

# MAPPING FOREST LANDSCAPE RESTORATION OPPORTUNITIES IN GHANA



WORLD  
RESOURCES  
INSTITUTE



Bundesministerium  
für Umwelt, Naturschutz  
und Reaktorsicherheit



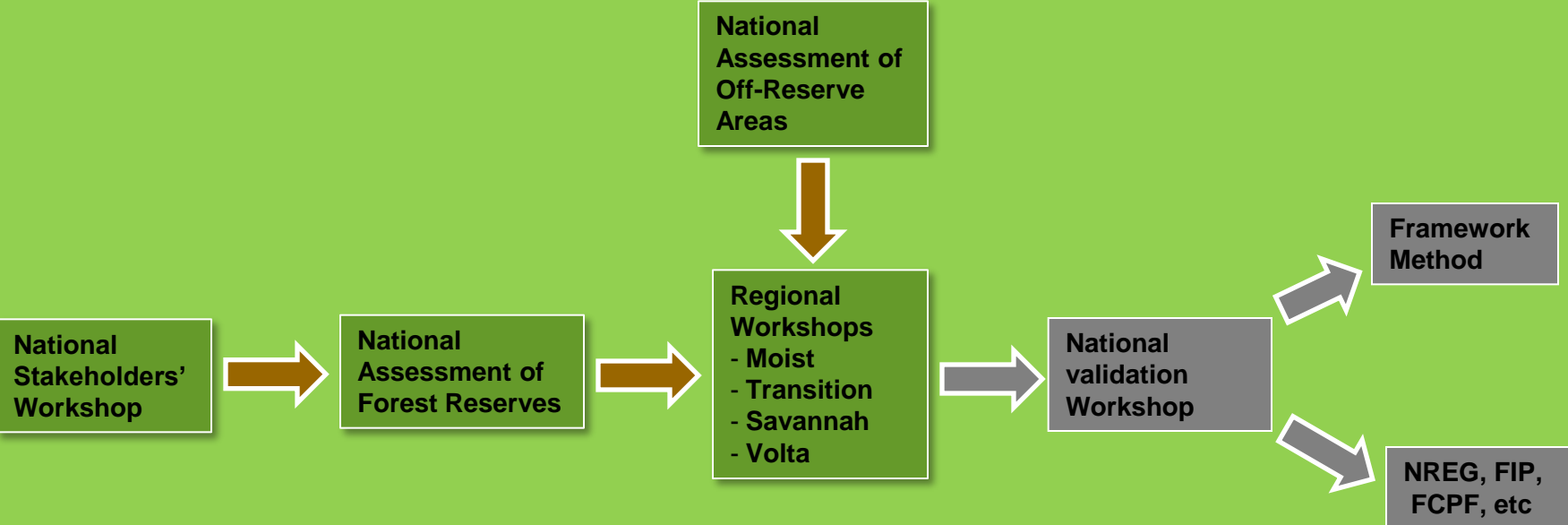
Assessment of Forest Landscape Restoration Potential In Ghana To Contribute To REDD+ Strategies For Climate Change Mitigation, Poverty Alleviation And Sustainable Forest Management



Assessing and Capitalizing on the Potential to Enhance Forest Carbon Sinks through Forest Landscape Restoration while Benefitting Biodiversity



# PROCESS

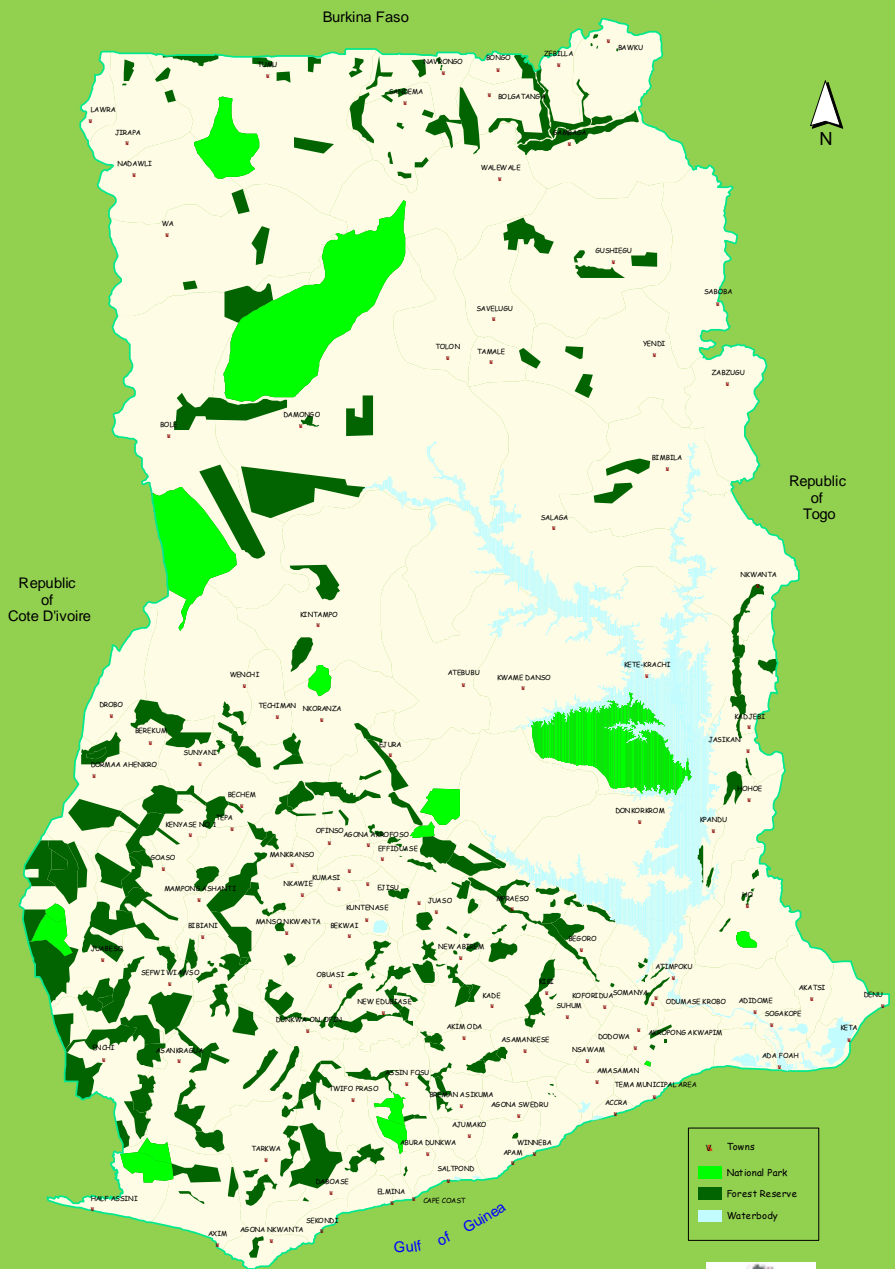


# INCEPTION WORKSHOP

- **Participants informed about the project**
- **Institutional commitments to collaborate with the project secured**
- **The concept of forest landscape restoration communicated and understood**
- **Forest condition scoring proposed for reserves within and outside the high forest zone**

# National Assessment of Forest Reserves

# RESERVES AND NATIONAL PARKS IN GHANA



# FOREST TYPES IN GHANA

Types and subtypes	Area (km <sup>2</sup> )		Percent of total forest area
	subtype	type	
Wet Evergreen		6,570	8.1
Moist Evergreen		17,770	21.9
Upland Evergreen		292	0.3
Moist Semi-deciduous		32,890	40.4
- South-east	18,460		
- North-east	14,430		
Dry Semi-deciduous		21,440	26.4
- Inner Zone	8,630		
- Fire Zone	12,810		
Southern Marginal		2,360	2.9
South-East Outlier		20	0.03
<b>Total Forest Area</b>		<b>81,342</b>	<b>100</b>

# **FOREST COVER MAPPING IN RESERVES: RATIONALE**

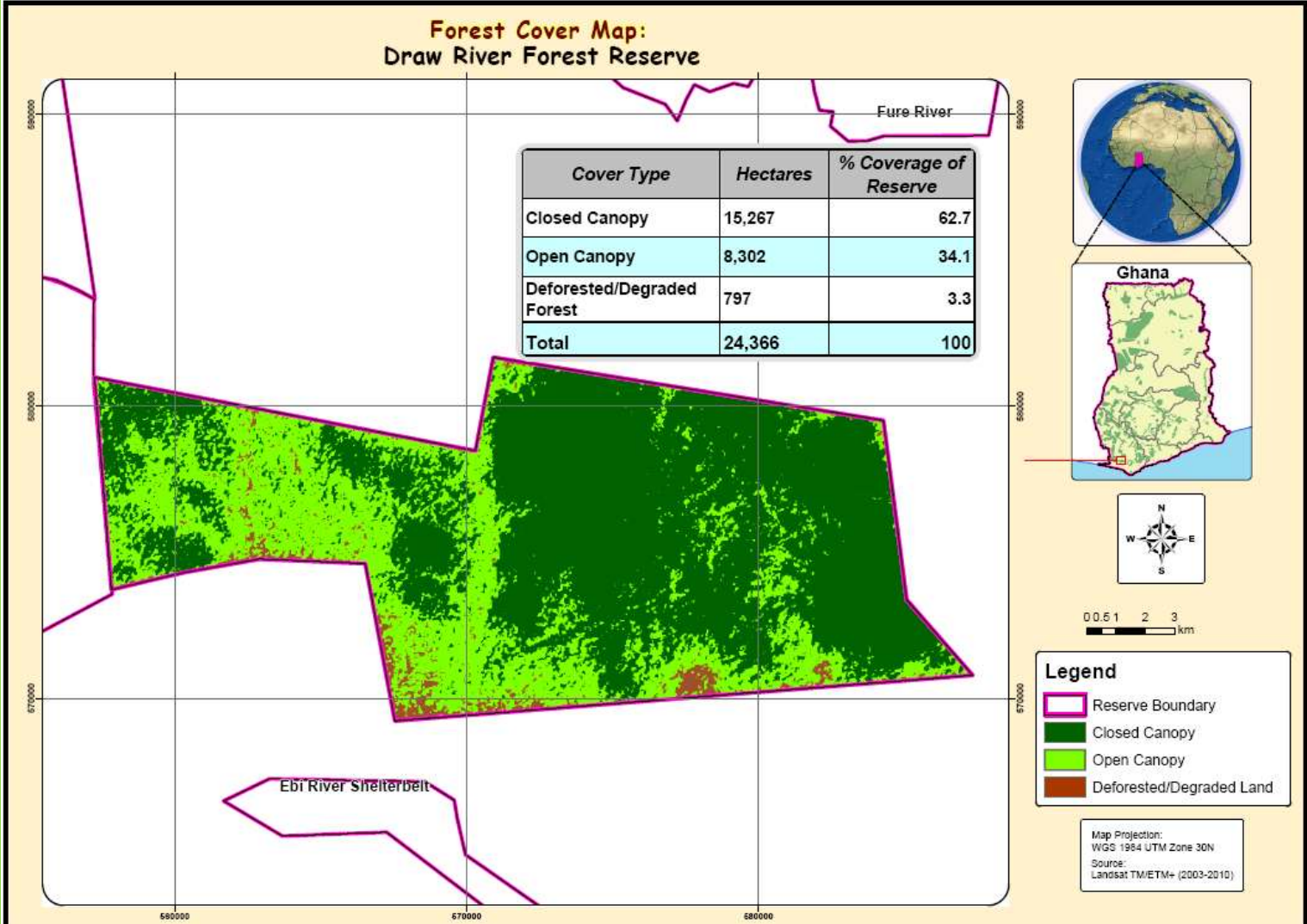
- **Constraints on restoration are much smaller in reserves than off reserves**
- **Presence of degradation in reserves usually implies opportunity for restoration**
- **There is a strong interest in Ghana to assess degradation status of forest reserves**
- **Forest reserves provide a comparatively easy and well known starting point for method development**



# FOREST COVER MAPPING IN RESERVES

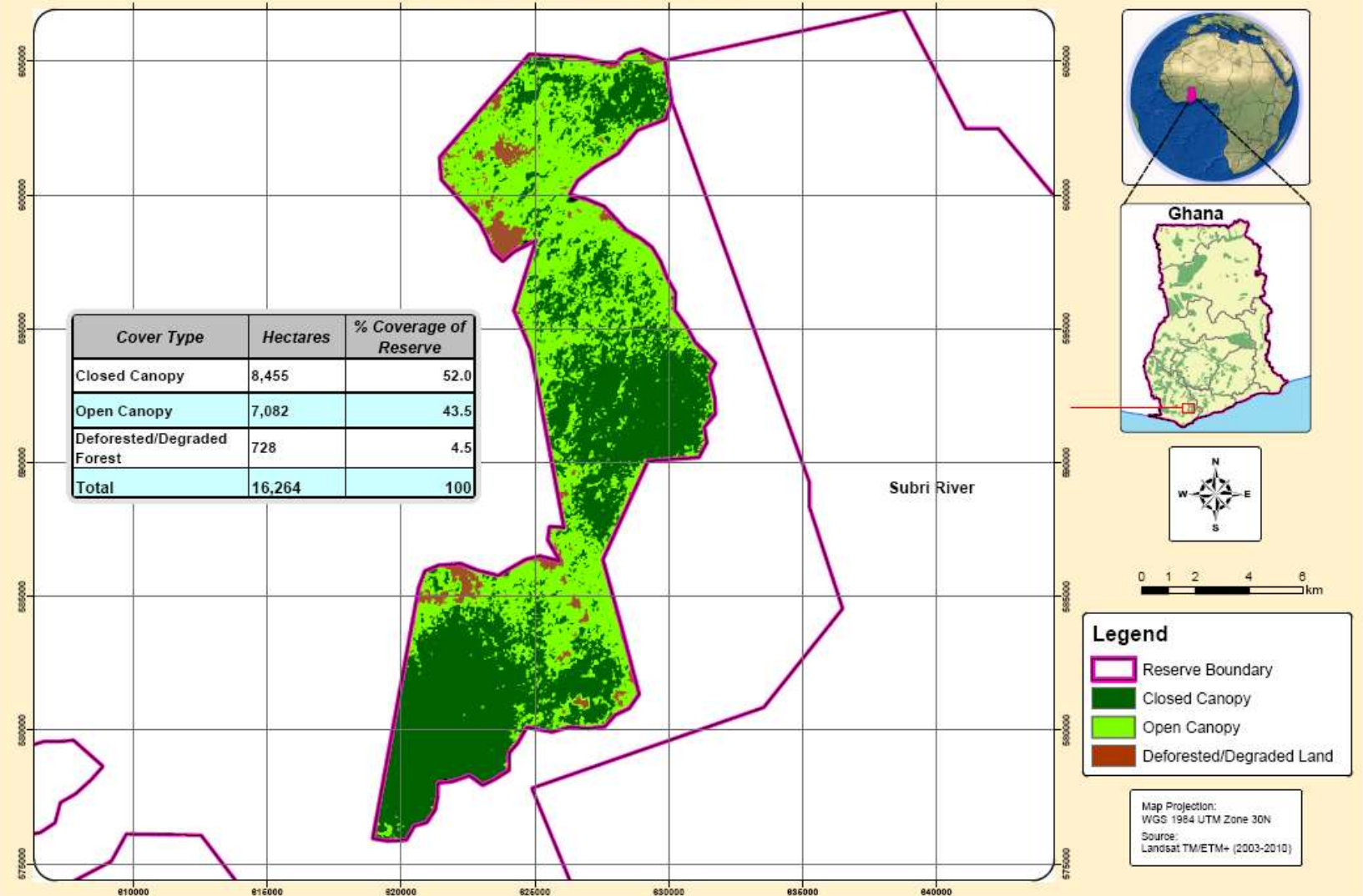
- **Select, acquire and prepare satellite images**
- **Map and analyze forest cover**
- **Calculate areas of different forest cover types**

# EXAMPLE: DRAW RIVER FOREST RESERVE



# EXAMPLE: BONSA RIVER FOREST RESERVE

Forest Cover Map:  
Bonsa River Forest Reserve



Project Partners:



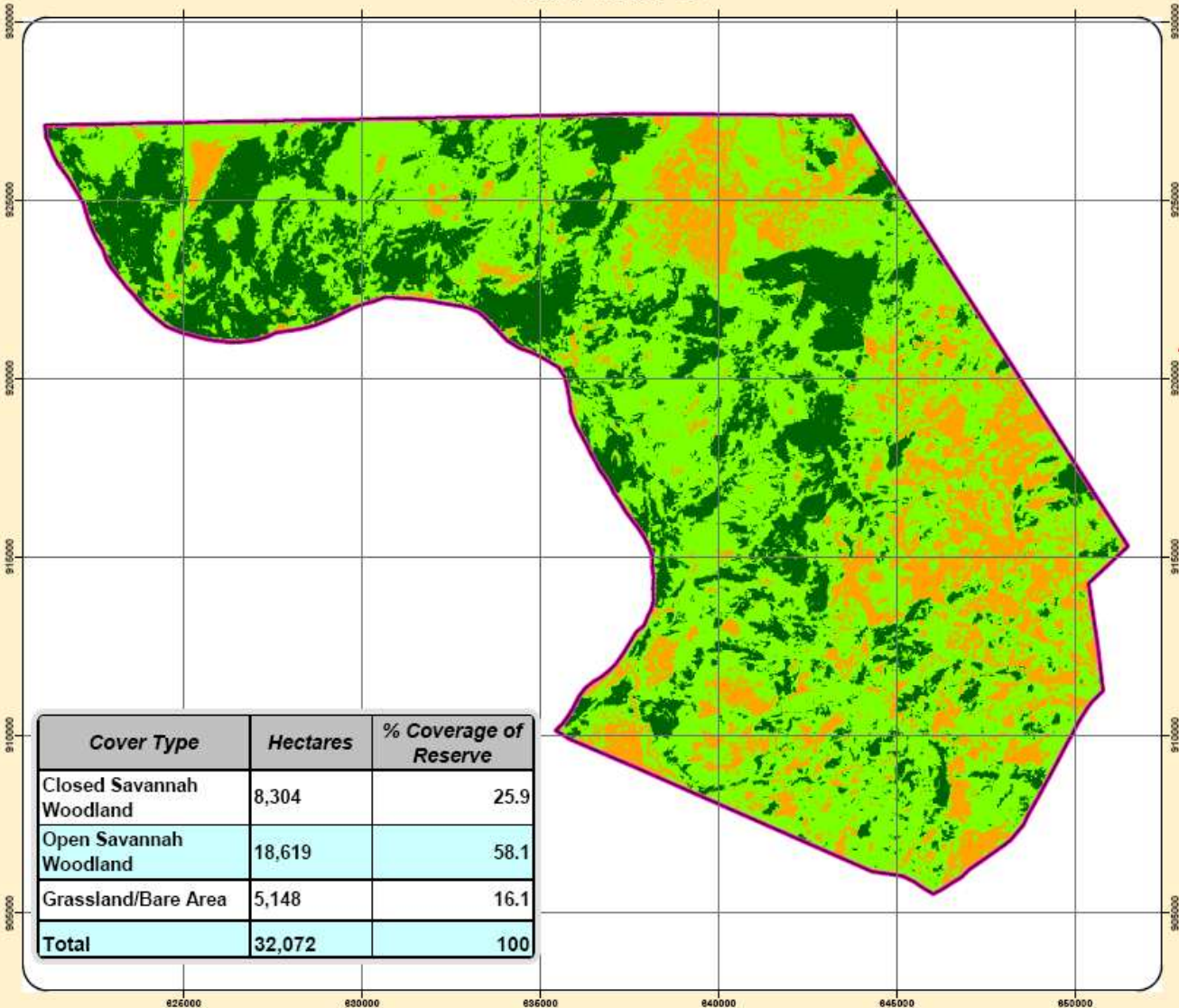
Assessment of Forest Landscape  
Restoration Potential in Ghana.  
Funding Agency:





# EXAMPLE: BURU RESERVE (SAVANNAH REGION)

Savannah Woodland Cover Map:  
Buru Reserve



Cover Type	Hectares	% Coverage of Reserve
Closed Savannah Woodland	8,304	25.9
Open Savannah Woodland	18,619	58.1
Grassland/Bare Area	5,148	16.1
<b>Total</b>	<b>32,072</b>	<b>100</b>

**Legend**

- Reserve Boundary
- Closed Savannah Woodland
- Open Savannah Woodland
- Grassland/Bare Land

Map Projection:  
WGS 1984 UTM Zone 30N  
Source:  
Landsat TM/ETM+ (2003-2010)  
Field Validation:  
May, 2011

Project Partners:

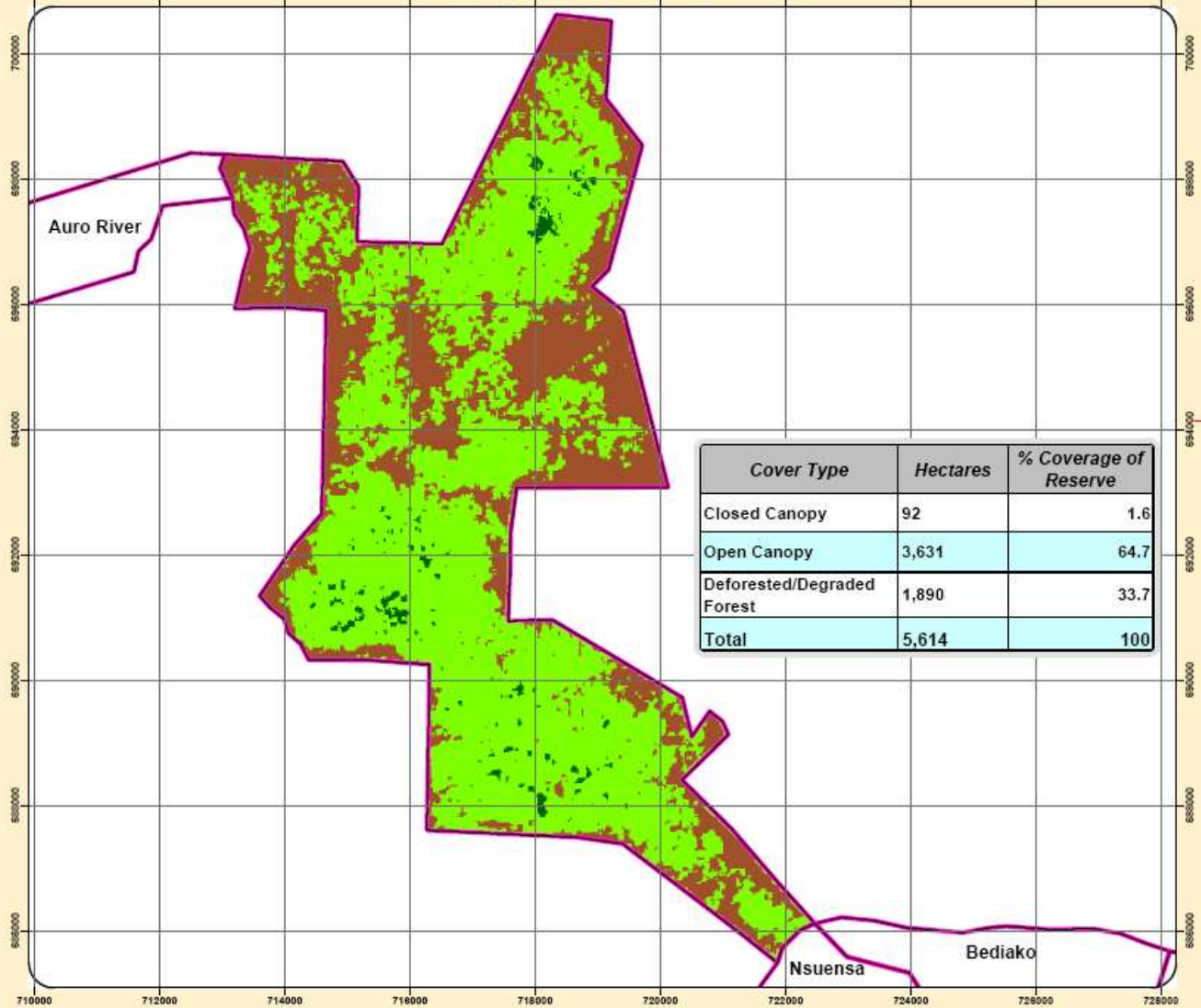


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# EXAMPLE: MAMANG RIVER FOREST RESERVE

Forest Cover Map:  
Mamang River Forest Reserve



Cover Type	Hectares	% Coverage of Reserve
Closed Canopy	92	1.6
Open Canopy	3,631	64.7
Deforested/Degraded Forest	1,890	33.7
<b>Total</b>	<b>5,614</b>	<b>100</b>



**Legend**

- Reserve Boundary
- Closed Canopy
- Open Canopy
- Deforested/Degraded Land

Map Projection:  
WGS 1984 UTM Zone 30N  
Source:  
Landsat TM/ETM+ (2003-2010)

Project Partners:



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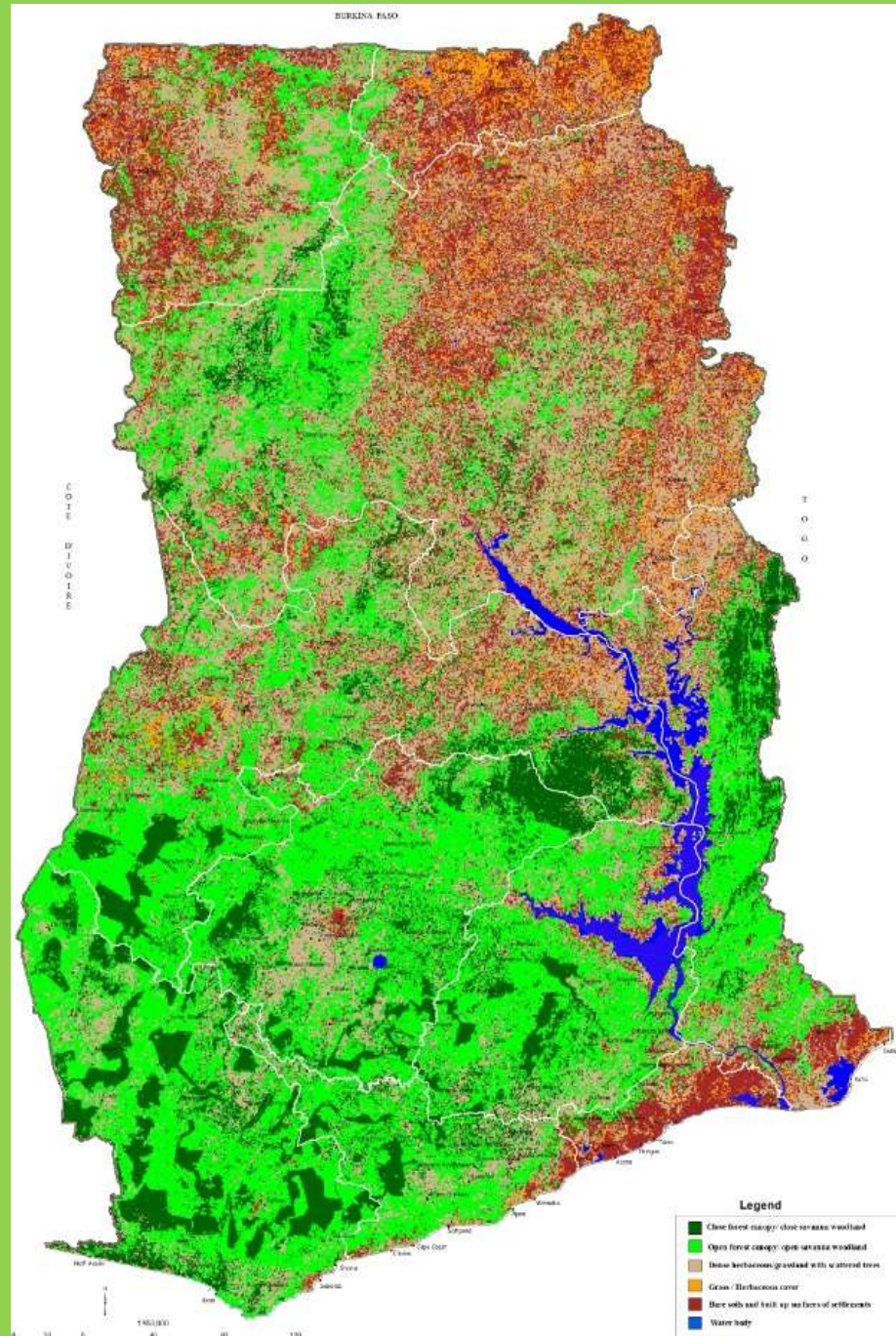


# National Assessment of Off-Reserve Areas



# NEW LAND COVER MAP

- Existing land cover/land use map was outdated and of poor quality
- The most recent Landsat images were selected, acquired, corrected, fused into a mosaic, and interpreted
- New national map to serve as foundation for restoration opportunity assessment, including off reserves



# REGIONAL STAKEHOLDERS' WORKSHOP

Working in small groups, using the new land cover map as a foundation ...

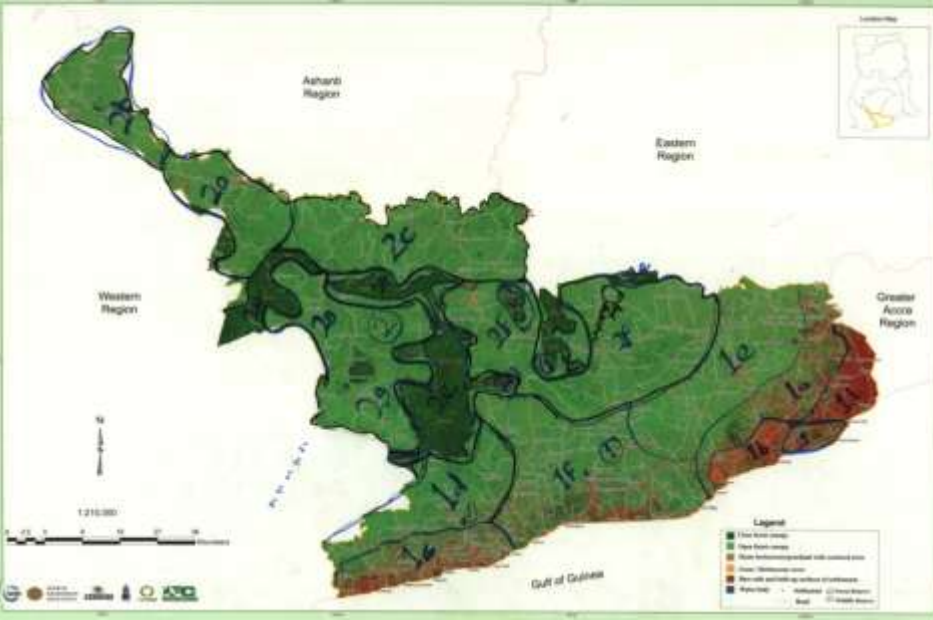
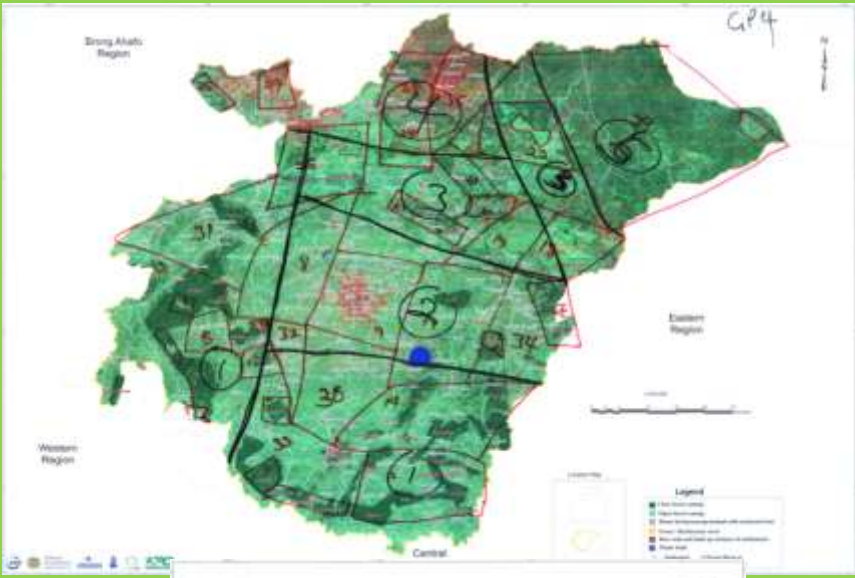
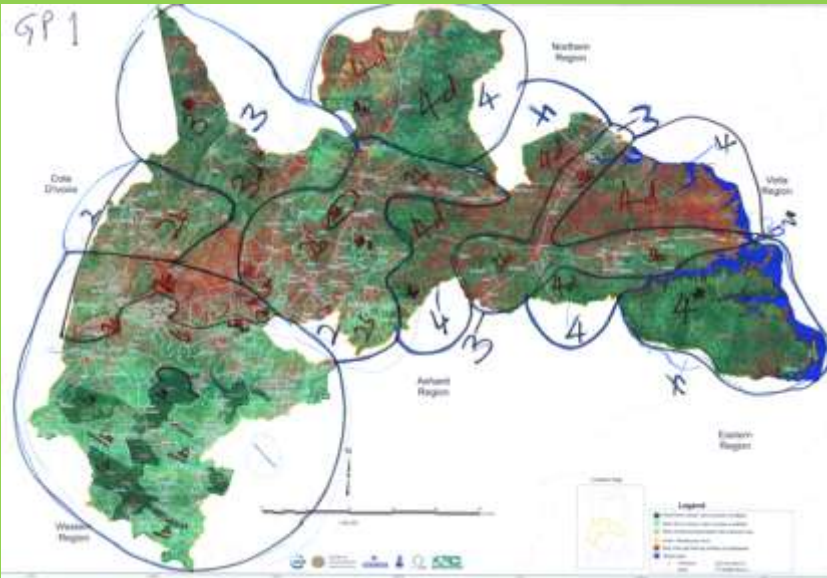
- Delineate and characterize areas on regional maps in terms of restoration needs.
- Describe each polygon in terms of possible and recommended restoration interventions, and obstacles (agro-technical, social, legal, etc)
- Identification of "bright spots", and examples of restoration interventions that have been successful on the ground and could be emulated
- List types of restoration interventions that should be considered along with approximate cost and biomass gain



# REGIONAL WORKSHOPS: INTENSE DISCUSSIONS



# REGIONAL WORKSHOPS: UNREFINED RESULTS

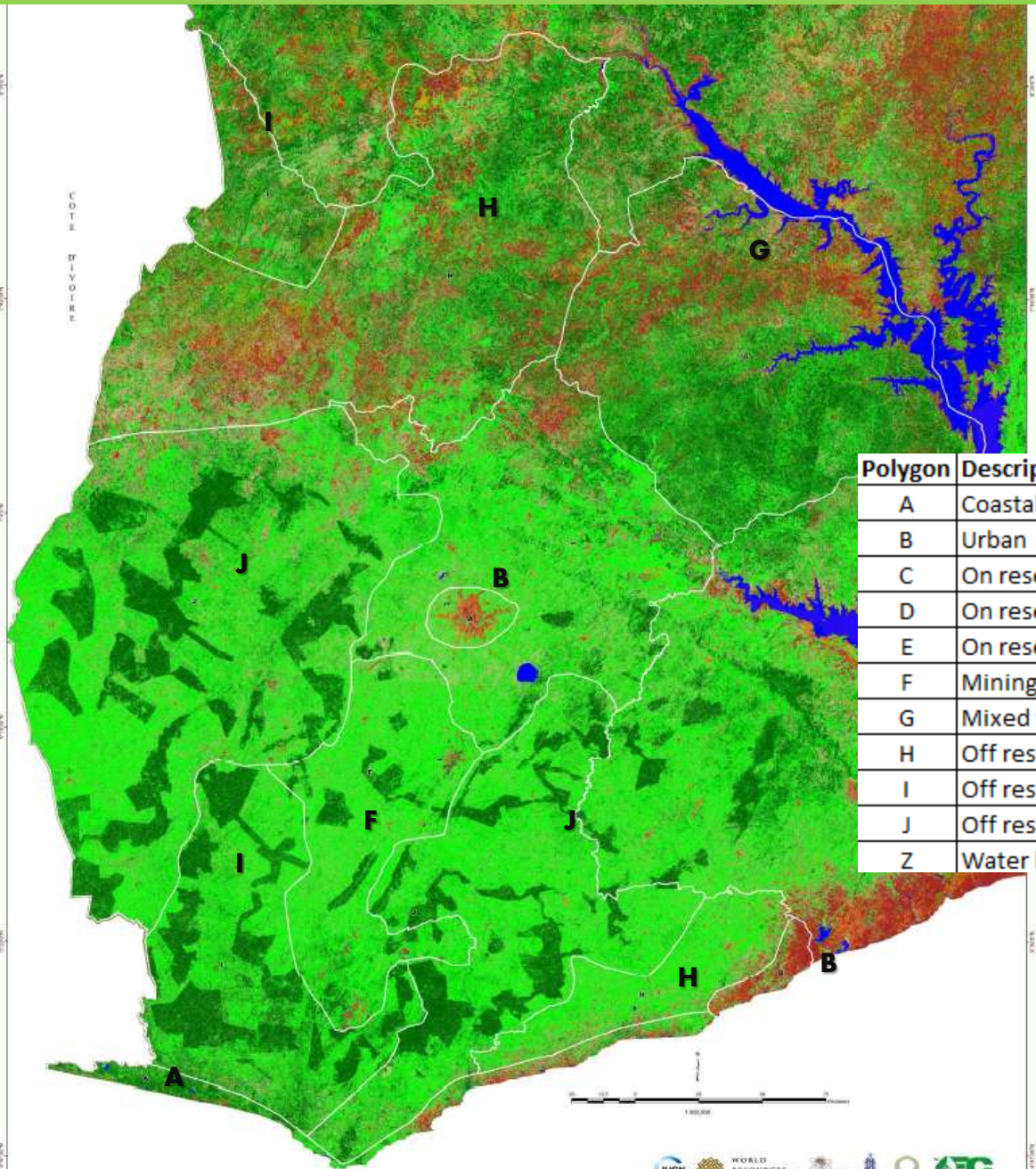




# DRAFT RESTORATION OPPORTUNITY MAP

For parts of Southern Ghana

Following processing and refinement of the output from two regional workshops



Polygon	Description
A	Coastal
B	Urban
C	On reserve, good forest
D	On reserve, degraded forest
E	On reserve, very degraded forest
F	Mining landscape and Agriculture
G	Mixed vegetation, livestock and savanna woodland mosaic
H	Off reserve vegetation, agric, herbaceous fallow, sacred groves
I	Off reserve vegetation, significant secondary forest long fallow
J	Off reserve vegetation, forest fallow, short fallow
Z	Water body