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# Epidemiology, Surveillance, Diagnosis, Control and Prevention of PPR: Bangladesh Perspective

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# Susceptible populations for PPR in Bangladesh

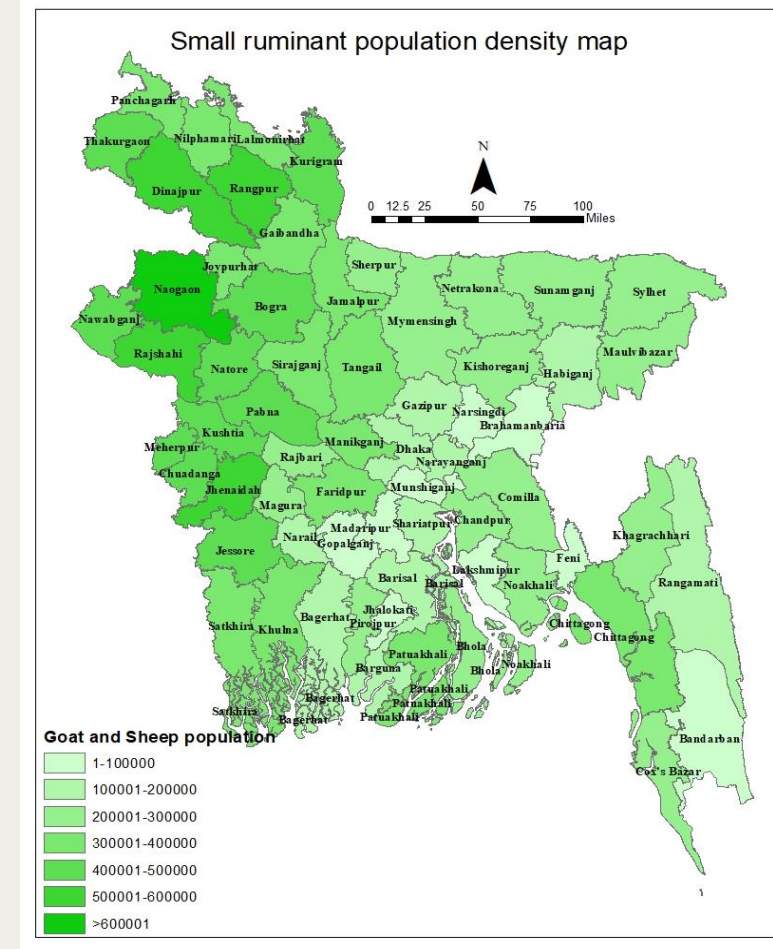
## Small ruminants (SR)

- Goat: 26.94 million
- Sheep: 3.83 million
- Goat represents 47.15% of the total ruminant populations in Bangladesh.



## Wild SR - 0.12 million (approx.)

- Deer (approx. 83 thousand)
- Gazelles and
- Others



# Disease prevention and control system(s): Vaccination and Surveillance

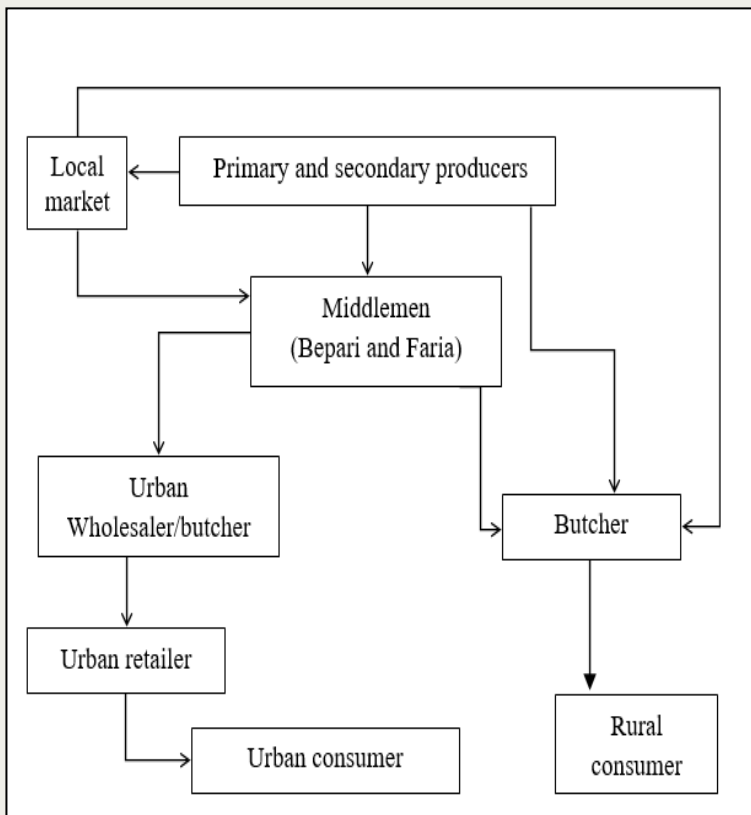
- Regular vaccination at field level (vaccines are produced by LRI under DLS, Bangladesh)
- Mass vaccination (vaccines are imported)
  - In 2023-2024 fiscal year, 25 million doses of PPR vaccine was imported.
  - In a mass vaccination program of 2023 (30/09/2023 to 12/10/2023) arranged by a project of DLS, a total of 27.50 million doses of PPR vaccine was administered.



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**LRI: Livestock Research Institute under DLS, Bangladesh responsible for vaccine production**  
**DLS: Department of Livestock Services in Bangladesh responsible for livestock production**

## Risk pathways for PPR introduction in Bangladesh



1

Shortage of quality and adequate vaccine

3

Animal movement during festival (4.9 million goat & sheep slaughtered during last eidul azha)

2

Introduction of unvaccinated animals into farm

4

Soiled (mud) floor

3

Intermingle of animals (market place/grazing land)

5

Selling of infected goats

PPR is one of the major threats to small ruminants because-

- Bangladesh has porous borders with India (23)
- Risk for transboundary disease transmission



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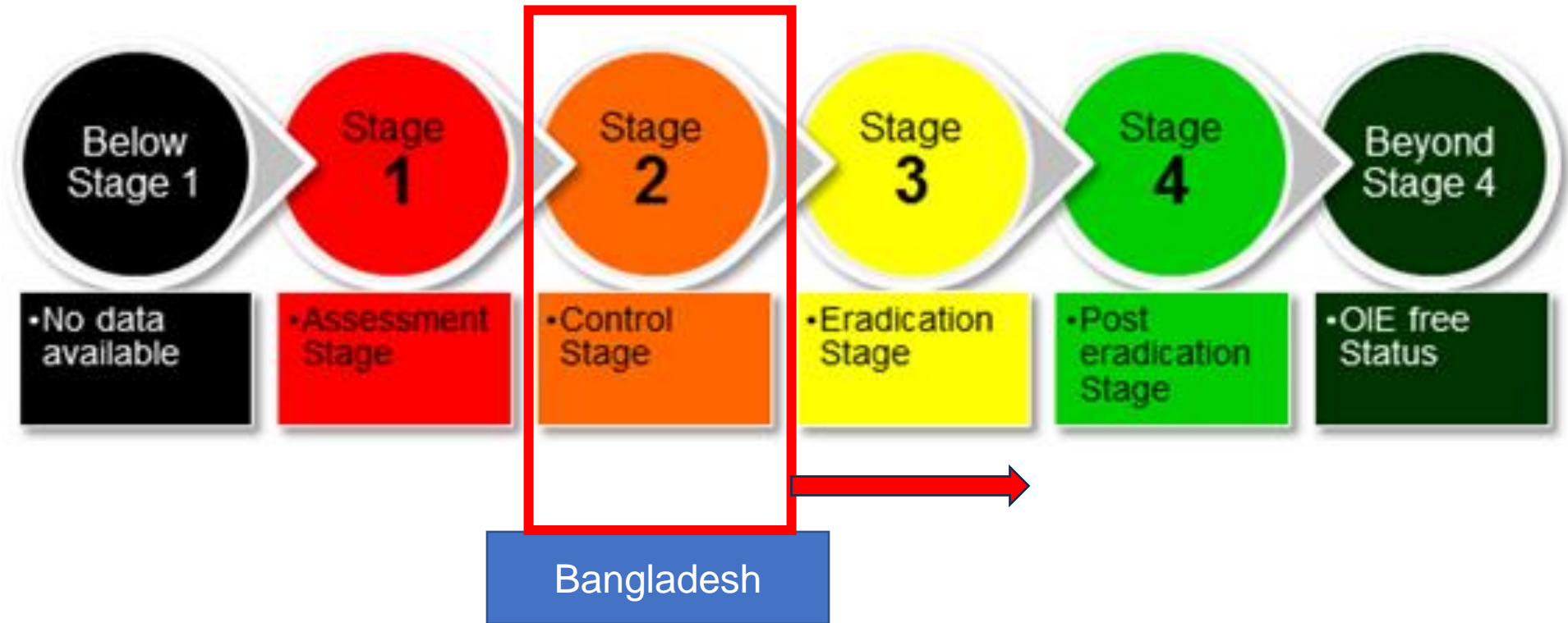
## Disease Situation

- ✓ **First outbreak** of PPR in Bangladesh: **in 1993** in Meherpur district, southwestern part of the country
- ✓ **Number 1 economic important viral disease** of goats and sheep in Bangladesh.
- ✓ PPR was top of the disease prioritization list in 2018.
- ✓ At present, PPR in Bangladesh is measured to be **endemic**.
- ✓ A complete prevalence associated with PPR in goats was seemed to **be 8.99%** (Parvez et al., 2014).
- ✓ Passive data analysis of DLS data showed a prevalence of PPR in Bangladesh as **14.68%** (Mondal and Yamage, 2014).
- ✓ **Morbidity and mortality reach up to 100%, 50-90% respectively.**
- ✓ Severe economic losses (**24.6 million USD annually**).





# Disease Situation: Where Bangladesh is



- Based on the country's self-assessment using the PPR Monitoring and Assessment Tool (PMAT), Bangladesh holds the position of Stage 2 in the Global Control and Eradication Strategy (GCES) of PPR.
- Bangladesh continues towards reaching Stage 3 (Eradication stage).



# Existing Laboratory Capacities and activities

- Ic- ELISA
- (c-ELISA)
- Virus isolation
- RT-PCR, rRT-PCR
- Sequencing

## Surveillance system

	Passive surveillance	BAHIS	<ul style="list-style-type: none"> <li>• Day to day basis</li> <li>• Patient registry</li> <li>• 50% subdistricts successfully transfer the data</li> </ul>
	Active surveillance	DLS-Project	<ul style="list-style-type: none"> <li>• Sero-surveillance as a part of mass vaccination monitoring</li> </ul>

- BLRI
- CDIL (1)
- FDILs (9)
- Different Uni. Lab & NIB

- Lab. staff from
- CDIL & FDILs
  - field veterinarians

**LRI**  
Producing 10 millions PPR vaccine per year

**2.3.1 Laboratory diagnostic system**

**2.3.3.2 Training on PPR diagnostic assay**

CDIL: Central Disease Investigation Lab.  
FDIL: Field Disease Investigation Lab  
LRI: Livestock Research Institute

Based on RBSP (Draft), Bangladesh is implementing control activities (Stage 2)

Vaccine production increase

At present around 10 million doses produced

# Mass vaccination throughout the country

# Vaccine supplied to the field level using cool-chain

# Awareness creation and farmers motivational program through training and FFDs

# Mass vaccination campaign found to be more effective

# PPR confirmed cases nearly zero

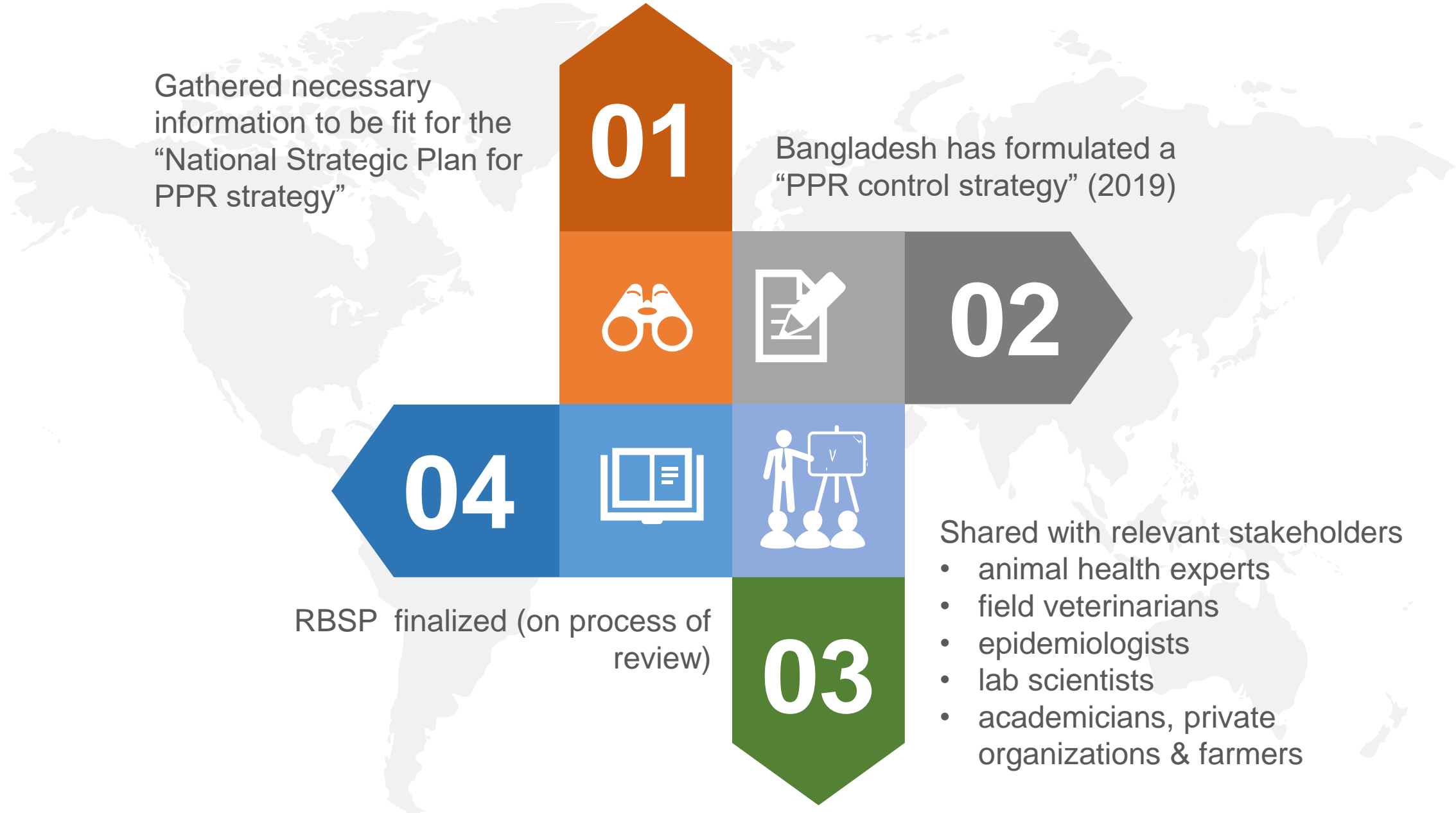
**Support to vaccine production lab:**  
Resources given for vaccine production labs:- chemicals, consumable, appliances and staff  
**Support diagnostic lab (CDIL):** test kits

Mass vaccination done through PPP approach

- Involvement of local representatives
- Farmers
- DLS local offices

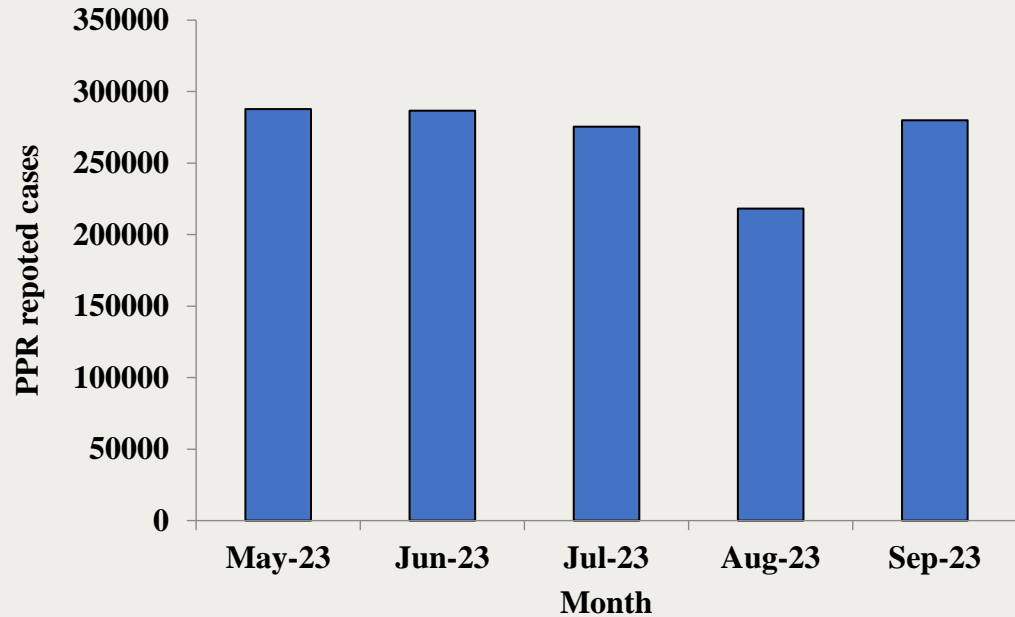


# PPR strategic plan formulation in Bangladesh



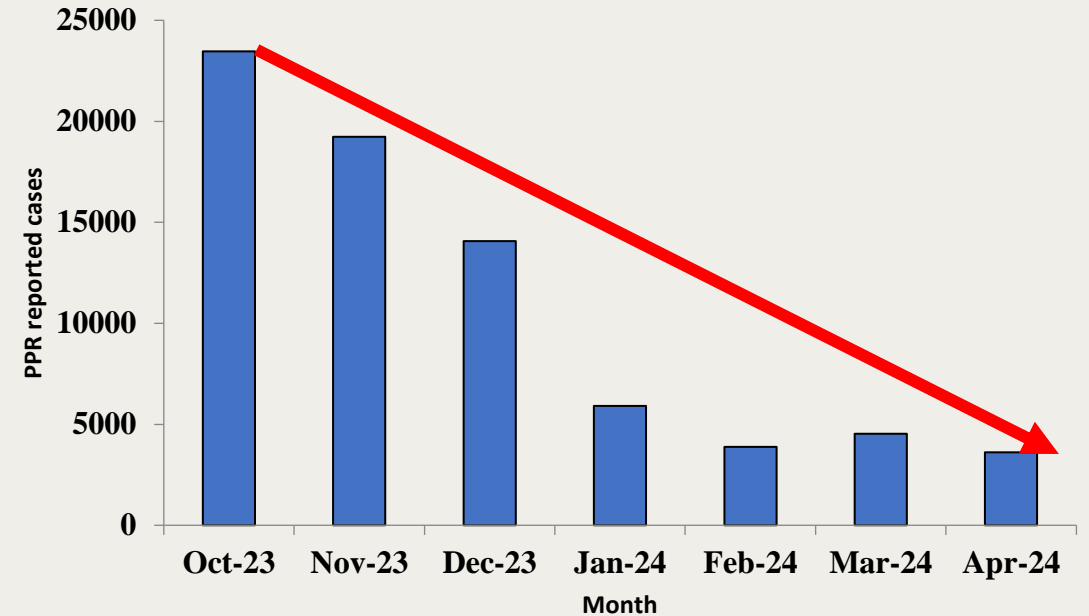
# Prevention and control measures: Mass vaccination outputs

## Monthly PPR reported cases in 2023



### Before Mass Vaccination

## Monthly PPR reported cases in 2023-24

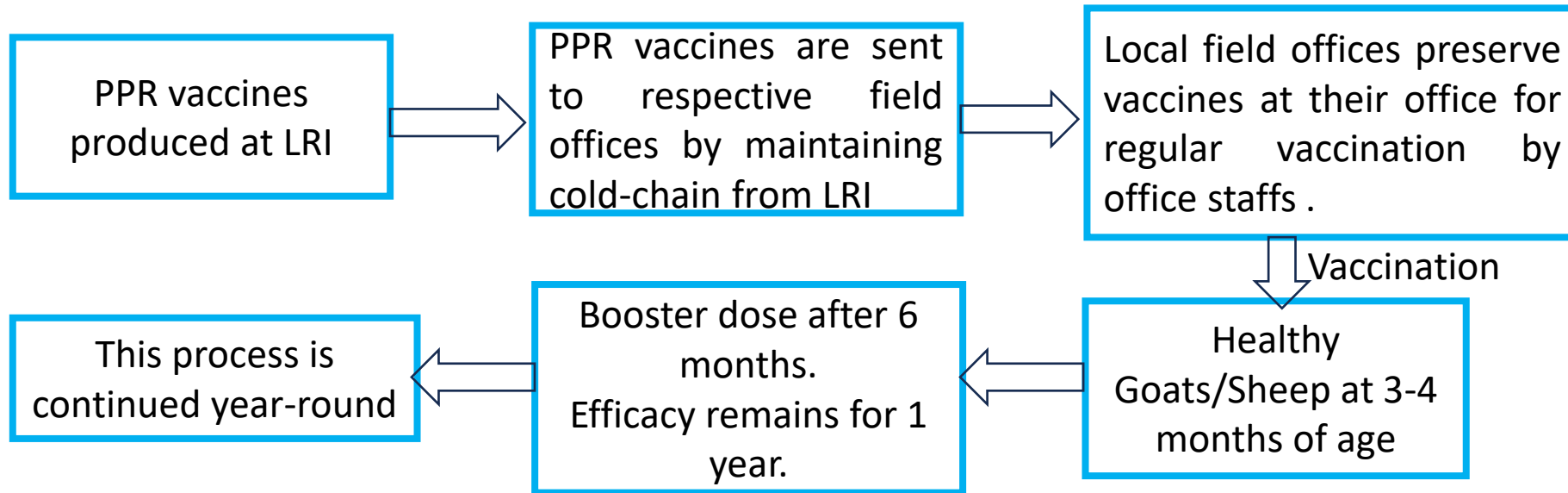


### After Mass Vaccination

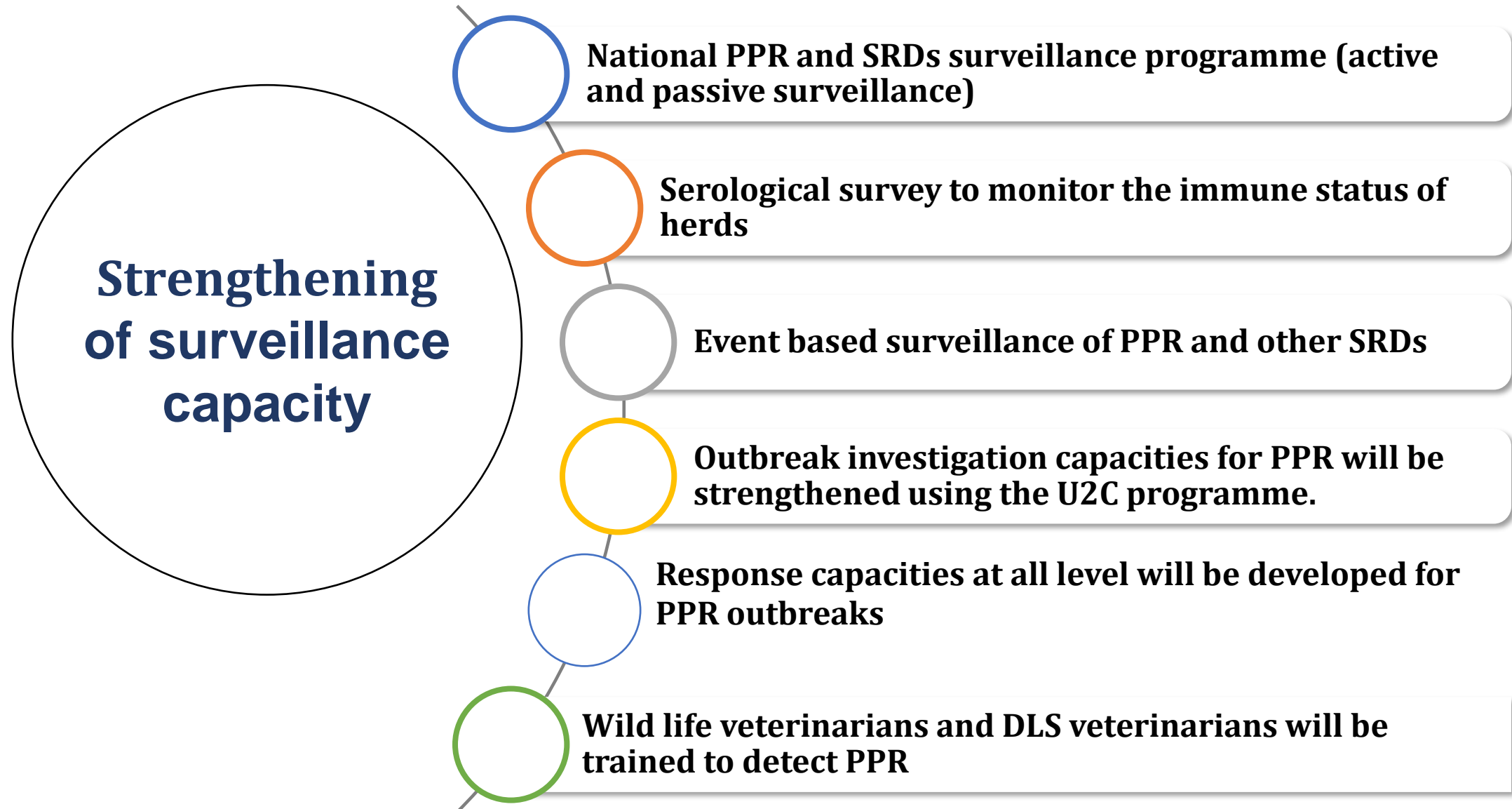
- Mass vaccination overall in Bangladesh at a time in all sheep and goats by 12 days indicates a gradual decrease in the PPR incidence rate.
- Bangladesh has a shortage in capacity of the total required vaccine production.



## PPR vaccination strategy



- DIVA vaccination is not yet practiced in Bangladesh.
- There is a plan for establishing the 'PPR specific Laboratory' and 'PPR surveillance' and 'database software development for vaccination of PPR' under PPR eradication project.



# Surveillance

## Surveillance system

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Passive surveillance	BAHIS	<ul style="list-style-type: none"><li>• Day to day basis</li><li>• Patient registry (Local office based)</li><li>• Currently 50% of subdistricts are able to successfully transfer the data</li></ul>
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Active surveillance	DLS Project	<ul style="list-style-type: none"><li>• Sero-surveillance as a part of mass vaccination monitoring</li></ul>
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Challenges and any other issues:

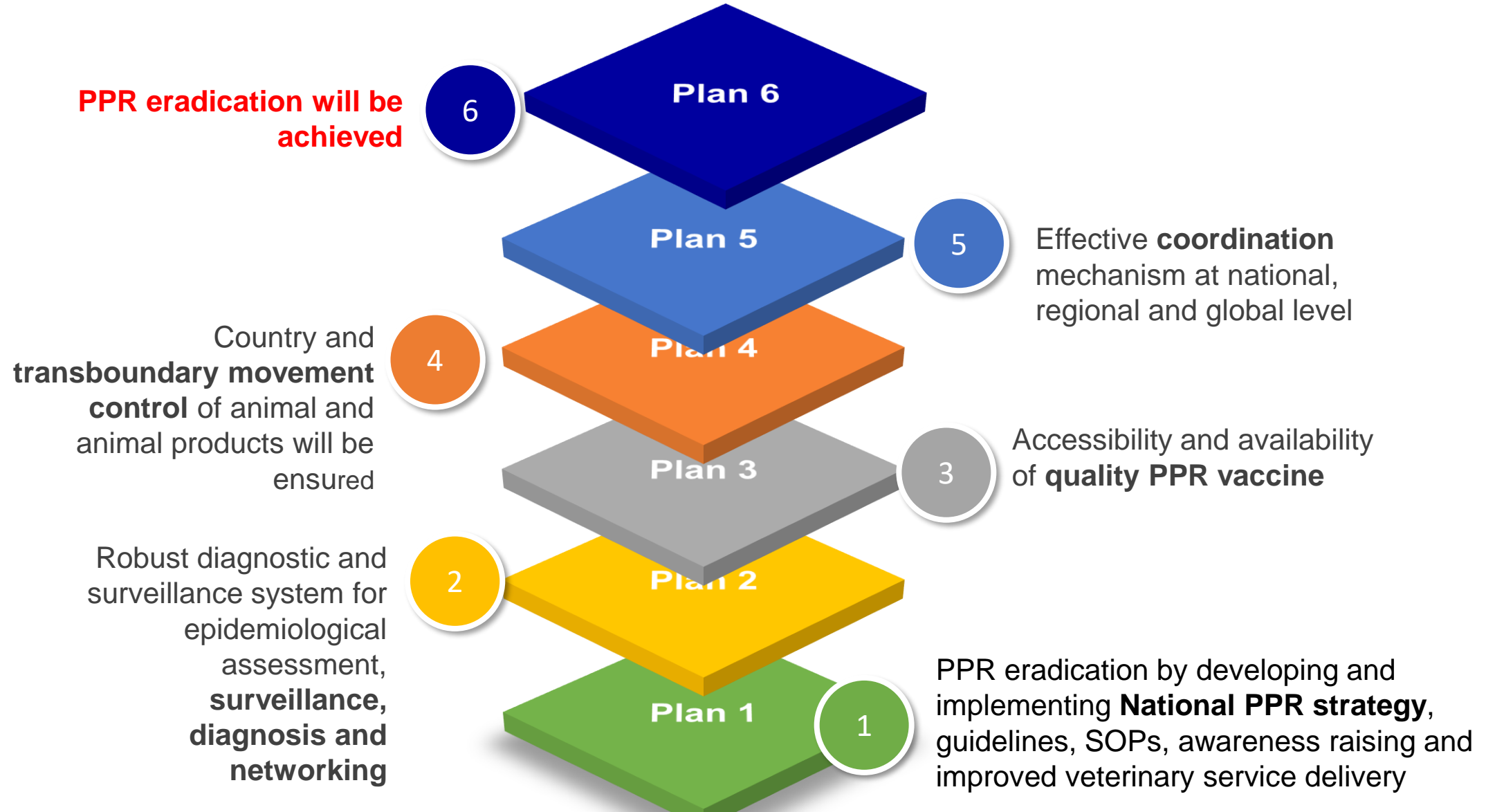
- Cubersome rapid diagnostic facilities for PPR control.
- At present only 10 millions of vaccines are produced by LRI against 26.94 million goats and 3.83 million sheep
- **Its only 32.49% of demand for one dose vaccine per animal per year.**
- Vaccine production infrastructure is limited.
- Raw materials, Cold chain maintenance materials, skilled personnel etc. are limited.
- Farmers willingness to vaccinate as a prevention tool
- Highest shortage of field personnel for a successful vaccination program.



- Development of a robust diagnostic and surveillance system by improving the capacity for epidemiological assessment, surveillance, diagnosis and networking.
- All susceptible animals should be vaccinated with PPR vaccine in regular interval
- To ensure accessibility and availability of quality PPR vaccine and implement vaccination program for achieving the desired level of herd immunity.
- Cross border approach - A regional data sharing network for early warning and response, strengthening quarantine stations with adequate skilled manpower and logistic support, development of vaccination calendar for boarder area vaccination
- The Epidemiology unit of DLS needs adequate logistic support for monitoring of the disease situation and outbreak investigation .
- Suspected PPR case reporting should be mandatory through BAHIS.



# Future Plans



*future plan on PPR prevention, control and eradication.*

- **Legal framework**

- Bangladesh Diseases of Animal Act, 2005 and Animal Diseases Rules, 2008 and Bangladesh Animal and Animal Product Quarantine Act, 2005 will be enforced for reporting of the disease, the declaration of infected area, movement control, transportation, compulsory vaccination, etc.

- **Stakeholder awareness and engagement**

- A PPR communication plan for raising awareness on PPR will be developed.

- **Strengthening veterinary services**

- **Epidemiological assessment**

- **Strengthening of Laboratory and Surveillance Capacities**

- **Laboratory Networks**

- A network of laboratories within the country (public, private and academic) and outside will be developed



- National Reference Laboratory for PPR shall maintain master seed of PPR along with Livestock Research Institute (LRI), DLS.
- LRI will maintain working seed for the production of PPR vaccine.
- The capacity of PPR vaccine production will be fully utilized and steps will be taken to augment the production capacity providing adequate manpower.
- The quality control section will enforce quality control rigorously to ensure the quality of each batch of vaccines dispatched from the laboratory for field use..
- In cases where this guarantee is not available, independent quality control of the vaccine should be done before mass utilization. Institutions such as BLRI, Savar, Dhaka have the mandate to carry out this independent quality control.
- Vaccine from manufacturers producing vaccines following OIE standards will be imported to meet the deficit for conducting mass vaccination Program for the country.



- Maintain the cool chain of vaccines and vaccine storage capacities at Upazila .
- Cohorts of Community Animal Health Workers (CAHW) will be developed vaccination of PPR and other SRDs.
- Regular sero-monitoring will be carried out among representative samples from the immunized herd by the National Reference Laboratory in close collaboration of epidemiology unit of Department of Livestock Services, CDIL and the regional and peripheral laboratories to assess the herd immunity.
- Capacities will be developed for conducting serological test at regional laboratories and staff will be trained for conduct serological test.



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**Thank you!**

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