APPLICATION OF REMOTE SENSING for DROUGHT MONITORING IN CENTRAL HIGHLANDS & SOUTH CENTRAL COAST IN DRY SEASON 2015 -2016

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Hanoi, May 2016

Background

- The most severe drought in 30 years in dry season 2015-2016
- 60% of coffee cultivated area was able to irrigated
- 100.000 hectare of coffee plantation was facing with drought.
- 100m depth borehole without water
- Water volume decreased 49% in Serepok river
- Agriculture yield would be heavily lost in 2016-2017
- Heading to a famine and unsustainable socio-economy

(*VICOFA, 2016*)

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Why Remote sensing?

Analysis of time-series satellite data/ historical remote sensing images would answer questions related to drought supports for decision making:

- What
- Where
- How
- When
- Why

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Data

Thermal remote sensing data

- MODIS
- LANDSAT
- ASTER
- …

Free sources:

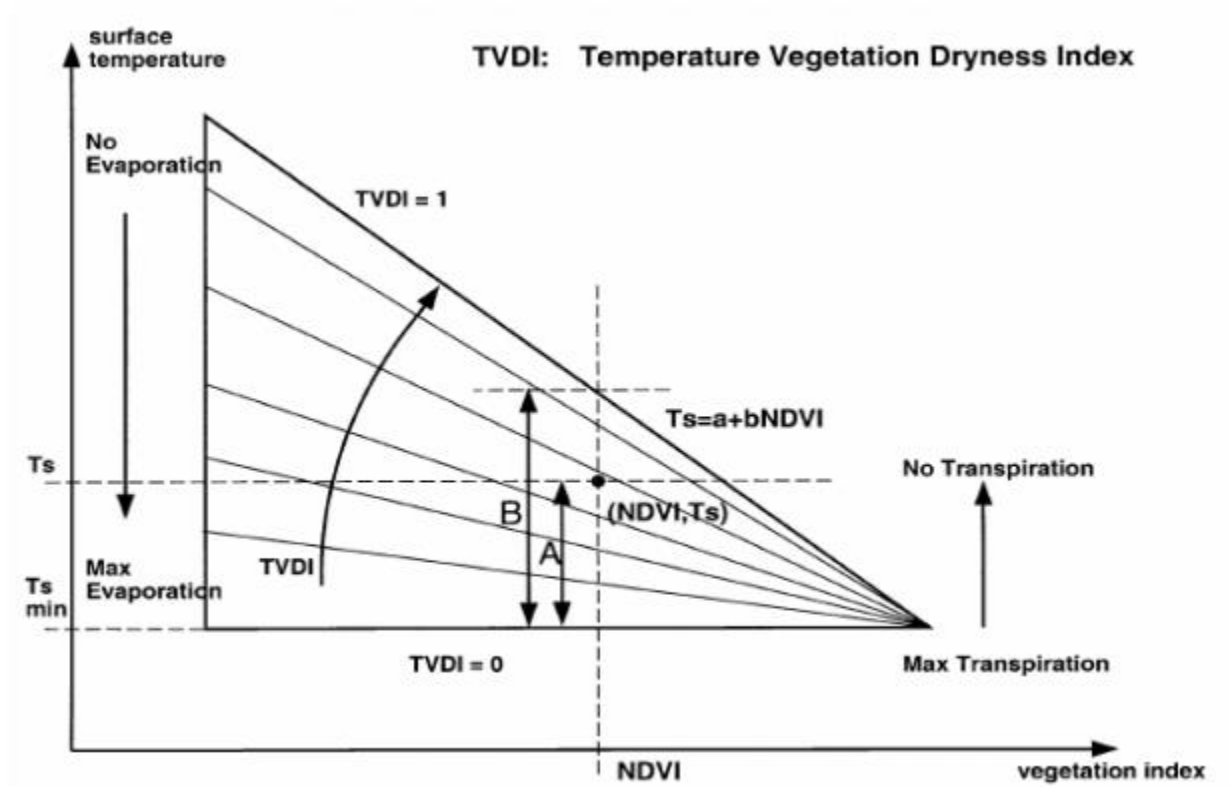
http://glovis.usgs.gov

http://reverb.echo.nasa.gov

http://earthexplorer.usgs.gov

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Methods



$$TVDI = \frac{T_s - T_{s\min}}{T_{s\max} - T_{s\min}} = \frac{T_s - T_{s\min}}{a + b * NDVI - T_{s\min}} \quad \text{(Sanholt, 2002)}$$

Results

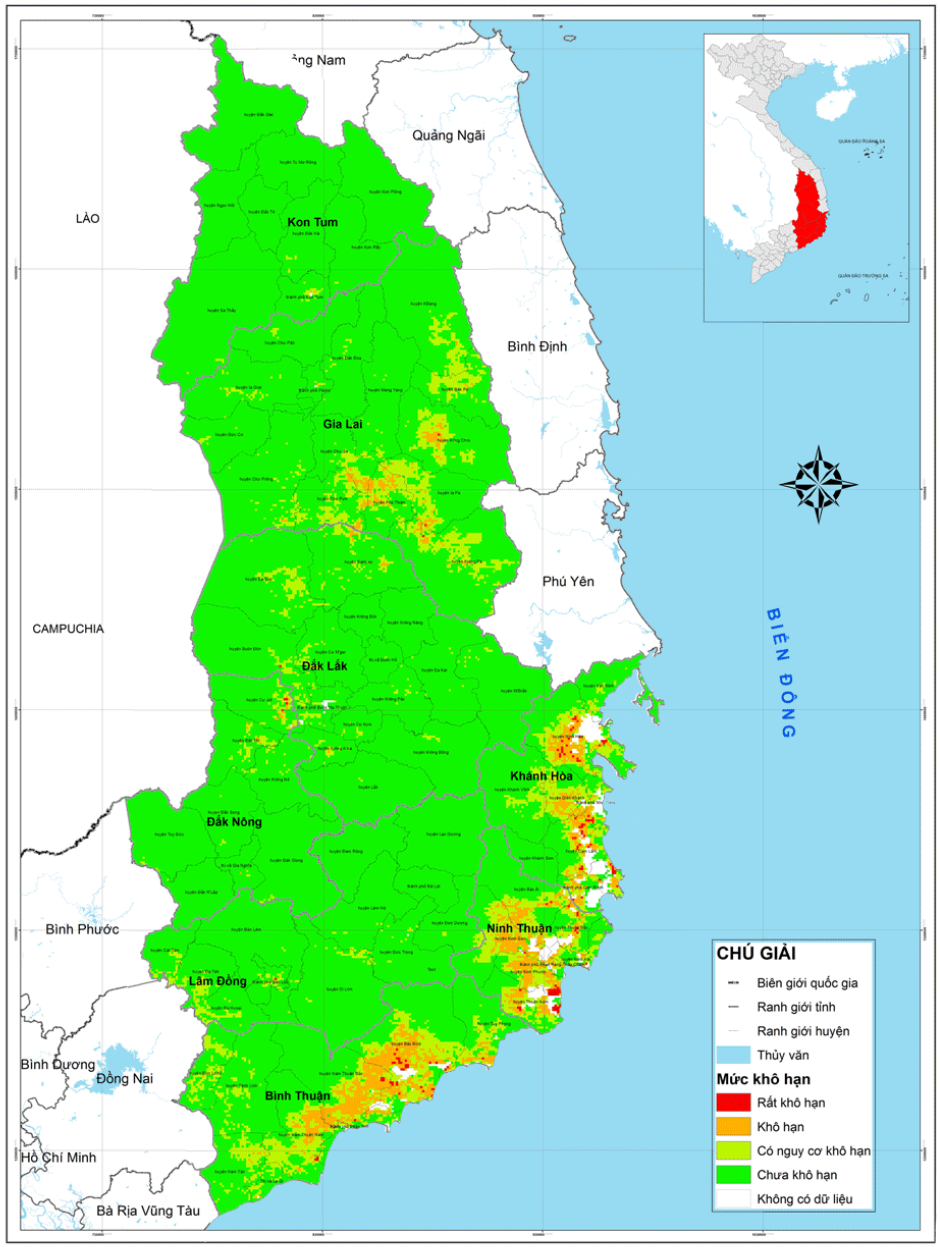
Used data: MODIS

(adapted from Mauro E. Holzman và Raúl E. Rivas, 2015)

Mức độ cảnh báo khô hạn	Ngưỡng giá trị TVDI	Thang màu cảnh báo
Rất khô hạn	0,7 – 1	
Khô hạn	0,55 – 0,7	
Có nguy cơ khô hạn	0,4 – 0,55	
Chưa khô hạn	< 0,4	



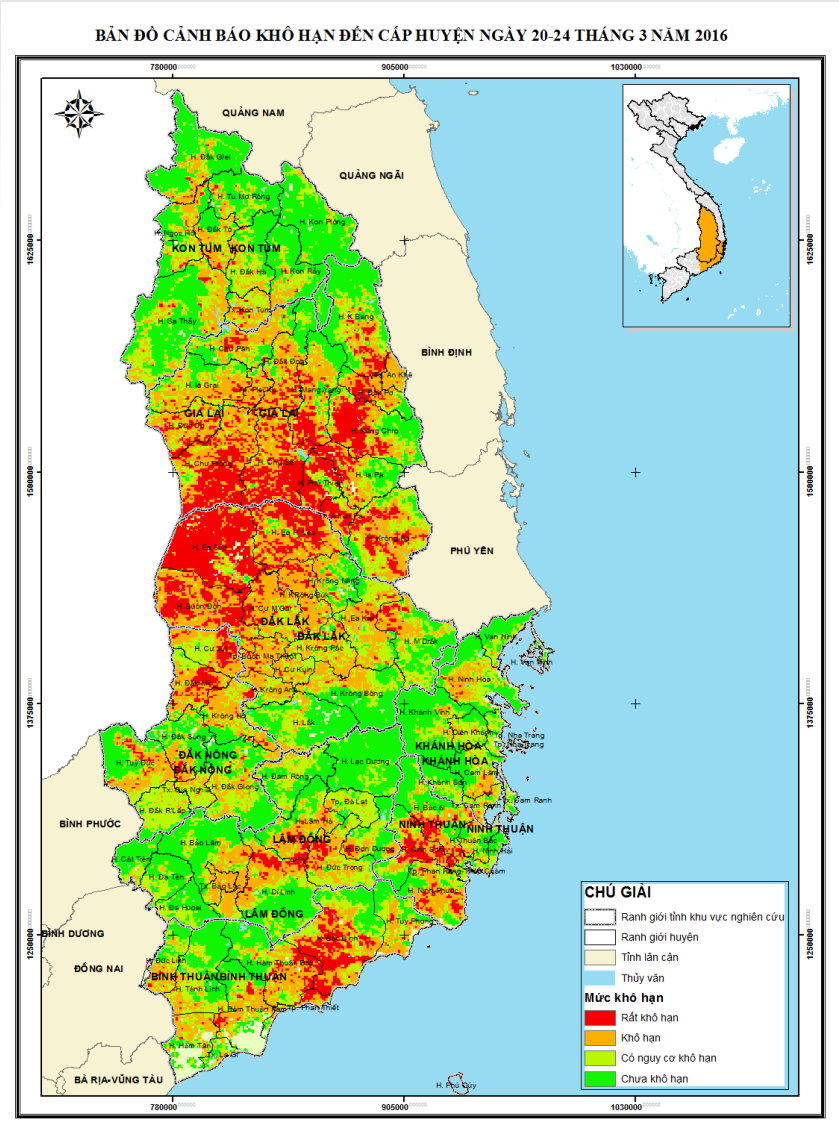
BẢN ĐỒ KHÔ HẠN NGÀY TRUNG BÌNH THÁNG 9 NĂM 2015

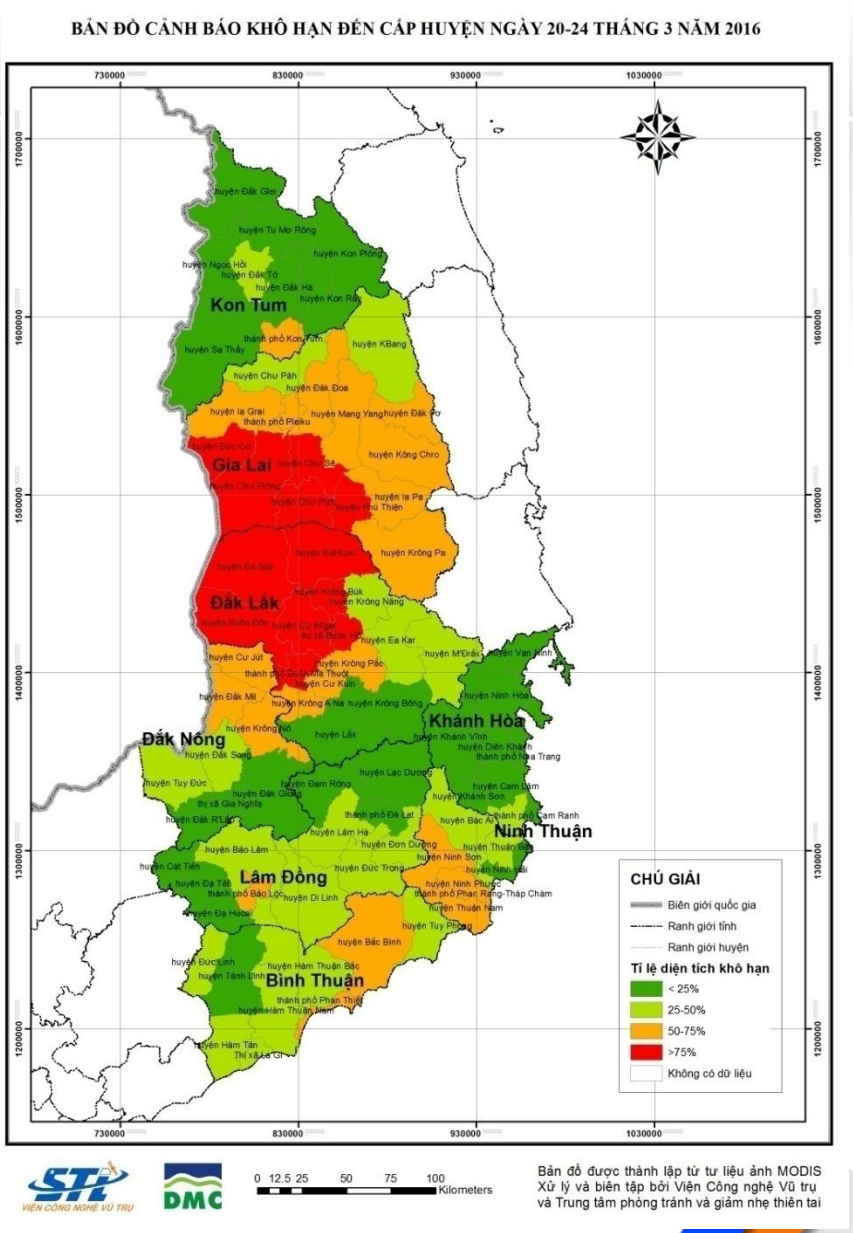


Severe drought impacted areas

TT	Tỉnh	Diện tích tự nhiên (Km2)	Diện tích bị hạn hán (tính đến 24/3/2016)			
			Diện tích bị hạn (Km2)	% bị hạn	Diện tích hạn nặng (Km2)	% hạn nặng
1	Ninh Thuận	3,362.39	991	29%	477	14%
2	Bình Thuận	7,932.73	2227	28%	896	11%
3	Khánh Hòa	4,759.32	590	12%	40	1%
4	Lâm Đồng	9,805.43	1971	20%	393	4%
5	Đắk Lắk	13,057.09	4774	37%	3097	24%
6	Đắk Nông	6,514.69	1995	31%	503	8%
7	Kon Tum	9,698.07	1633	17%	147	2%
8	Gia Lai	15,544.64	5671	36%	3971	26%
Tổng cộng		**70,674.38**	**19,852.00**	**28%**	**9,524.00**	**13%**

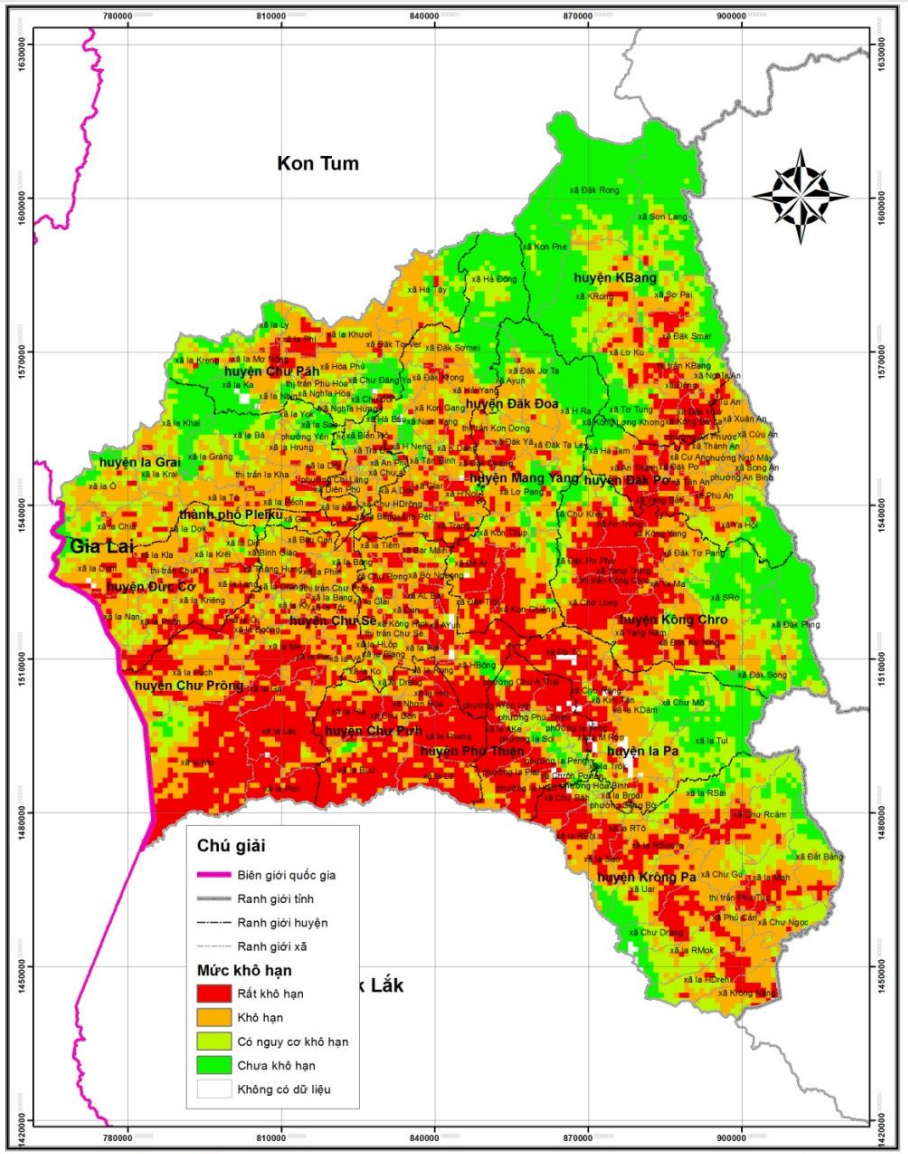
Regional scale





Provincial scale





District impacts

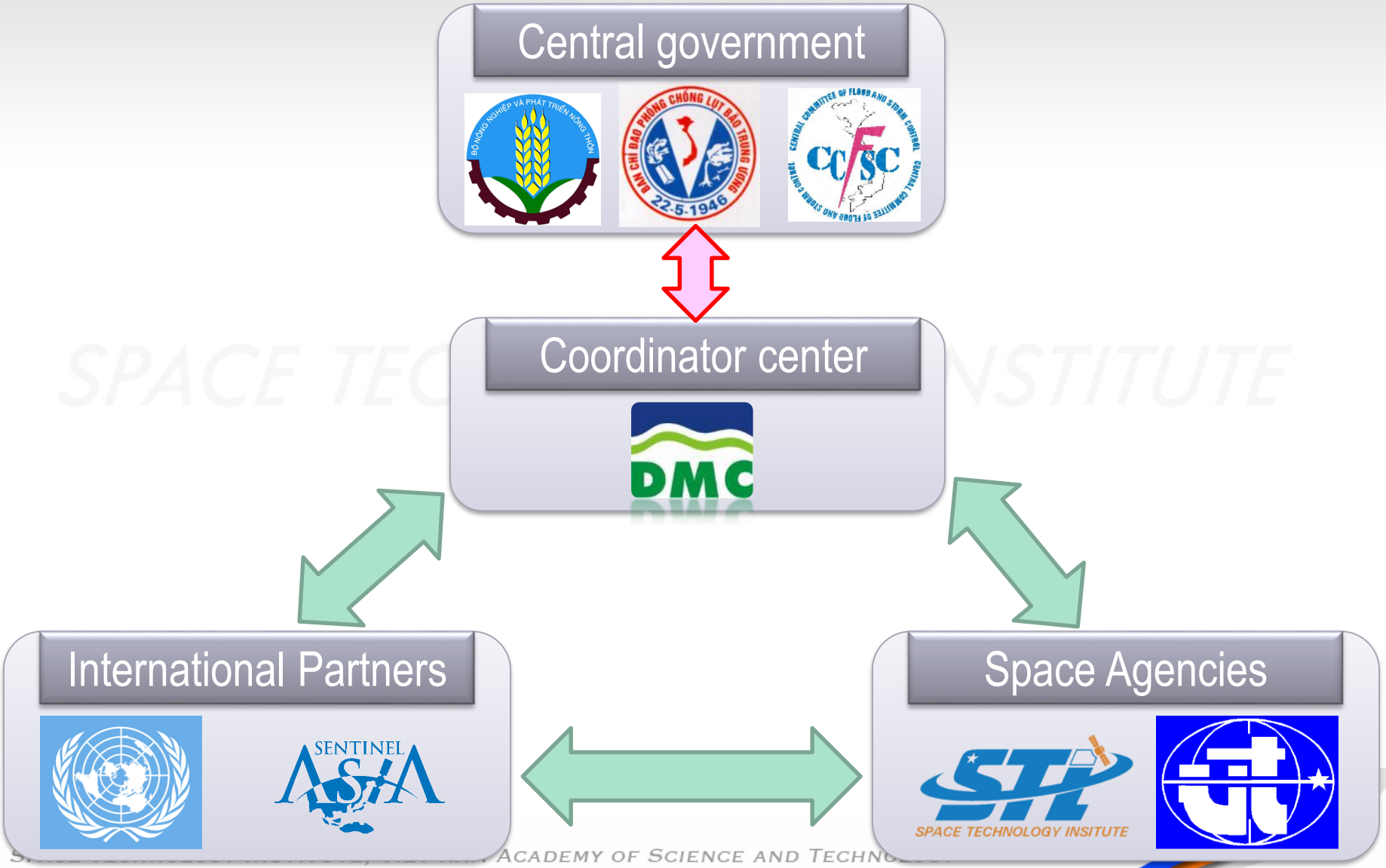
				Area	Percentage
Gia Lai					
Huyện Chư Păh	978.4016986	391	40.1	70	7.2
Huyện Chư Prông	1696.600645	701	41.4	824	48.7
Huyện Chư Pưh	718.5250391	182	25.5	510	71.3
Huyện Chư Sê	646.7956371	335	52.1	229	35.6
Huyện Đăk Đoa	984.1588894	422	43.1	138	14.1
Huyện Đăk Pơ	702.7923998	362	51.5	131	18.6
Huyện Đức Cơ	720.657027	400	55.6	162	22.5
Huyện Ia Grai	1154.08106	523	45.2	65	5.6
Huyện Ia Pa	870.8648825	258	30.6	184	21.8
Huyện KBang	1842.748342	300	16.3	165	9.0
Huyện Kông Chro	1449.28272	356	24.5	480	33.0
Huyện Krông Pa	1917.399078	745	38.9	457	23.8
Huyện Mang Yang	1129.070182	447	39.8	235	20.9
Huyện Phú Thiện	505.6302258	110	22.0	291	58.2
Thành phố Pleiku	227.6344422	139	60.7	30	13.1

Lessons and Learn

- Cooperation and coordination
- Data variety
- Technical experts
- Field work, verification
- Prediction and warning
- Information distribution
- Decision making and disaster response
- Policy and financial resource

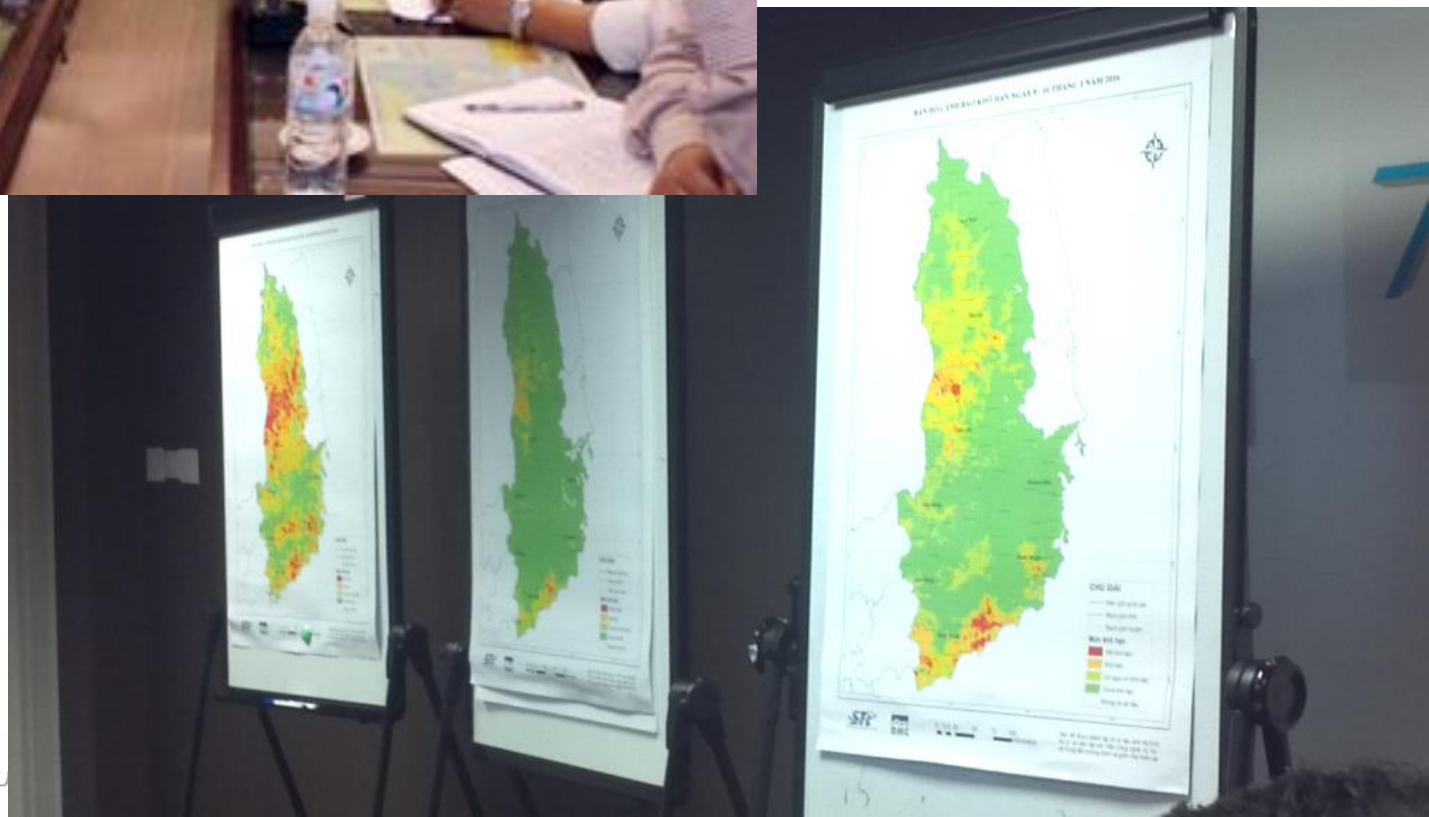
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Coordination

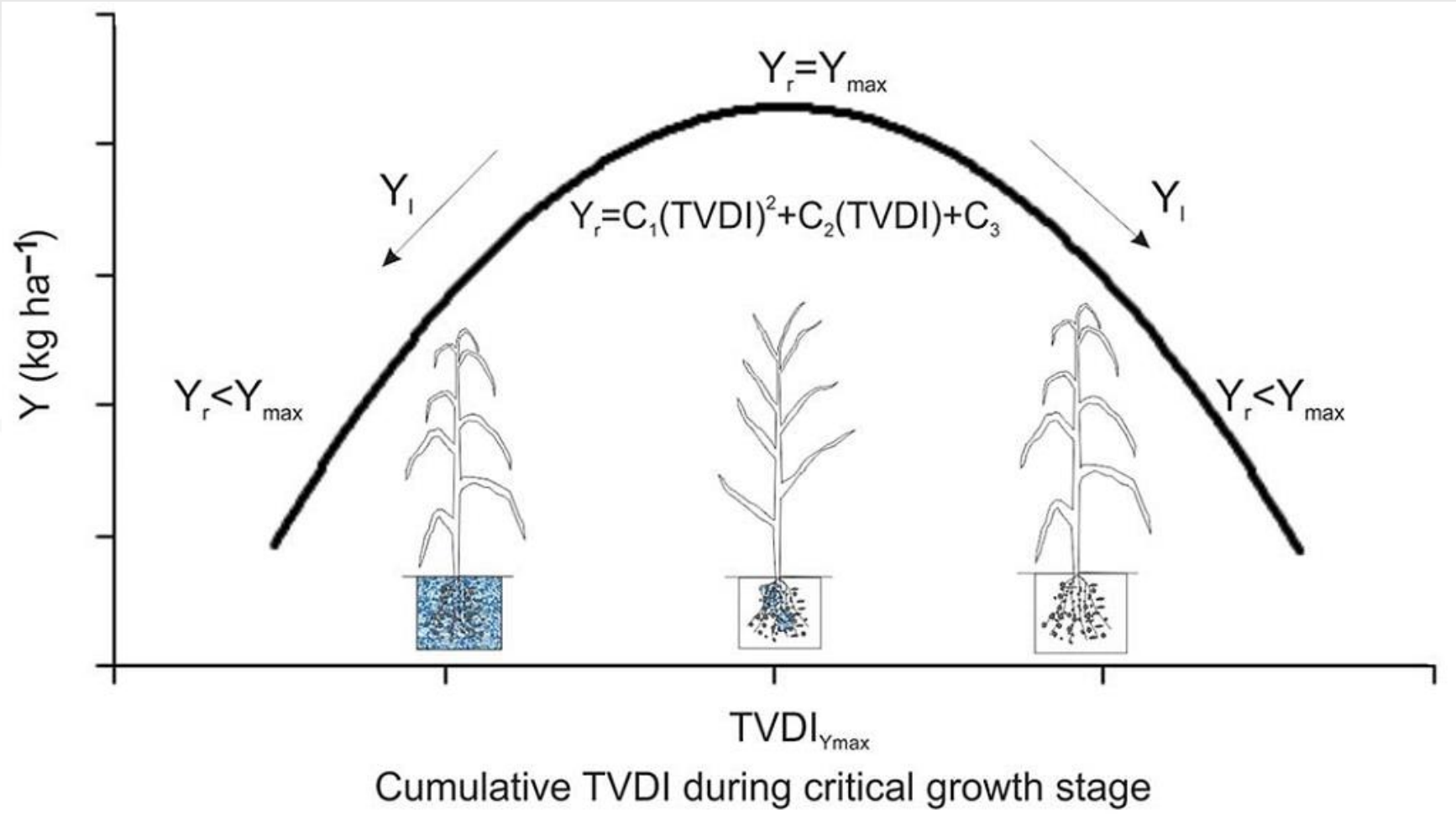


Disaster Response

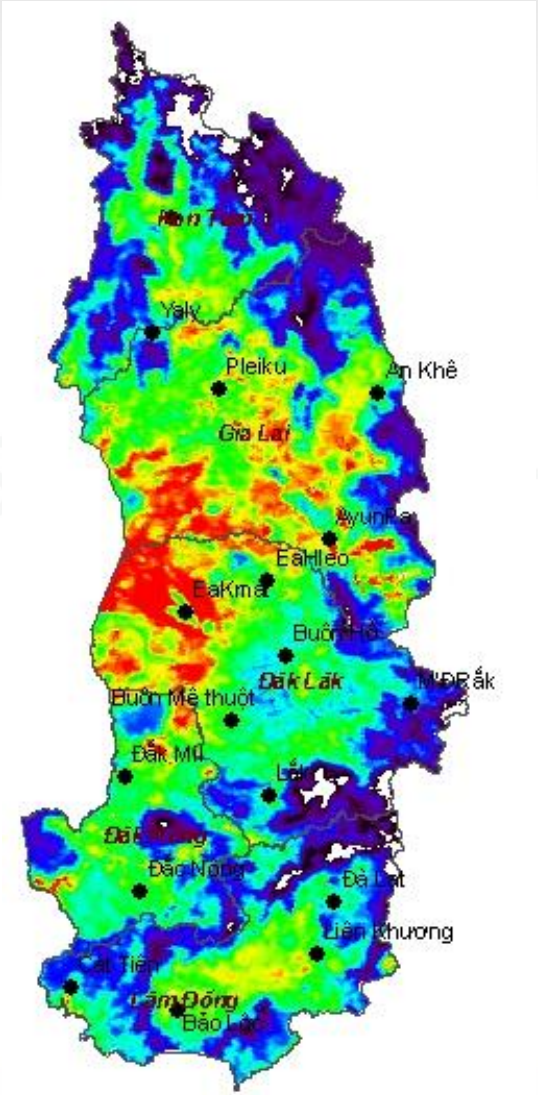




Yield prediction

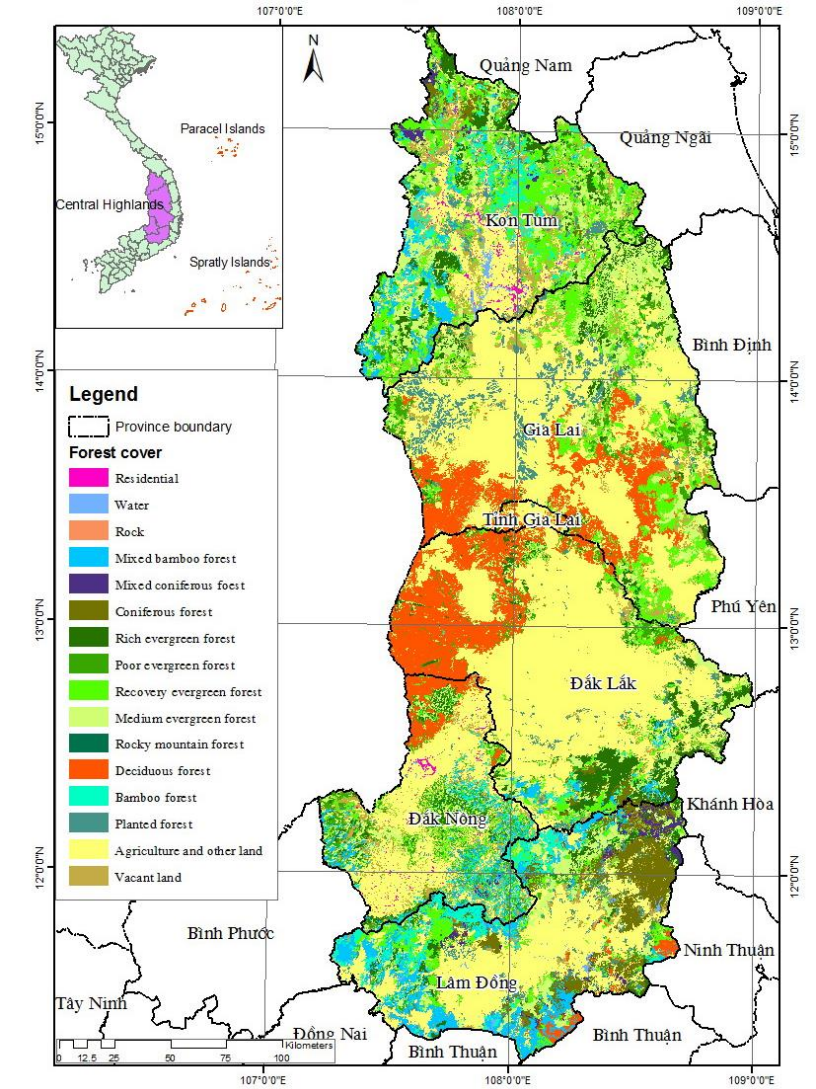


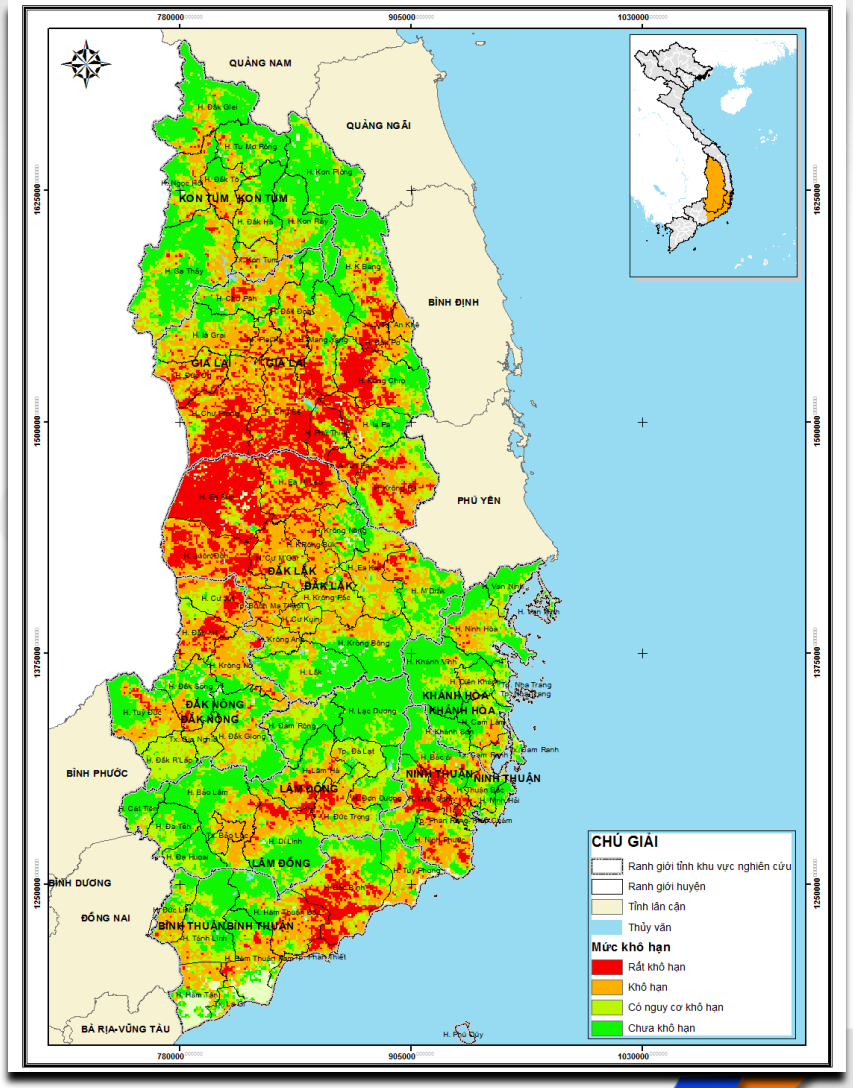
Yield prediction



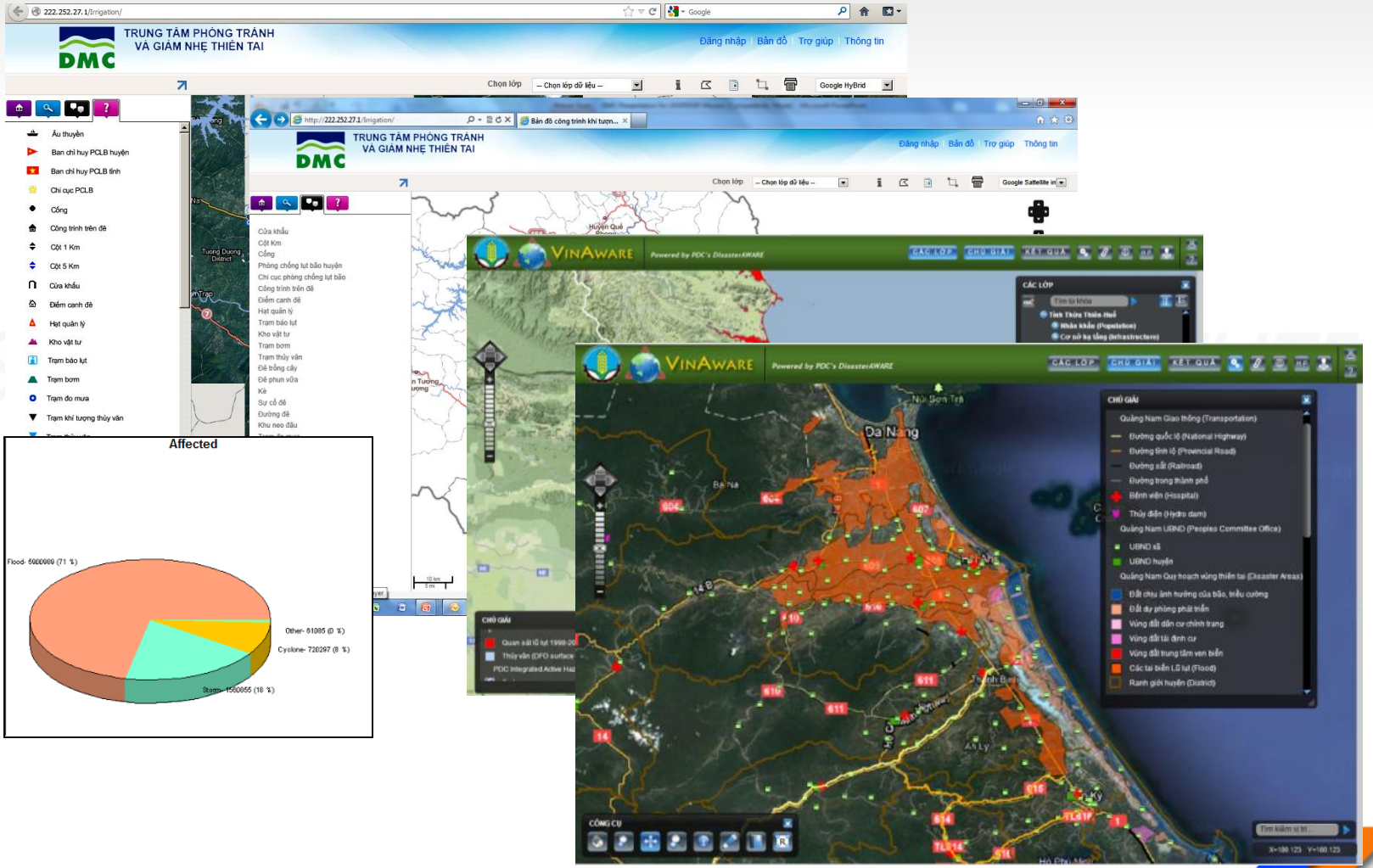


Damage estimation





WebGIS


TRUNG TÂM PHÒNG TRÁNH
VÀ GIẢM NHẸ THIÊN TAI
DMC
Đăng nhập | Bản đồ | Trợ giúp | Thông tin
Chọn lớp
Google HyBrid
Google Satellite
Affected
Flood- 6000000 (71 %)
Other- 61085 (0 %)
Cyclone- 720297 (8 %)
Storm- 1560855 (18 %)
VinAware
Powered by PDC's DisasterAWARE
CÁC LỚP
CHÚ GIẢI
CÔNG CỤ
Da Nang



Thank you!