Educating professionals and sub-professionals for managing invasive flora in Bangladesh
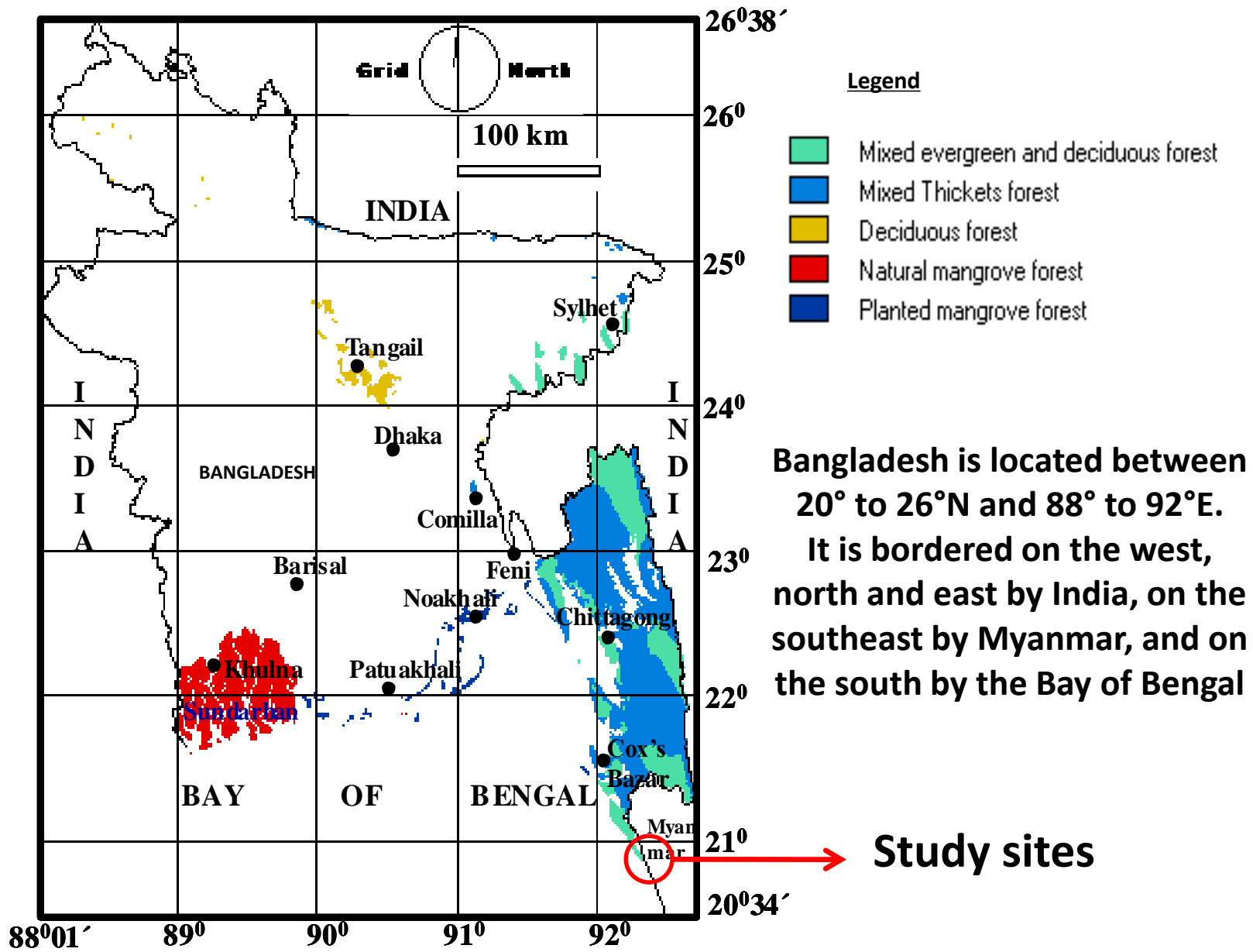
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Acknowledgements

Map 1. Forest cover in Bangladesh (Al-Amin, 2012)

Legend

- ▨ Mixed evergreen and deciduous forest
- ▨ Mixed Thickets forest
- ▨ Deciduous forest
- ▨ Natural mangrove forest
- ▨ Planted mangrove forest

Bangladesh is located between 20° to 26°N and 88° to 92°E. It is bordered on the west, north and east by India, on the southeast by Myanmar, and on the south by the Bay of Bengal

Study sites

Bangladesh ⟹ Most densely-populated

⬇

Vulnerable to natural disasters and now becoming highly-affected by climate change

⬇

Tropical cyclones, storms and surges are major features of the coastal zone's climate

⬇

High pressure on natural resources

⬇

Degraded forests and ecosystems are more vulnerable to climate change

⬇

Forest cover has been declining by 2.1 percent annually in the last three decades

⬇

Forest cover is estimated to be around 2.56 million hectares (m ha), or 17.8 percent of Bangladesh's total land area

Forest types	Legal status	Area (000ha)
Semi evergreen forest (Hill forest)	Major areas are Reserved Forest with smaller areas of Protected forest , Acquired and Vested forest	638.06
Deciduous forest (Sal forest)	Forest of different districts has different status , Some areas are Reserved Forest, Some are Protected Forest and some are Acquired and vested forest	120.69
Natural Mangrove Forest (Sundarbans Reserved Forest)	Reserved Forest	607.7
Artificial mangrove forest (Coastal Plantations)	Some portion declared as reserved and some portion yet to complete the declaration phase	130
Wet land Forest (Swamp Forest)	Reserved Forest or near finishing the declaration phase	23.59
Unclass State Forest (USF)	District administration controlled forest	17.35

This study focused on

➢ **Invasive species (flora) of Bangladesh**

➢ **Training: TNA analysis
                         and**
Inclusion of IS knowledge in training program at Professional and sub professional officials of Bangladesh Forest Department

➢   **Intrusion of alien invasive species in Bangladesh due to trans-boundary affects: dilemma**

➢   **Way forward mechanism**

Following are the renown invasive flora available in Bangladesh also incorporated RAP 2013/06:

Ageratum conyzoides
Bidens pilosa
Caesalpinia decapetala
Chromolaena odorata
Cuscuta reflexa
Hedychium gardnerianum
Heitage benghalensis
Lantana camara
Ligustrum robustum
Mikania micrantha
Mimosa pudica
Parthenium hysterophorus
Prosopis juliflora
Saccharum spontaneum

Following names are in the RAP Publication 2013 /06 but **need to rethink are they really Invasive Species for Bangladesh**:

Casuarina equisetifolia
Dalbergia sissoo
Falcateria moluccana
Leucaena leucocephala
Melia azedarach
Spathodea campanulata

Need to add in the list as Invasive species:

Sphagneticola trilobata

Canna indica

Acacia auriculiformis

Ageratum conyzoides L.

Extensively present particularly in hill forest areas. Any fellow land is susceptible for invasion

Arundo domax

Available in hill forests. However, this has commercial value because every household use this for sweeping

Bidens pilosa L.

Present particularly in natural forest areas.
Two students reported they saw the plant.
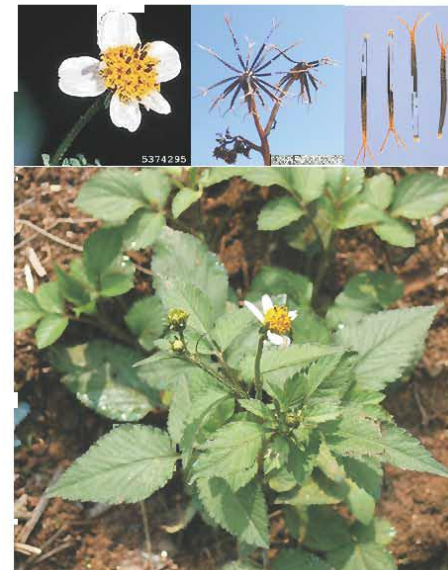
Caesalpinia decapetala

Present particularly in hill forest areas. Road
side and fellow lands are invaded easily

PC: RAP Publications 2013/06

Chromolaena odorata L.

Present particularly in natural forest areas.
Road side and fellow lands are invaded
easily . CU campus

Cuscuta reflexa Roxb.

Present particularly in natural forest areas.
In the forest boundary, sometimes it
covered the whole tree.

PC: RAP Publications 2013/06

Mikania micrantha

This is one of the major threat for our hill forest areas. In the forest boundary, sometimes it covered the whole tree retard the growth. All the parameters of the assessment tool provide a clear invasiveness about this species.

Lantana Camera

Present particularly in all hill forest areas of Bangladesh. Found at the forest boundary, road side and the vacant area in the forest .

Management protocol for *Mikania* and *Lantana*

However to eradicate the problem related to Mikania and Lantana our management team used the following technique:

These two species were cleared by weeding operation, then every day a person with a Dao (a large knife) patrolling in such a way that he can touch all the area in a week and clear any climber. This way Mikania and Lantana were 75% eradicated. However, this found good technique during rainy season, but difficult to apply because the skilled laborer are engaged in plantation program and difficult to patrol as well.

Educating BFD officials through training

Resources mobilization

- •TNA
- •Literature review
- •consultations

- •Questionnaire development
- •Module generation

Training to BFD officials

- •Final report

Submission to BFD

Reporting

Reporting

Reporting

Reporting
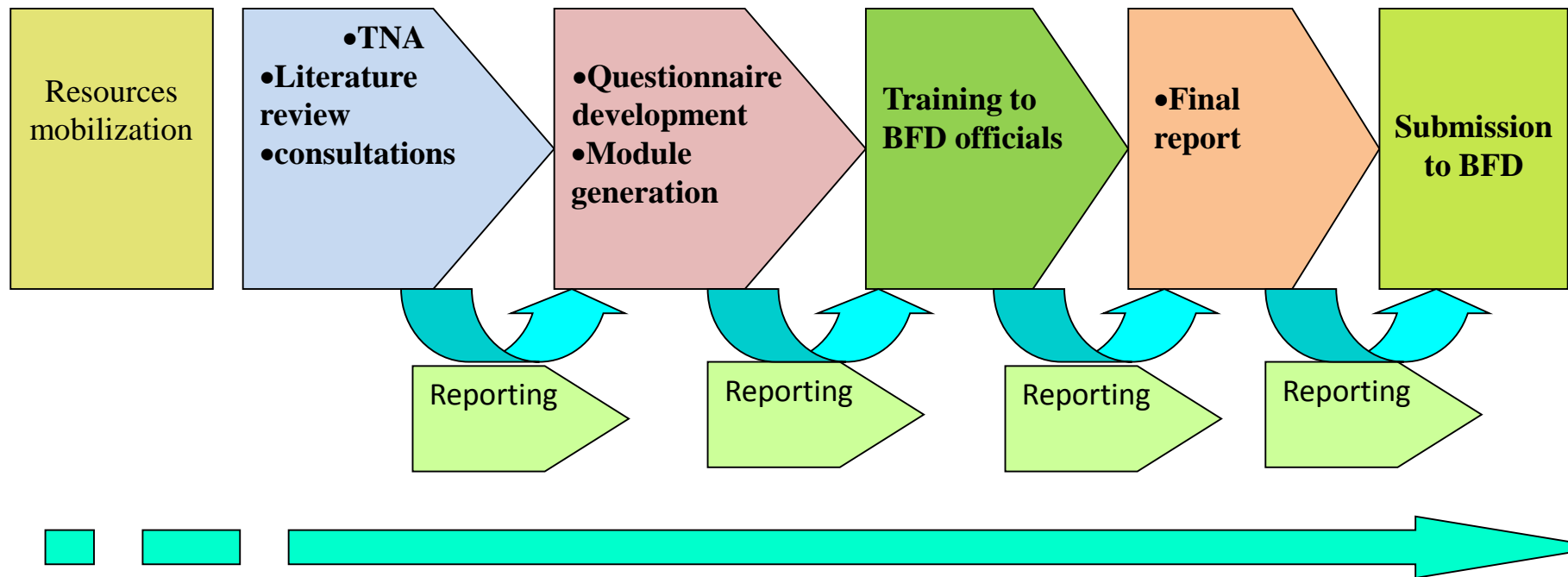
Schematic diagram of training conceptual work flow

Sankaran and Suresh (2013). RAP Publication No: 2013/ 06
Key source for the training participants on Invasive species

Asia-Pacific Forest Invasive Species Network

Invasive alien plants in the forests of Asia and the Pacific
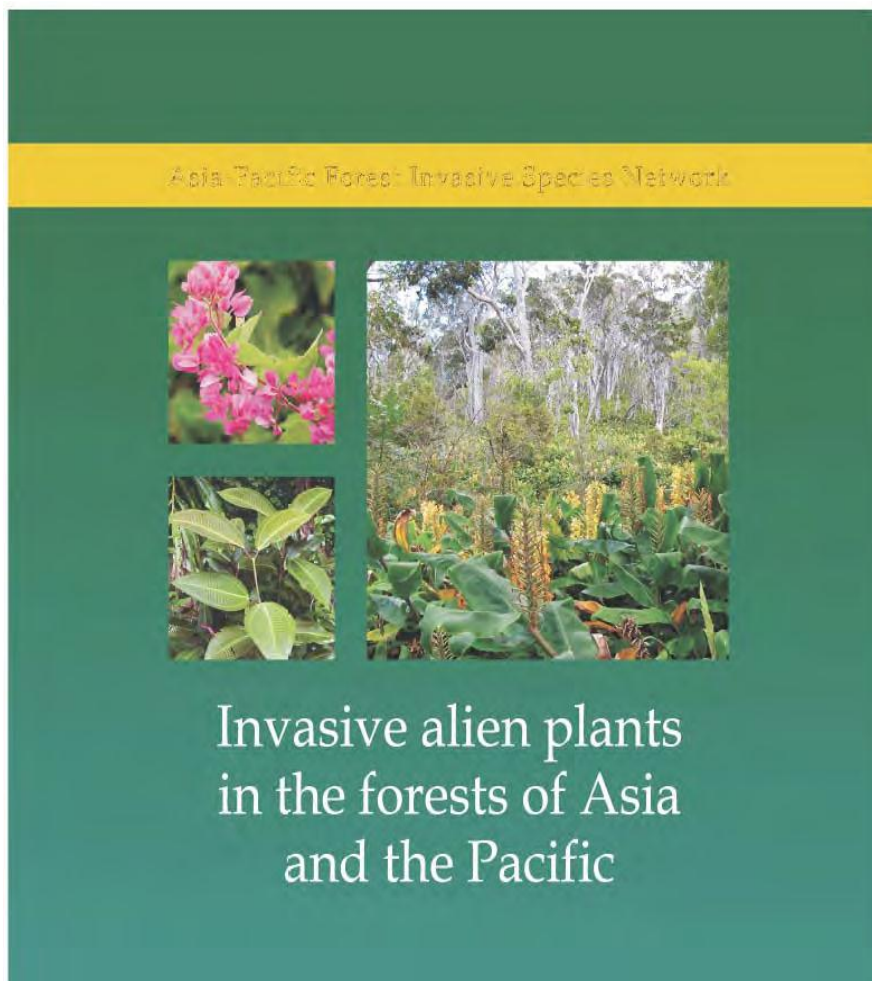
Randall et al., 2008. also a paper guide us for choosing the parameters of the protocol

Schematic diagram for TNA

```
┌─────────────────────────────────┐
│      Select Target Audience     │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│      Develop needs analysis     │
│          Questionnaire          │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│      Review needs analysis      │
│          Questionnaire          │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│   Develop structured interview  │
│             forms               │
└─────────────────────────────────┘
                 │
                 ▼
┌──────────┐  ┌──────────────────┐  ┌──────────┐
│ FOCUS    │  │ Conduct interview│  │ KEY      │
│ GROUP-   │  └──────────────────┘  │ INFORMA  │
│ DISCUSSI │          │             │ NT       │
│ ON       │          ▼             │ INTERVIE │
│          │  ┌──────────────────┐  │ W        │
│          │  │ Summarize        │  │          │
│          │  │ questionnaire and│  │          │
│          │  │ interview data   │  │          │
└──────────┘  └──────────────────┘  └──────────┘
      │               │                  │
      ▼               ▼                  ▼
┌─────────────────────────────────┐
│   Review result and draw        │
│         inferences              │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│  Develop training programme     │
│  and select the person(s) to be │
│            trained              │
└─────────────────────────────────┘
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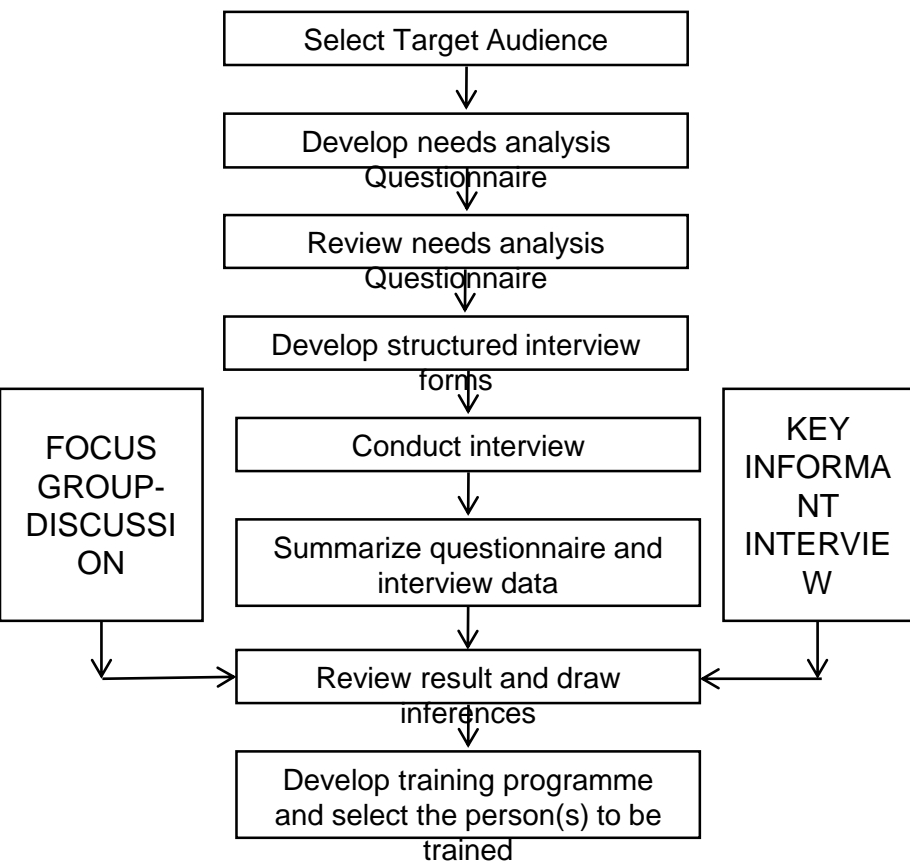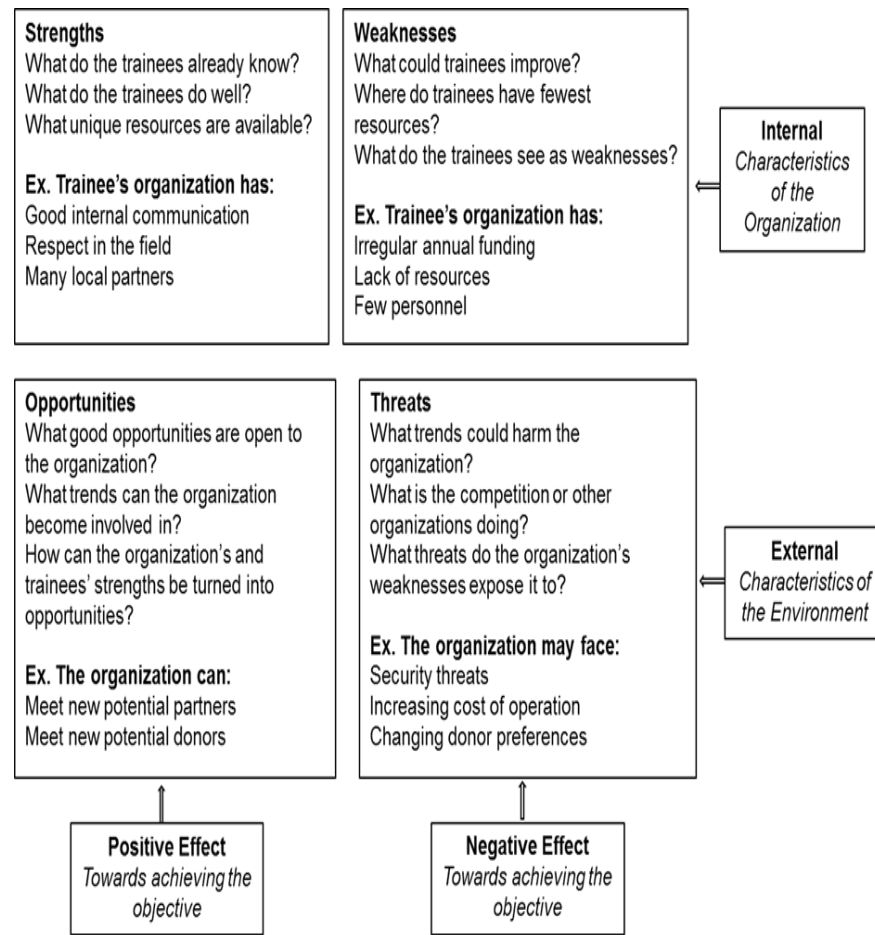
Schematic diagram for SWOT analysis

Strengths
What do the trainees already know?
What do the trainees do well?
What unique resources are available?

Ex. Trainee's organization has:
Good internal communication
Respect in the field
Many local partners

Weaknesses
What could trainees improve?
Where do trainees have fewest resources?
What do the trainees see as weaknesses?

Ex. Trainee's organization has:
Irregular annual funding
Lack of resources
Few personnel

Internal
Characteristics of the Organization

Opportunities
What good opportunities are open to the organization?
What trends can the organization become involved in?
How can the organization's and trainees' strengths be turned into opportunities?

Ex. The organization can:
Meet new potential partners
Meet new potential donors

Threats
What trends could harm the organization?
What is the competition or other organizations doing?
What threats do the organization's weaknesses expose it to?

Ex. The organization may face:
Security threats
Increasing cost of operation
Changing donor preferences

External
Characteristics of the Environment

Positive Effect
Towards achieving the objective

Negative Effect
Towards achieving the objective

Conducted trainings of BFD officials:

Batch No.	Date of Training conduction	Assistant Conservator of Forest (ACF)	Ranger	Accountant	Foresters	Forest Guard	Total
1	23-27 Oct,2016	1	8		16	0	25
2	23-27 Oct, 2016	0	0		23	0	23
3	30 Oct-03Nov, 2016	0	10		15	0	25
4	30 Oct-03 Nov, 2016	0	0		24	0	24
5	06 -10 Nov,2016	0	8		14	0	22
6	06-10 Nov, 2016	0	0		23	0	23
7	13-17 Nov, 2016	1	8		15	0	24
8	13-17 Nov,2016	0	0		25	0	25
9	20-24 Nov, 2016	0	11		15	0	26
10	20-24 Nov,2016	0	0		25	0	25
11	27 Nov-01 Dec,2016	0	2	1	21	0	24
12	27 Nov-01 Dec, 2016	0	0		21	0	21
13	04-08 Dec, 2916	0	0		0	24	24
14	11-15 Dec, 2016	0	0		0	26	26
15	18-22 December, 2016	0	0		0	24	24
16	18-22 December, 2016	0	0	0	0	19	19
	Total	2	47	1	237	93	380

BFD Officials Trained
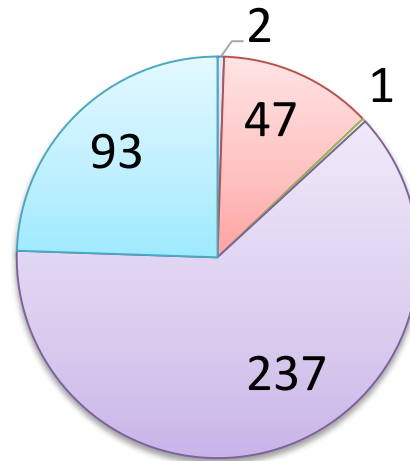
Conducting training of BFD officials

Intrusion of alien invasive species in Bangladesh due to trans-boundary affects: dilemma

A study was designed to find the trans-boundary effects particularly on Myanmar and Bangladesh (at Teknaf river port)

Data was collected but in the revisit time Human invasion (Rohynga from Myanmar) not only threat about invasive flora and fauna but also a total threat both to hill and coastal forest area of Bangladesh.

Of course, Government of Bangladesh took this humanitarian ground but the opportunity cost is huge forest area are destroying

Rohinga from Myanmar staying at Forests

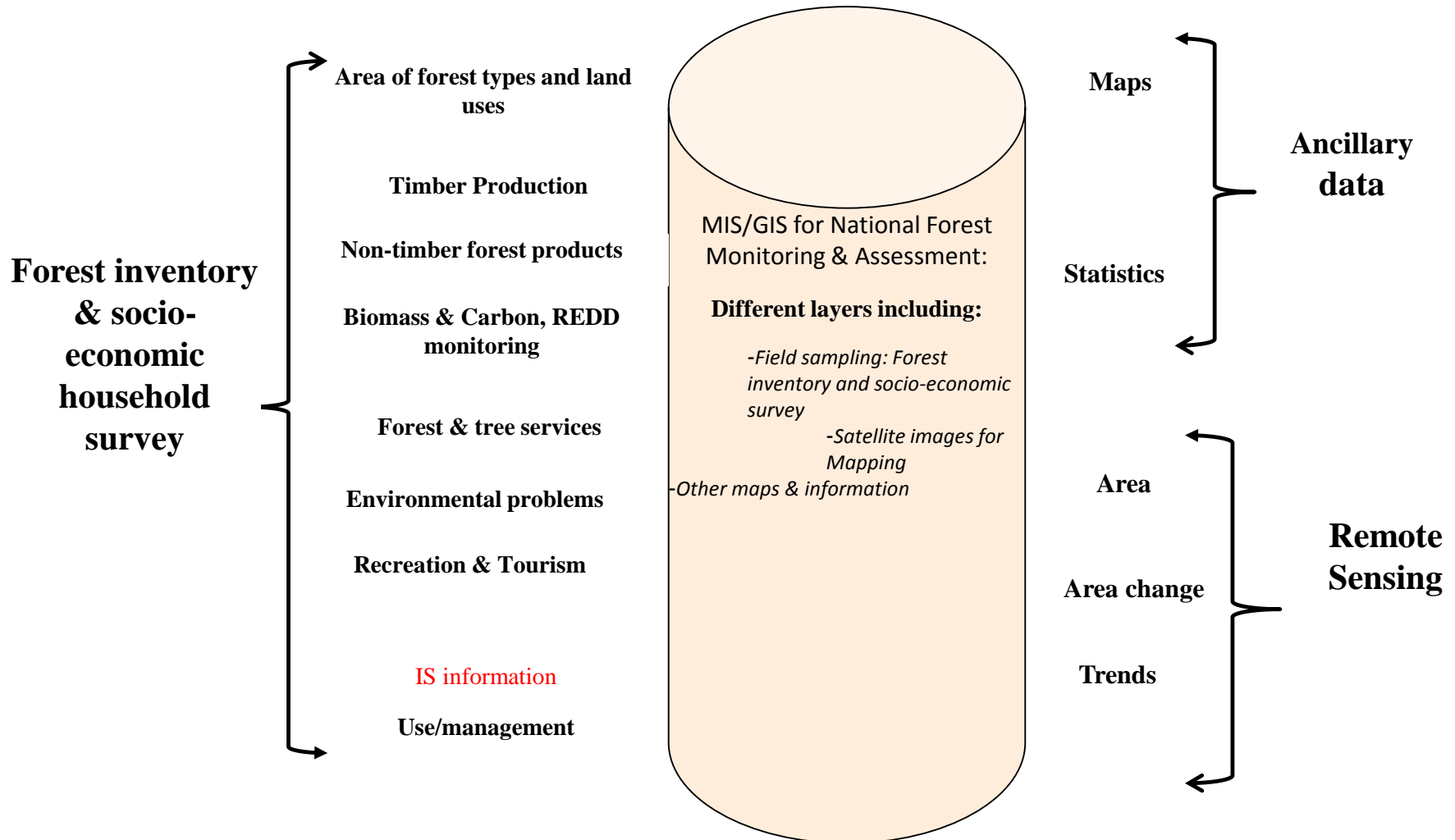Rohinga from Myanmar staying at Forests

Deforestation at present

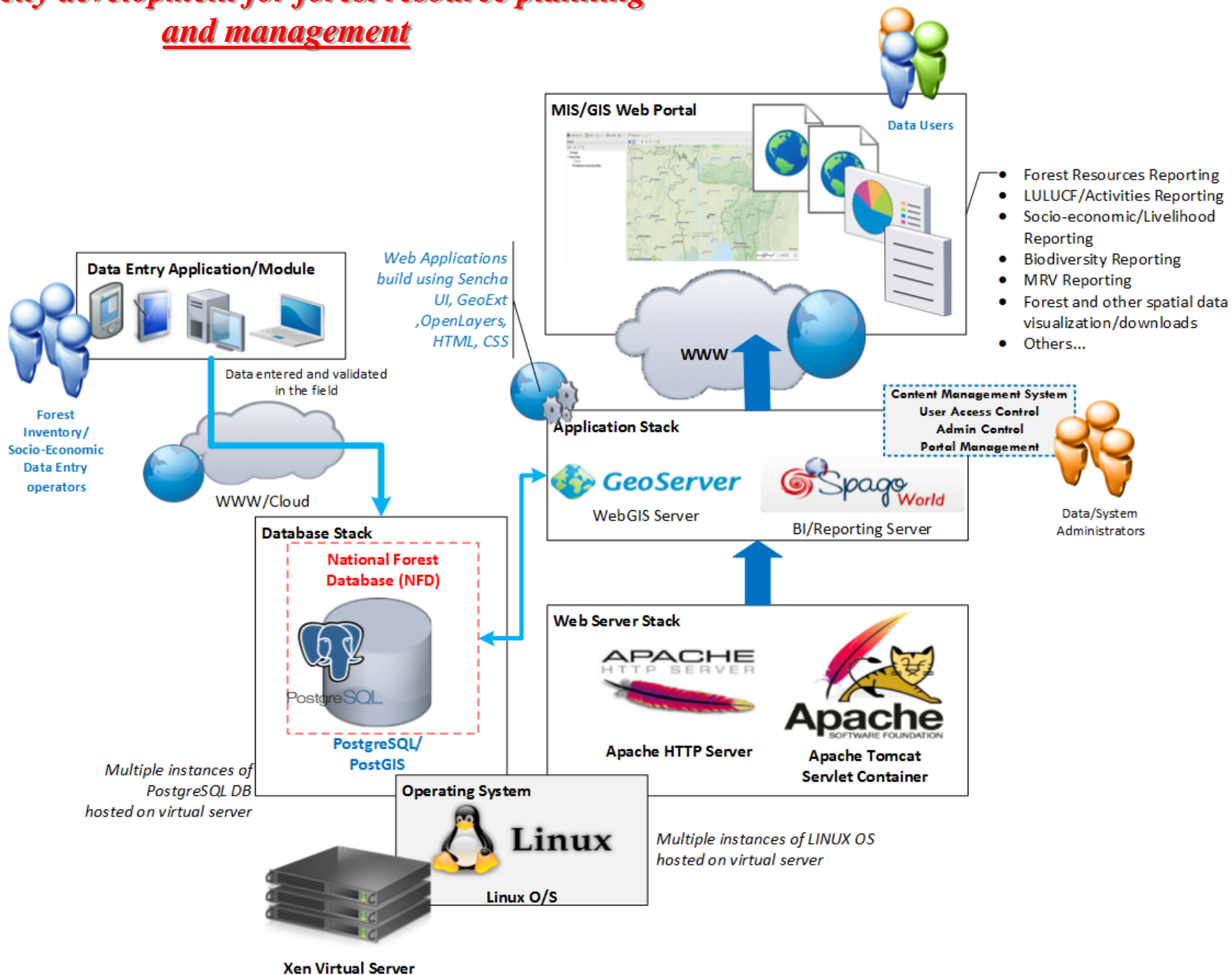# Recent advancements where IAS protocol and management need to be inducted

The Government focused their efforts and combat the situations with following steps:

❖*Afforestation and reforestation program*, aiming to -increase the afforested/reforested areas through **participatory forestry and co-management approach may be with REDD+ initiatives** in the degraded coastal and hilly areas;

❖*Alternative livelihoods to support forest communities* -aiming to **diversify non forest-based livelihood opportunities** of selected poor forest dependent households;

❖*Capacity development* for **forest resource planning and management**

Capacity development for forest resource planning and management

Forest inventory & socio-economic household survey

- Area of forest types and land uses
- Timber Production
- Non-timber forest products
- Biomass & Carbon, REDD monitoring
- Forest & tree services
- Environmental problems
- Recreation & Tourism
- IS information
- Use/management

MIS/GIS for National Forest Monitoring & Assessment:

Different layers including:

-*Field sampling: Forest inventory and socio-economic survey*
-*Satellite images for Mapping*
-*Other maps & information*

Ancillary data
- Maps
- Statistics

Remote Sensing
- Area
- Area change
- Trends

**THANKS A LOT
FOR YOUR KIND
ATTENTION**