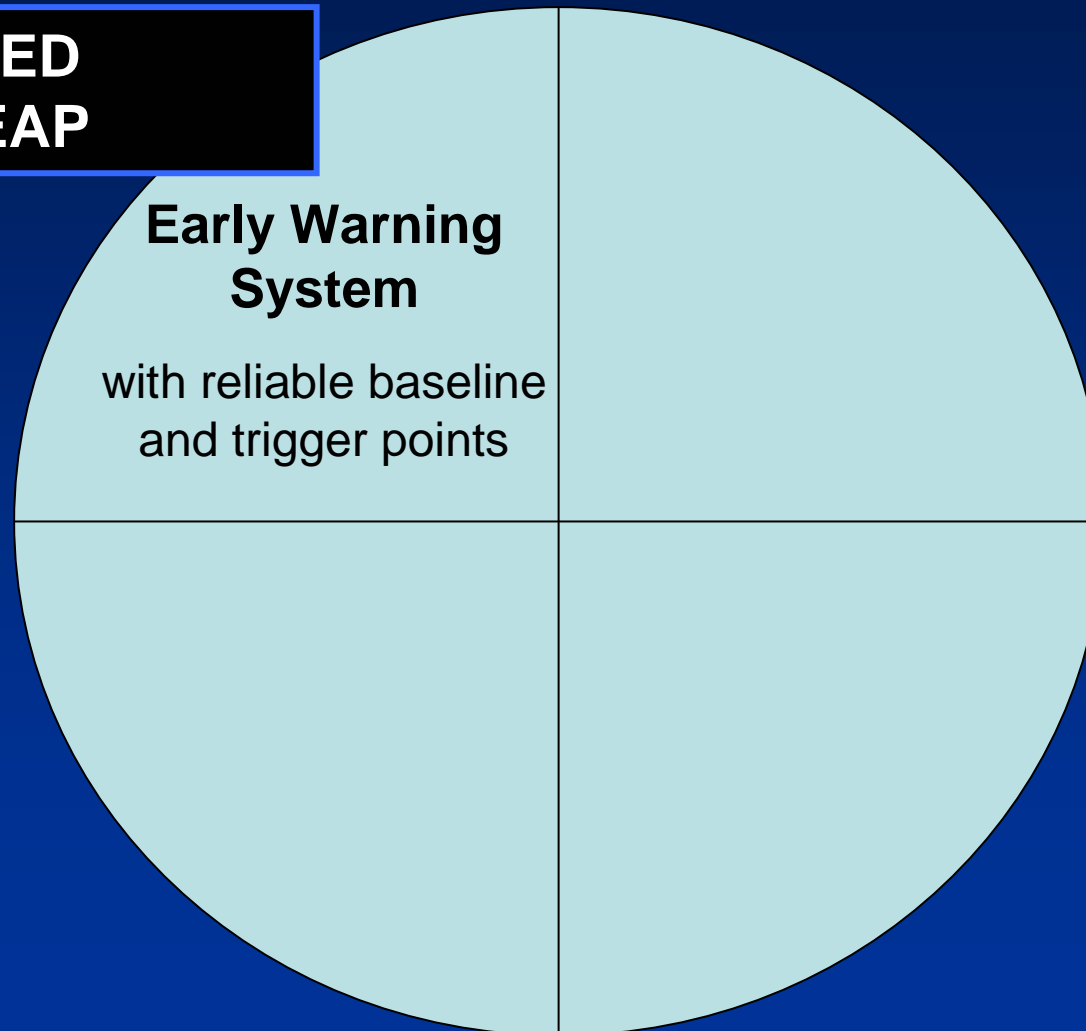


**IV. Establish
timely emergency
financing through
use of contingency
financing**

**III. Build
planning and
implementation
capacity at
regional level**

IMPROVED INDEX - PART OF RISK MANAGEMENT FRAMEWORK

I. IMPROVED INDEX: LEAP



WHAT DO WE WANT FROM LIVELIHOOD PROTECTION COST INDEX?

- Represent cost of intervening early to protect vulnerable livelihoods
- Signal amount of financial resources needed for regions to protect vulnerable livelihoods before harvest
- Trusted by GoE and donors to trigger timely resources
- Provide early warning of livelihood stress levels
- Crop and pasture monitoring tool
- Easily customizable according to new purposes
- Open source and available for free

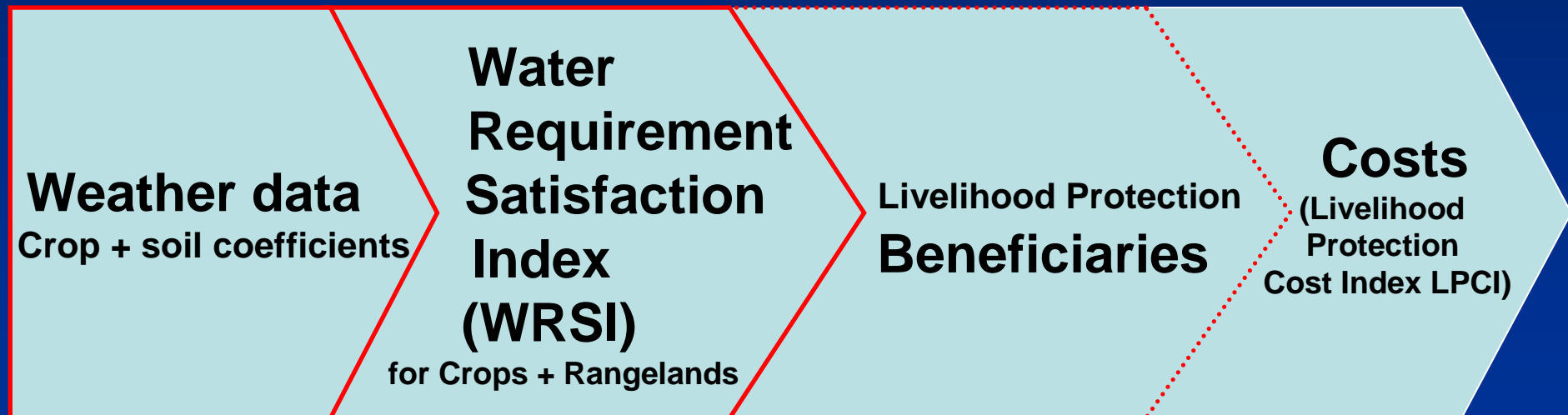
LEAP INDICES

- Objective: capture livelihood protection funding needs at regional level
- Target group: vulnerable population

RS 1: Rainfall
Estimates

RS 2: Planted Areas
RS 3: Crop Emergence

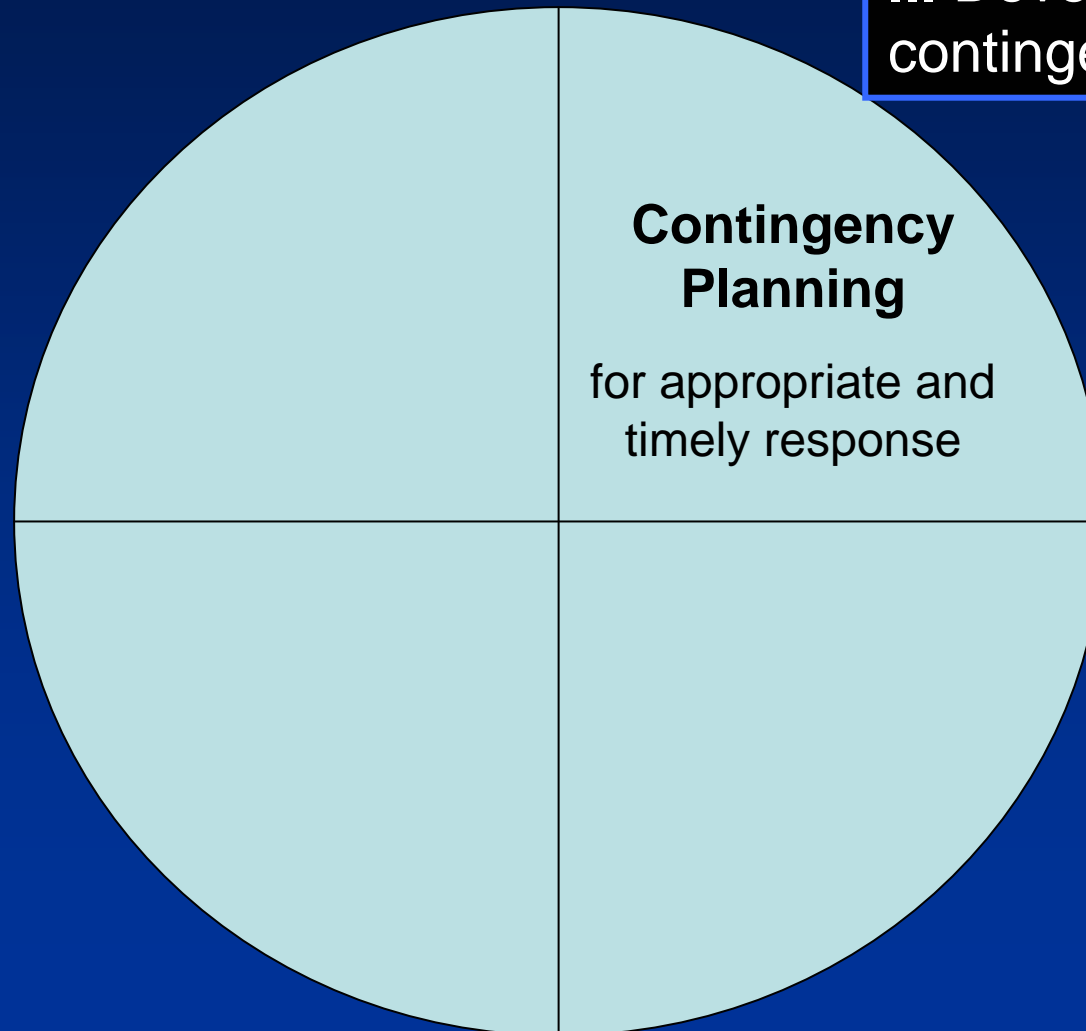
RS 4: WRSI in
Google Earth



- Yield reduction in %
- “Hot spot” monitoring

RISK MANAGEMENT FRAMEWORK

II. Develop budgeted contingency plans

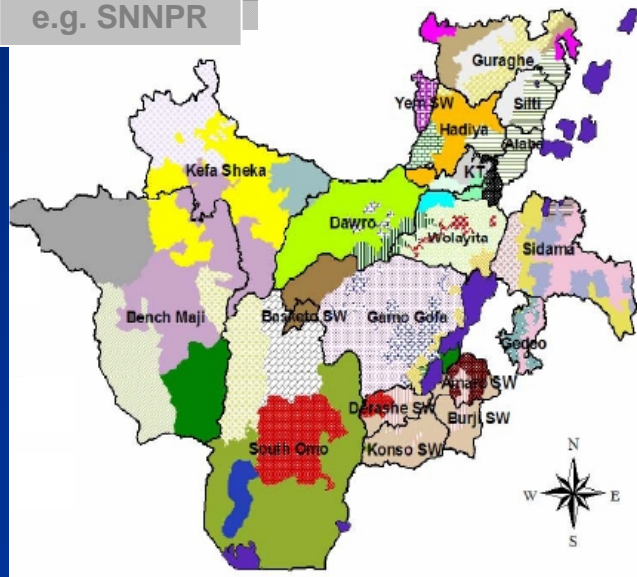


II. CONTINGENCY PLANNING IN CONTEXT

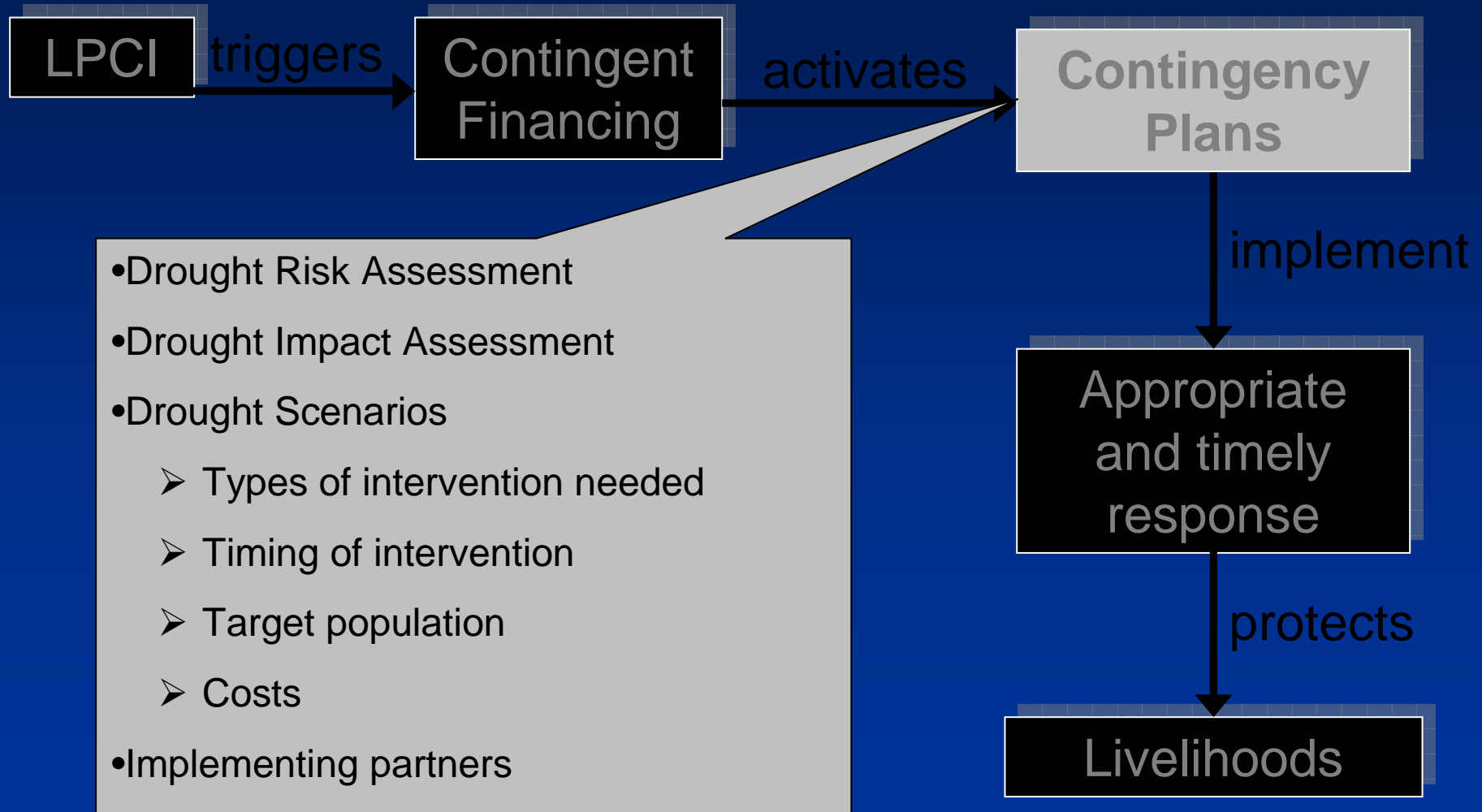
Contingency Plans

Livelihood Analysis

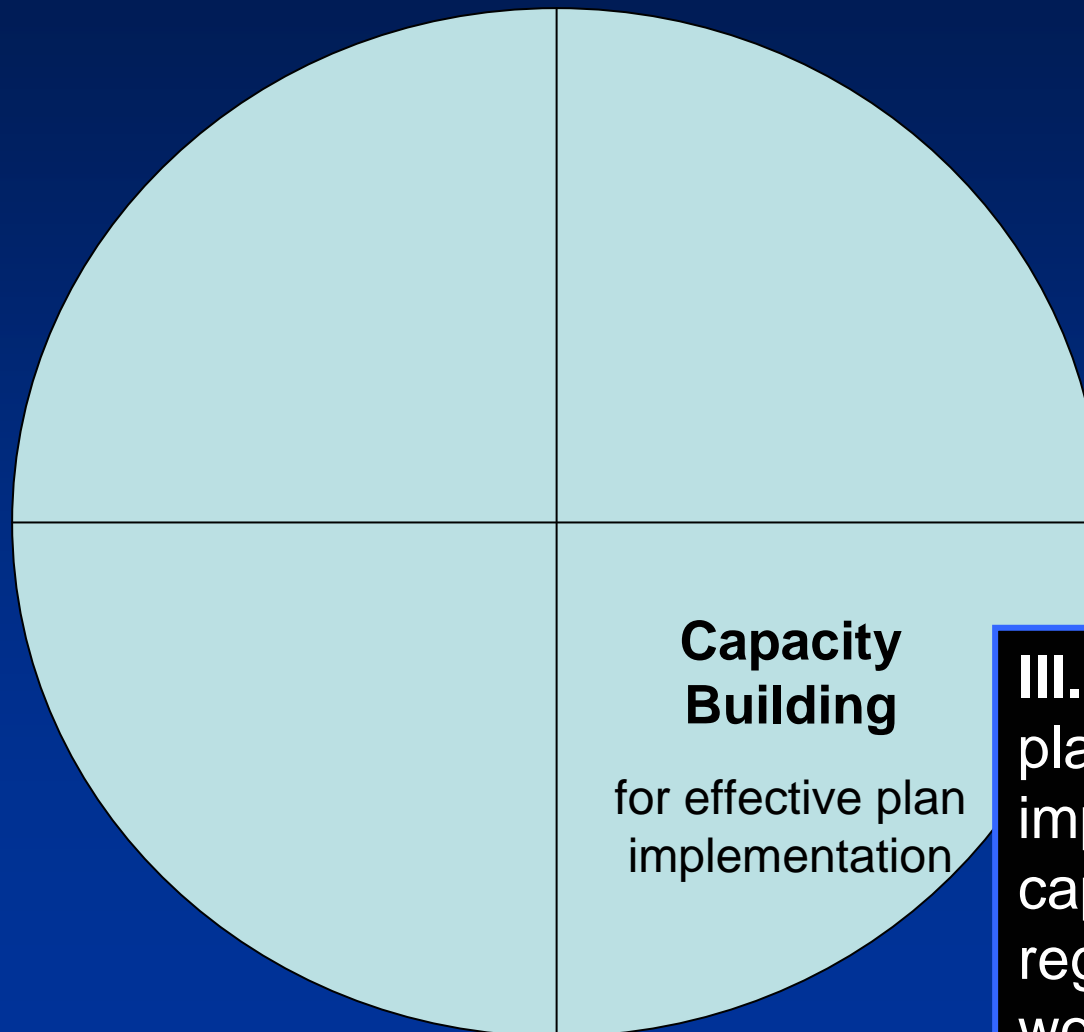
e.g. SNNPR



II. CONTINGENCY PLANNING IN CONTEXT



RISK MANAGEMENT FRAMEWORK

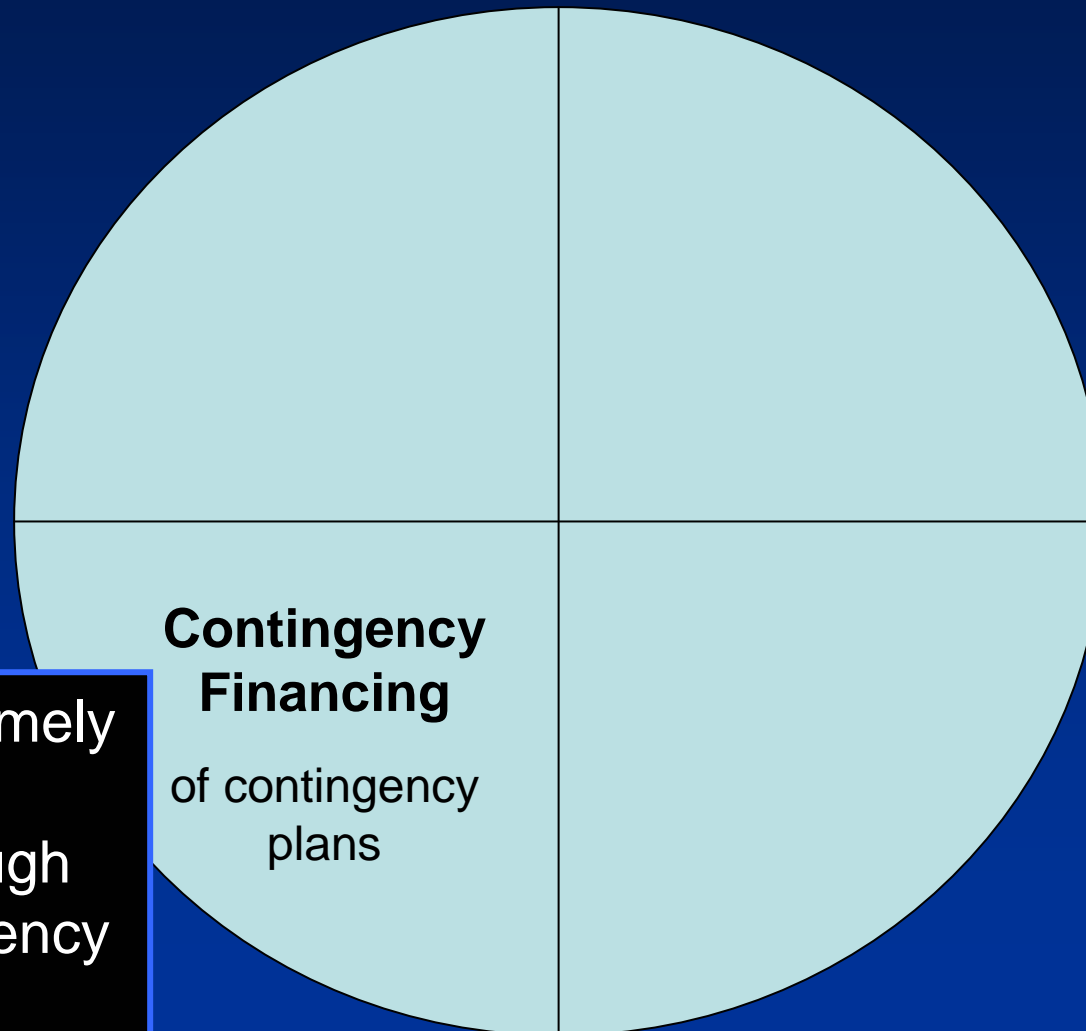


III. Build
planning and
implementation
capacity at
regional and
woreda level

III. CAPACITY BUILDING + OWNERSHIP

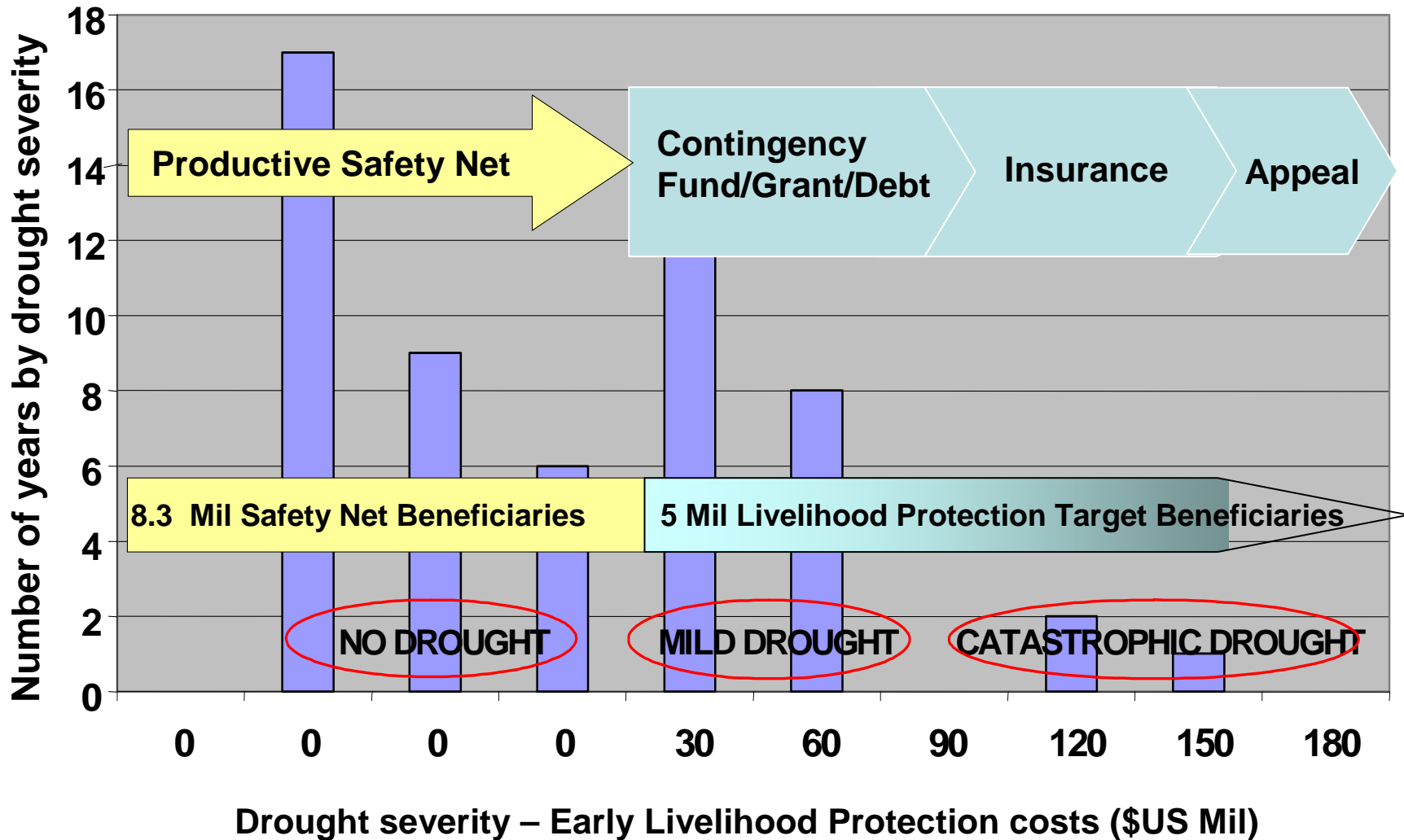
- Planning
 - Elaboration and updating of contingency plans
- Implementation
 - Through state and non-state actors
 - Co-ordination of line ministries
 - Supervision and Quality control
- Partners
 - DFID
 - WB

RISK MANAGEMENT FRAMEWORK



IV. Establish timely emergency financing through use of contingency financing

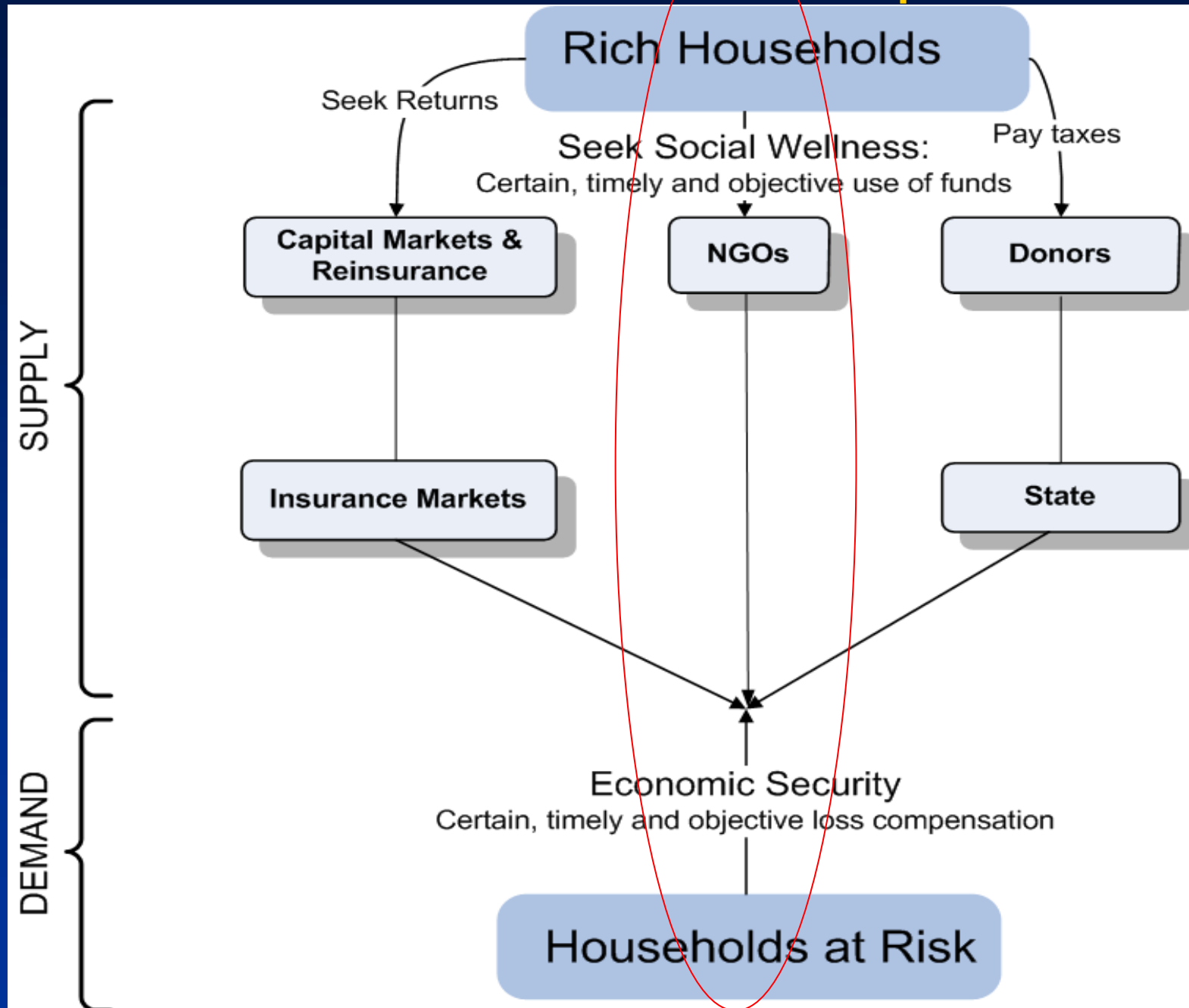
IV: INTEGRATED CONTINGENCY FINANCING



WHY IS THIS IMPORTANT

1. Destitution
2. Dignity
3. Cost
4. Climate Change

Conclusion: Bündnis Catastrophe Bond



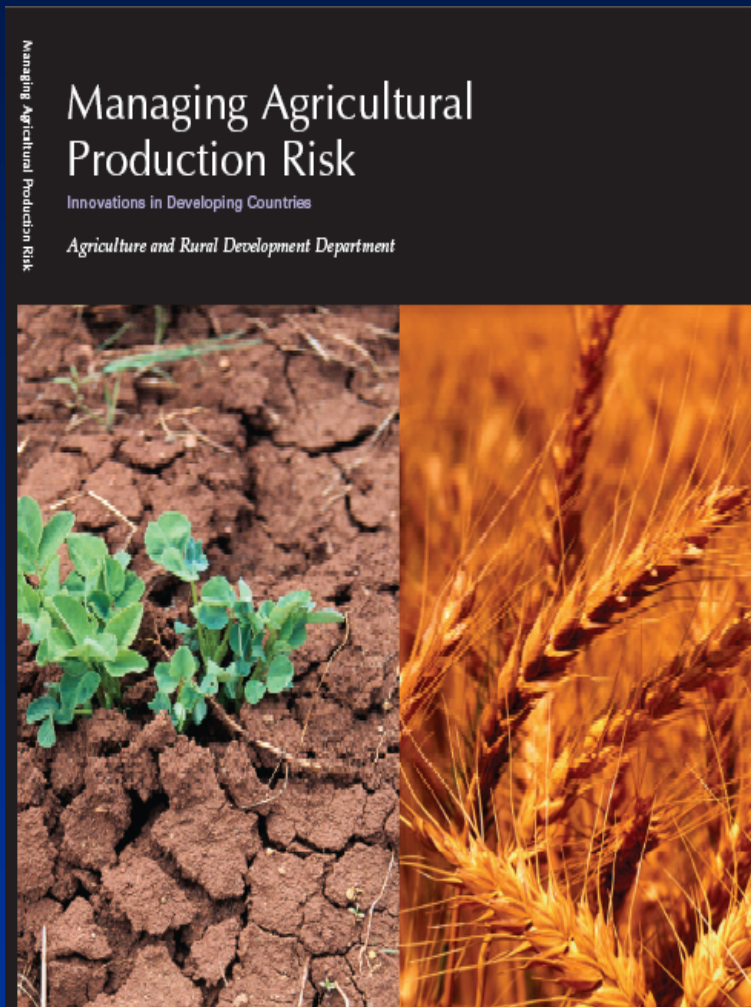
Bündnis Catastrophe Bond (II)

- Bündnis issues Natural catastrophe indexed bond to social investors
- Investors earn interest if nothing happens
- Investor loses principal if pre-defined event happens
 - Money pays for livelihood protection by activating Bündnis contingency plans and/or
 - Bündnis members transfer money directly to beneficiaries

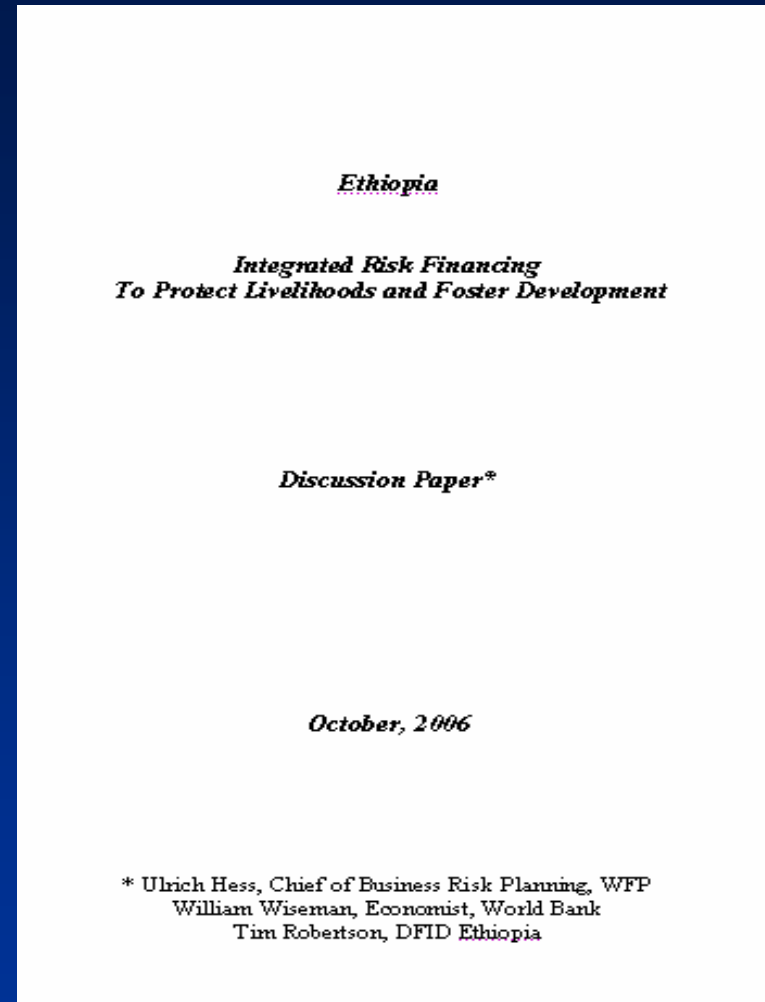
Bündnis Catastrophe Bond (III)

- Benefits for investor
 - Certain, timely and objective use of funds
- Benefits for households
 - Certain, timely and objective compensation and/or livelihood support
 - Economic Security
 - Access to credit
 - Innovation – technological leap
 - Out of poverty trap
- Risk: Index and payouts do not match actual needs

REFERENCES



<http://www.ruralfinance.org>



<http://www.wfp.org/policies/introduction/background>

THANKS!

- Ethiopia LEAP Tool download:

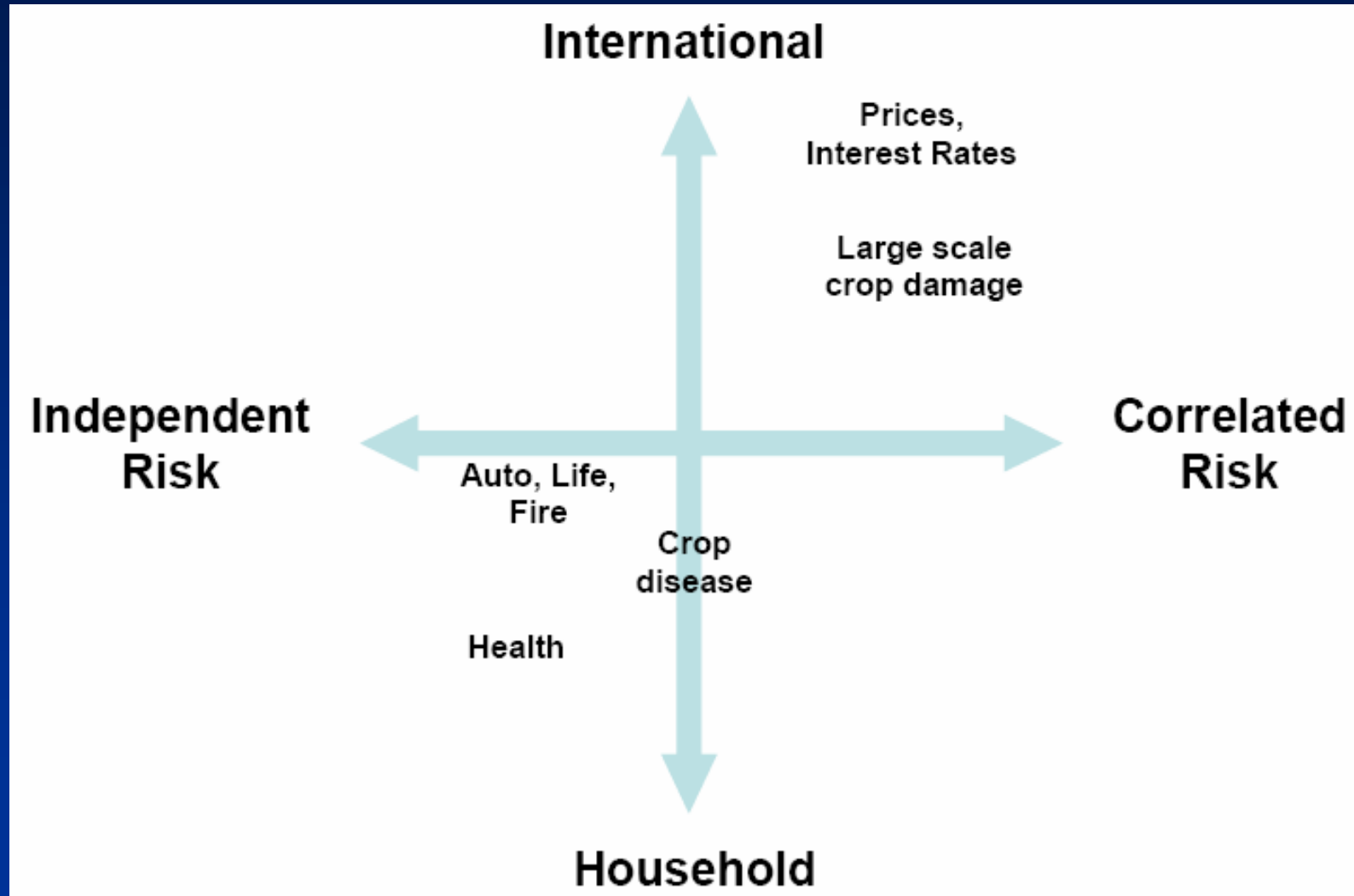
<http://vam.wfp.org/LEAP>

Free software download. Please do not distribute without consent of WFP and World Bank

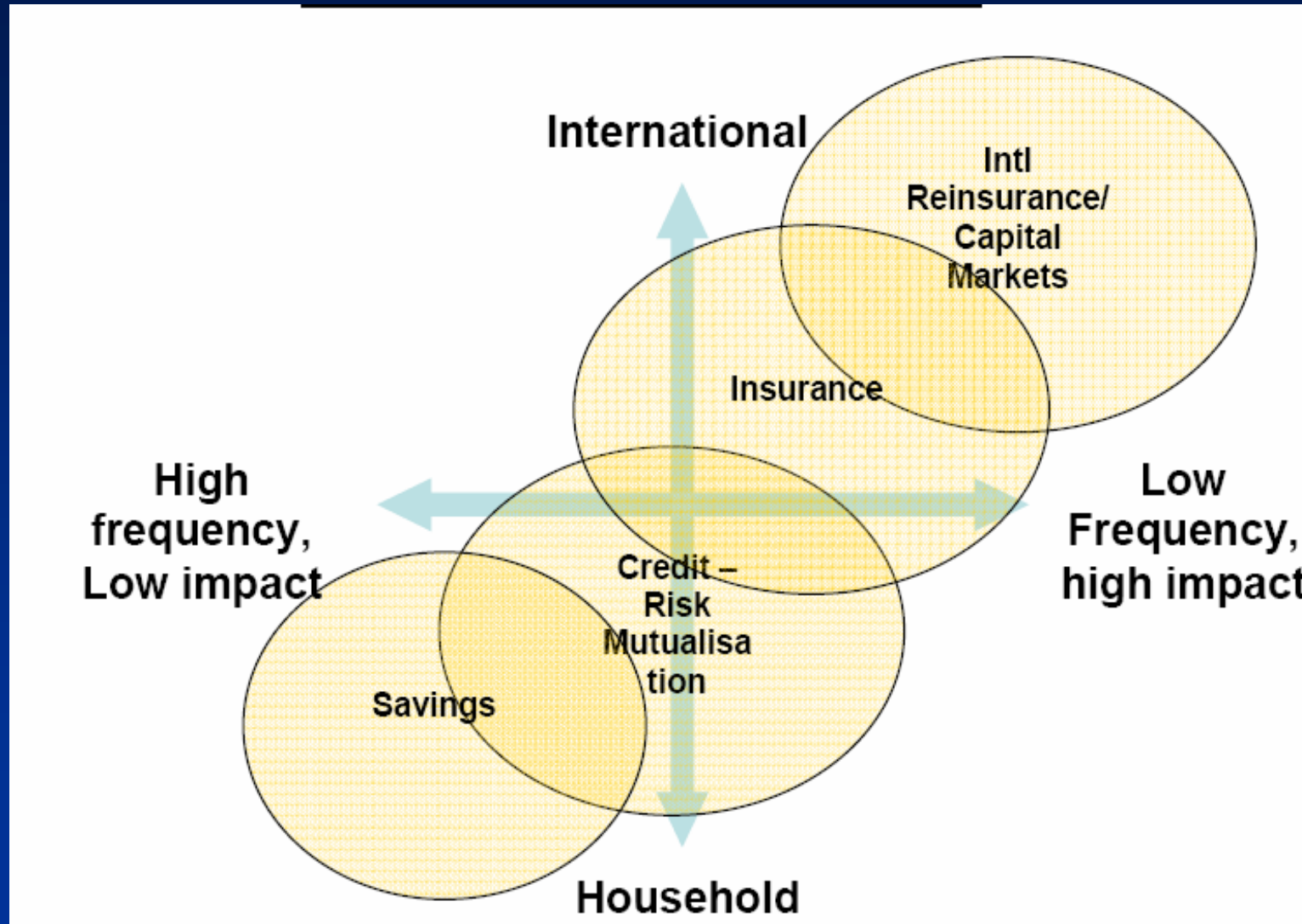
- For questions: ulrich.hess@wfp.org

BACK UP SLIDES

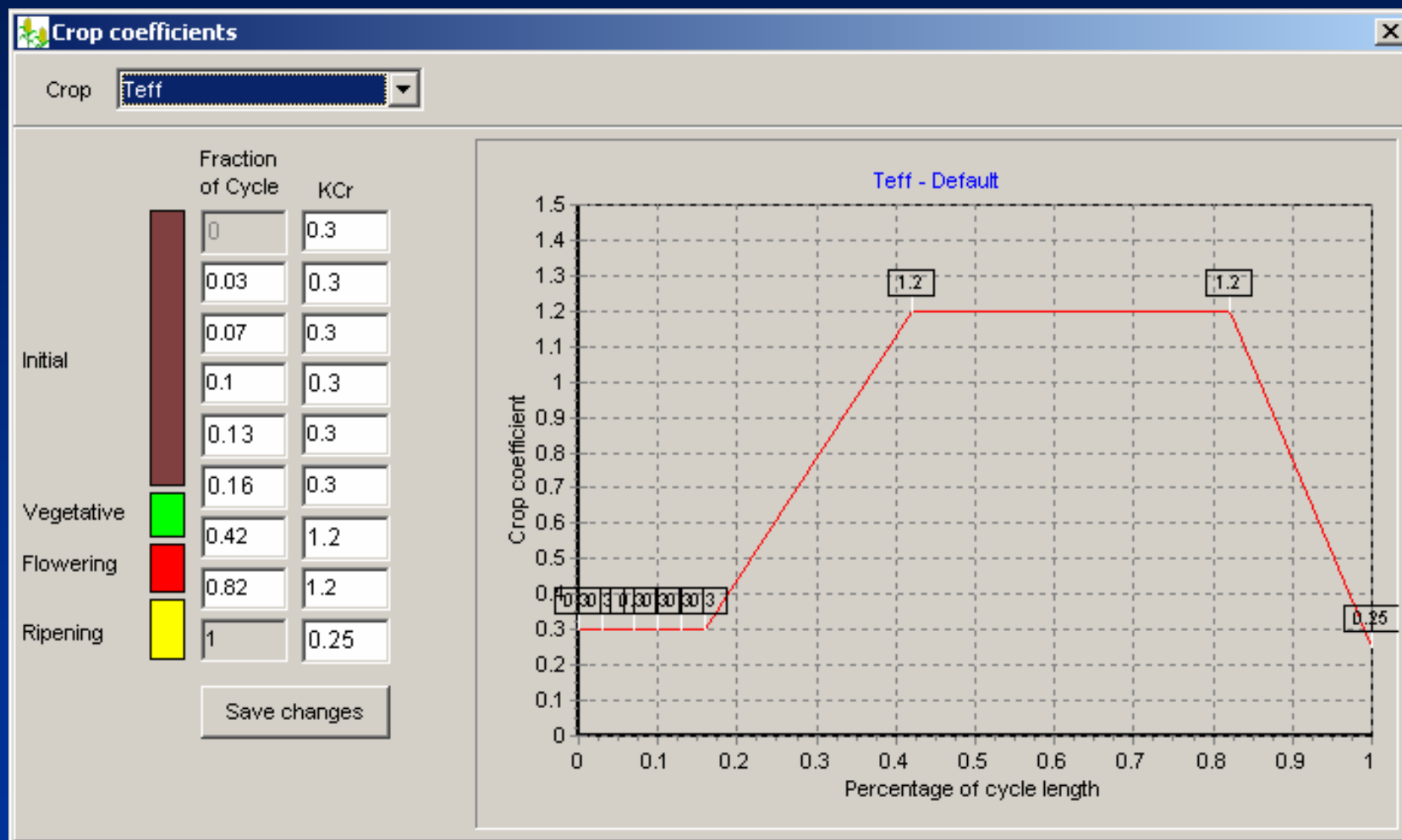
NATURE OF RISK



WHERE AND HOW TO SHARE RISK



LEAP Software: Defining crops and model for crop water use



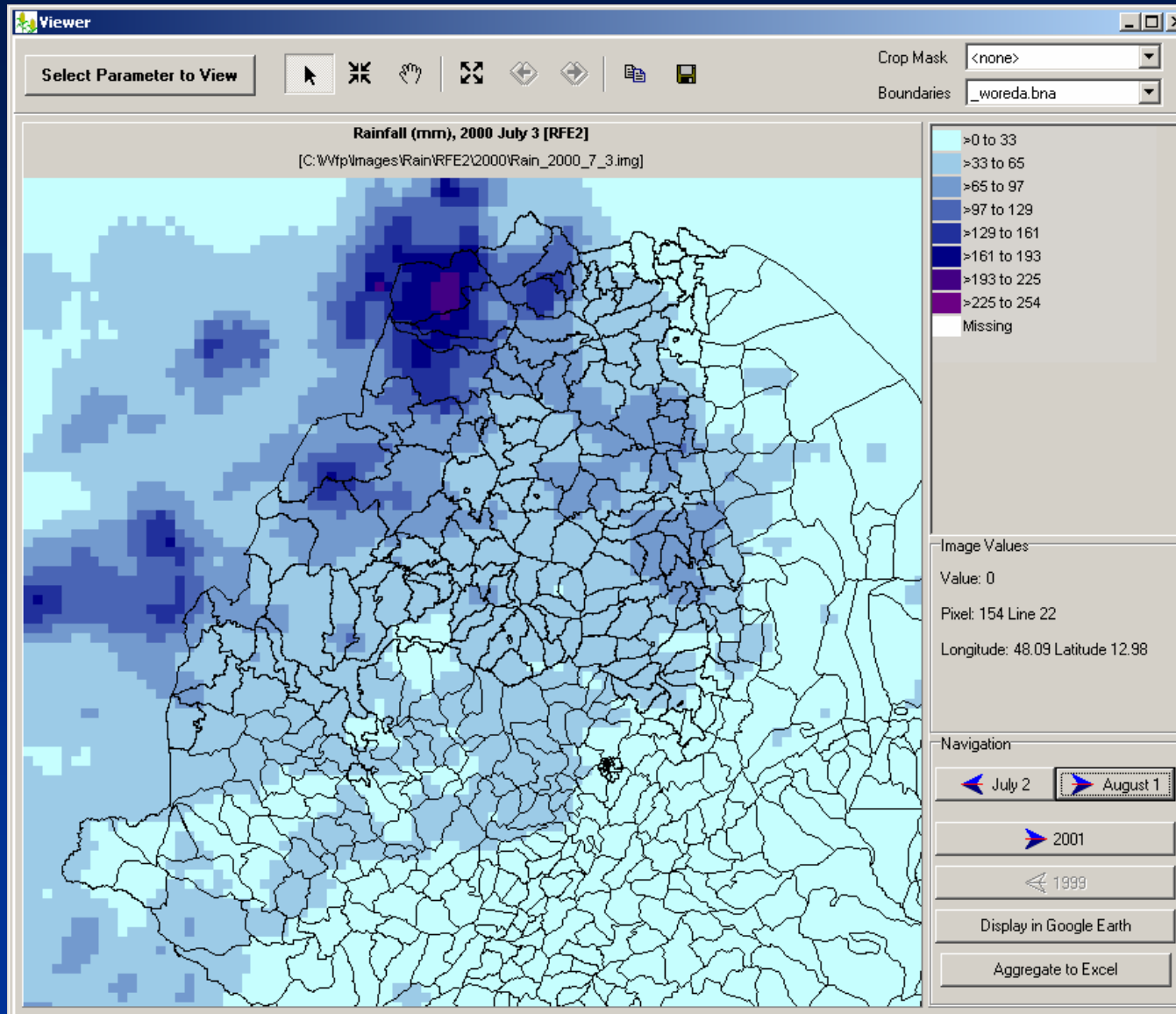
Download updated rainfall data from the internet from 5 different sources (example RFE2)



The screenshot shows a Windows Internet Explorer browser window displaying an FTP directory listing. The address bar shows the URL `ftp://ftp.cpc.ncep.noaa.gov/fews/newalg`. The page title is "FTP directory /fews/newalگو_est_dekad/ at ftp.cpc.ncep.noaa.gov". Below the title, there is a message: "To view this FTP site in Windows Explorer, click Page, and then click Open FTP Site in Windows Explorer." A link "Up to higher level directory" is provided. The main content is a list of files with their sizes and names, all dated 02/12/2002 12:00AM. The files are 10-day precipitation data in gzipped binary format.

Date/Time	Size	Filename
02/12/2002 12:00AM	1,069,370	10day_precip.bin.1999121.gz
02/12/2002 12:00AM	1,081,613	10day_precip.bin.1999122.gz
02/12/2002 12:00AM	1,041,563	10day_precip.bin.1999123.gz
02/12/2002 12:00AM	933,728	10day_precip.bin.2000031.gz
02/12/2002 12:00AM	1,124,350	10day_precip.bin.2000032.gz
02/12/2002 12:00AM	1,270,165	10day_precip.bin.2000033.gz
02/12/2002 12:00AM	1,256,252	10day_precip.bin.2000041.gz
02/12/2002 12:00AM	1,253,256	10day_precip.bin.2000042.gz
02/12/2002 12:00AM	1,164,244	10day_precip.bin.2000043.gz
02/12/2002 12:00AM	1,240,112	10day_precip.bin.2000051.gz
02/12/2002 12:00AM	1,121,415	10day_precip.bin.2000052.gz
02/12/2002 12:00AM	1,030,264	10day_precip.bin.2000053.gz
02/12/2002 12:00AM	990,805	10day_precip.bin.2000061.gz
02/12/2002 12:00AM	780,292	10day_precip.bin.2000062.gz
02/12/2002 12:00AM	792,671	10day_precip.bin.2000063.gz
02/12/2002 12:00AM	762,034	10day_precip.bin.2000071.gz
02/12/2002 12:00AM	789,481	10day_precip.bin.2000072.gz
02/12/2002 12:00AM	910,618	10day_precip.bin.2000073.gz
02/12/2002 12:00AM	834,251	10day_precip.bin.2000081.gz
02/12/2002 12:00AM	815,795	10day_precip.bin.2000082.gz
02/12/2002 12:00AM	783,326	10day_precip.bin.2000083.gz
02/12/2002 12:00AM	881,265	10day_precip.bin.2000091.gz

Integrate this rainfall into the tool



Water balance calculations resulting in WRSI



Selecting output (or input) parameter to view

Parameter selection

Parameters

Output Run1

Percentage Available Data

Total Water Requirement

Final Index

Normal Index

Last Index based on Actual Data

Water Excess Initial Phase

Water Excess Vegetative Phase

Water Excess Flowering Phase

Water Excess Ripening Phase

Water Deficit Initial Phase

Water Deficit Vegetative Phase

Water Deficit Flowering Phase

Water Deficit Ripening Phase

Actual Evapotranspiration Initial Phase

Actual Evapotranspiration Vegetative Phase

Actual Evapotranspiration Flowering Phase

Actual Evapotranspiration Ripening Phase

Total Water Excess

Total Water Deficit

Total Actual Evapotranspiration

Yield Reduction

Basket

Basket Final Index by Production

Basket Final Index by Area

Basket Yield Reduction by Production

Basket Yield Reduction by Area

Input Zonal

Rainfall

ETO

Effective Rainfall Percentage

Pre-Planting Crop Coefficients

Water Holding Capacity

Cycle Length

Planting Dekad

Sowing Window Start Dekad

Sowing Window End Dekad

Crop Basket Ave Production

Crop Basket Ave

Crop Basket Max Hist. Yield

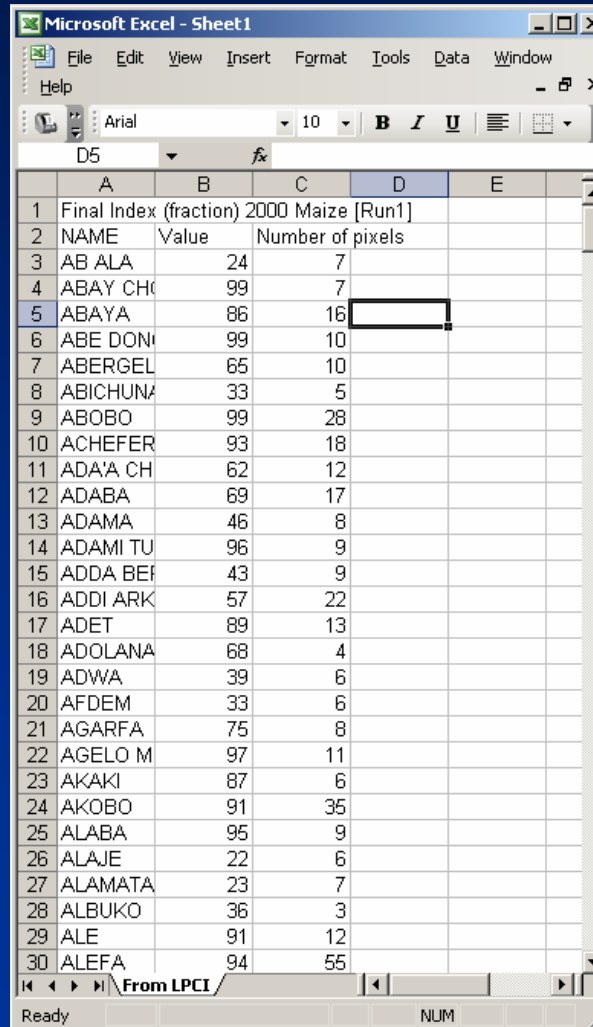
Crop Basket % by Production

Crop Basket % by Area

Year 2000 **Month** May **Dekad** 2

Crop Maize

Export all map data to Excel



Microsoft Excel - Sheet1

File Edit View Insert Format Tools Data Window Help

Arial 10 B I U

D5

	A	B	C	D	E
1	Final Index (fraction) 2000 Maize [Run1]				
2	NAME	Value	Number of pixels		
3	AB ALA	24	7		
4	ABAY CHO	99	7		
5	ABAYA	86	16		
6	ABE DONI	99	10		
7	ABERGEL	65	10		
8	ABICHUNA	33	5		
9	ABOBO	99	28		
10	ACHEFER	93	18		
11	ADA'A CH	62	12		
12	ADABA	69	17		
13	ADAMA	46	8		
14	ADAMI TU	96	9		
15	ADDA BEF	43	9		
16	ADDI ARK	57	22		
17	ADET	89	13		
18	ADOLANA	68	4		
19	ADWA	39	6		
20	AFDEM	33	6		
21	AGARFA	75	8		
22	AGELO M	97	11		
23	AKAKI	87	6		
24	AKOBO	91	35		
25	ALABA	95	9		
26	ALAJE	22	6		
27	ALAMATA	23	7		
28	ALBUKO	36	3		
29	ALE	91	12		
30	ALEFA	94	55		

From LPCI NUM

Ready

Work with crop baskets

Microsoft Excel - Zonal Cropping Data Name Change Edited

Region	Zone	Code	Teff	Barley	Wheat	Maize	Sorghum	Finger Millet	Chick Peas	Field Pea	Haricot Bean	Horse Bean	Lentils	Potato
TIGRAY	C. Tigray		50.97061	15.35046	14.25771	16.02252	37.52358	13.73651	2.226574286	0.6051288	0.940958571	6.0976175	1.088091	0.0106
TIGRAY	W. Tigray		34.48772	1.09394	4.879148	26.15096	59.82709	40.62748286	3.46101375	0.37927	0.146645	2.07649	0.012617	0.0035
TIGRAY	E. Tigray		7.68856	23.06494	17.44227	3.598963	2.651589	2.5168475	2.26919375	1.288705	0.00492	1.953334286	0.682305	0.1395
TIGRAY	NW Tigray		0	0	0	0	0	0	0	0	0	0	0	0
TIGRAY	S. Tigray		40.31099	33.77512	32.77509	10.11574	25.01854	0.885298333	2.79117975	2.5742025	0.731366	4.3559975	2.6602	0.13876
AFAR	Zone 1		1.165	0.156797	0	5.477986	0.051804	0	0	0	0	0	0	0
AFAR	Zone3		3.639535	0.05437	0.05327	1.45591	3.981691	0	0.29527143	0.0025	0.272668	0.0004975	0.001498	0
AMHARA	N. Gondar		101.0524	61.60476	25.98158	37.60054	150.1099	44.49656875	26.96665625	10.266938	3.0942525	23.4814175	2.438534	2.5918
AMHARA	S. Gondar		115.7902	52.59712	36.47528	34.33739	21.60765	33.76539125	19.6640625	10.138293	8.103941667	21.5699475	3.014084	7.5281
AMHARA	N. Wollo		48.15271	26.81192	27.30126	8.151533	36.24766	0.930242857	8.33192	7.1057375	0.89667	10.86820625	7.583321	0.33271
AMHARA	S. Wollo		83.686	31.94233	57.9298	12.78113	60.52487	1.87789	11.20891875	15.547018	5.396345	28.8366225	11.32663	0.21331
AMHARA	N. Shewa		96.77332	52.13297	57.17331	6.326503	55.55015	0.071273333	11.99404643	0.3189969	1.863230769	28.29500333	9.056501	0.0623
AMHARA	E. Gojam		154.1176	45.85342	66.4491	40.19174	22.3369	0.591094	15.44713125	11.510541	0.053946	23.70238875	1.592633	3.22331
AMHARA	W. Gojam		102.2995	25.85997	16.46733	114.5807	9.480398	57.907565	8.5342225	9.75132	3.223232333	18.77691	0.223617	2.1658
AMHARA	W. Harara		20.32422	149.0346	7.741241	1.619038	21.51537	0.329948333	0.7812625	2.4078071	2.05157	6.56134625	2.224253	0.0326
AMHARA	Agew Aadi		51.9137	15.29111	5.34068	36.54171	5.681623	40.854015	0.846076667	2.2929788	1.415735	2.71476875	0	3.44875
AMHARA	Cromiya		9.511043	0.463709	0.1944	8.503283	28.57697	0.21638	0.46222	0.270525	1.119732857	0.23319	0.208048	0.00018
OROMIA	W. Wellega		39.05792	3.802519	10.72061	85.3904	60.09994	38.08104875	1.8269875	2.3717425	9.89154375	7.53526125	0.06753	0.0898
OROMIA	E. Wellega		107.4432	16.68322	22.2217	83.00161	28.80491	19.50099	0.27289	6.64796	1.266318333			
OROMIA	Illubabor		47.10662	2.862818	3.916059	65.99434	24.36919	5.41632	1.03397	4.113265	3.9129375			
OROMIA	Jimma		120.1489	15.19019	25.45535	97.44454	43.62093	5.206922	0.86036	0.4000998	1.588201667			
OROMIA	West Shewa		174.0542	65.25243	82.91268	51.06155	38.48991	0.42805	22.60953667	6.3624814	0.262462			
OROMIA	N. Shewa		96.77332	52.13297	57.17331	6.326503	55.55015	0.071273333	11.99404643	0.3189969	1.863230769			
OROMIA	E. Shewa		101.4094	12.81727	65.05104	116.4357	9.129651	1.546275714	14.03128875	6.3073113	28.0336675			
OROMIA	Arsi		72.23955	103.8576	166.318	68.93779	22.4184	0.26943	0.73739	12.4389	9.107805			
OROMIA	W. Harerge		9.052048	4.491255	3.823546	45.85505	80.95769	0.966026667	0.898016	9.751171429				
OROMIA	E. Harerge		3.478041	4.406893	14.73444	47.11772	0.22499	0.01228	0.228316	2.212775	7.182522857			
OROMIA	Bale		29.8307	70.36493	99.65753	22.03445	6.60348	0.0959	0.909056667	0.29246	0.835148			
OROMIA	Borana		6.454464	11.32896	4.652167	23.70995	2.00573	0.01643	0.255013333	1.8641333	5.54598			
OROMIA	S.W. Shewa		86.88948	0.186258	30.82044	13.23222	4.48824	0.02259	15.97956	2.9152775	0.925905			
OROMIA	Guji		8.882535	19.34793	8.87329	20.60342	0.01941	0	0.05051	3.76888	1.44306			
SNFR	Gurugi		26.45154	13.52384	15.51799	29.94679	9.140173	0.071453333	1.343636667	3.3121357	1.69627			
SNFR	Hadya		24.34523	4.29235	29.3401	19.58296	7.337044	0.433426667	0.208496667	2.682208	1.27634125			
SNFR	KT		10.76631	1.085965	12.61423	20.44886	3.329636	1.321165	0.080795	0.527765	0.99801125			
SNFR	Sidama		2.332023	7.687433	4.183723	31.53168	0.536433	2.58221	0	1.6049533	9.184995			
SNFR	Gedeo		0.076964	2.915285	0.584947	6.279433	0.060245	0	0.00427	0.6661129	0.203618			
SNFR	Welayita		18.091	1.06378	4.210428	18.86684	3.1029	0.073825	0.841323333	1.8573925	7.509785			
SNFR	South Onno		3.868286	2.974823	0.980899	9.321961	11.17254	0.123418	0.000575	0.876638	1.972755			
SNFR	Sheka		0.606128	0.175793	0.1861	1.524538	4.947198	0.14147	0	1.4973425	0.18464			
SNFR	Kaffa		17.87784	7.519569	6.679923	12.23896	10.03271	0.593596667	0.00017	8.7649788	2.6096975			
SNFR	Gamo Gofa		27.02321	18.43521	12.80603	16.0921	9.915895	0.157075	0.444655	4.1108525	4.5459125			
SNFR	Bench Maji		3.543601	1.166491	0.240565	0.884266	4.833967	0.068266667	0	1.3482013	0.915537143			
SNFR	Yem SW		4.032286	1.183861	2.923523	1.651244	0.688398	0.009975	0.00774	0.800565	0.015515			
SNFR	Amaro SW		1.972291	0.866671	0.779726	0.82543	0.185483	0.012045	0.25499	0.4383843	0.288312857			
SNFR	Burji SW		0.833169	0.237646	0.488668	0.634726	0.729163	0	0.3082425	0.049606	0.923115			
SNFR	Konso SW		2.407133	0.142572	0.06	4.394214	9.39251	1.563516667	0.169415	0.202392	1.98885			
SNFR	Draha SW		1.270234	0.515025	0.222997	3.37009	6.32841	0	0.371934286	0.0796417	0.902841429			
SNFR	Dawro		10.72960	0.980243	1.484558	3.8512	3.238718	0	0.03815	4.15192	1.30005			

Select crops in basket

Source List: [Empty list box]

Destination List:

- Barley
- Chick Peas
- Field Pea
- Haricot Bean
- Horse Bean
- Lentils
- Maize
- Potatos
- Sorghum
- Sweet Potatos
- Teff
- Wheat

Navigation buttons: >, >>, <, <<

OK Cancel

Select Parameter to View



Boundaries:

Beneficiaries method 1 in count (2006)

[c:\Wfp\Images\Livelihood\RUN1\2006\Beneficiaries method 1_2006.img]

Compare to Normal

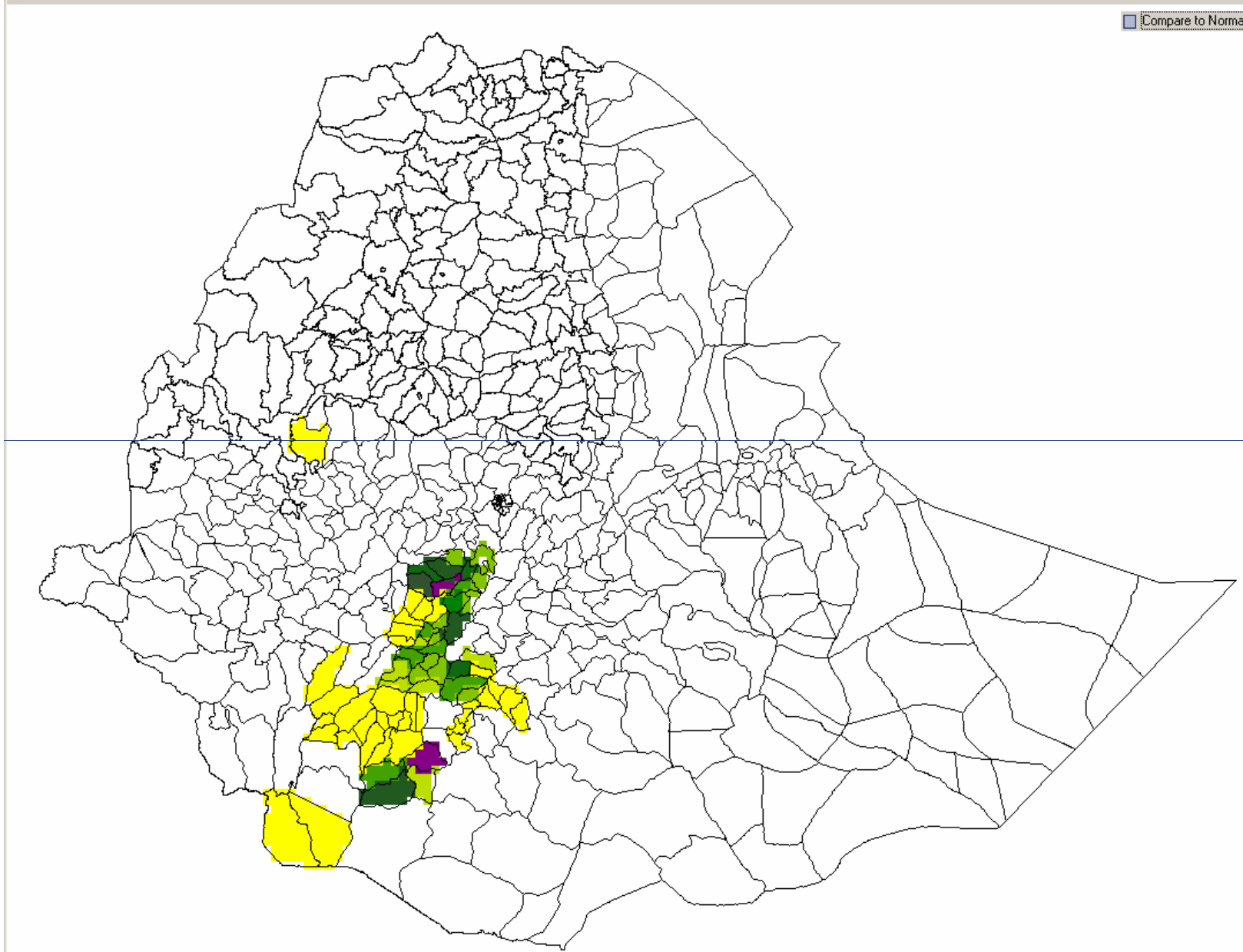
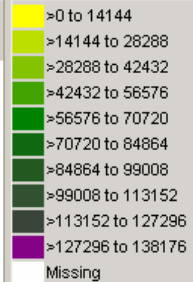
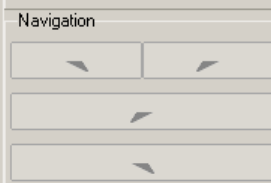


Image Values
Value: Missing
Pixel: 141 Line 0
Longitude: 46.76 Latitude 15.13



Display in Google Earth

Aggregate to Excel