



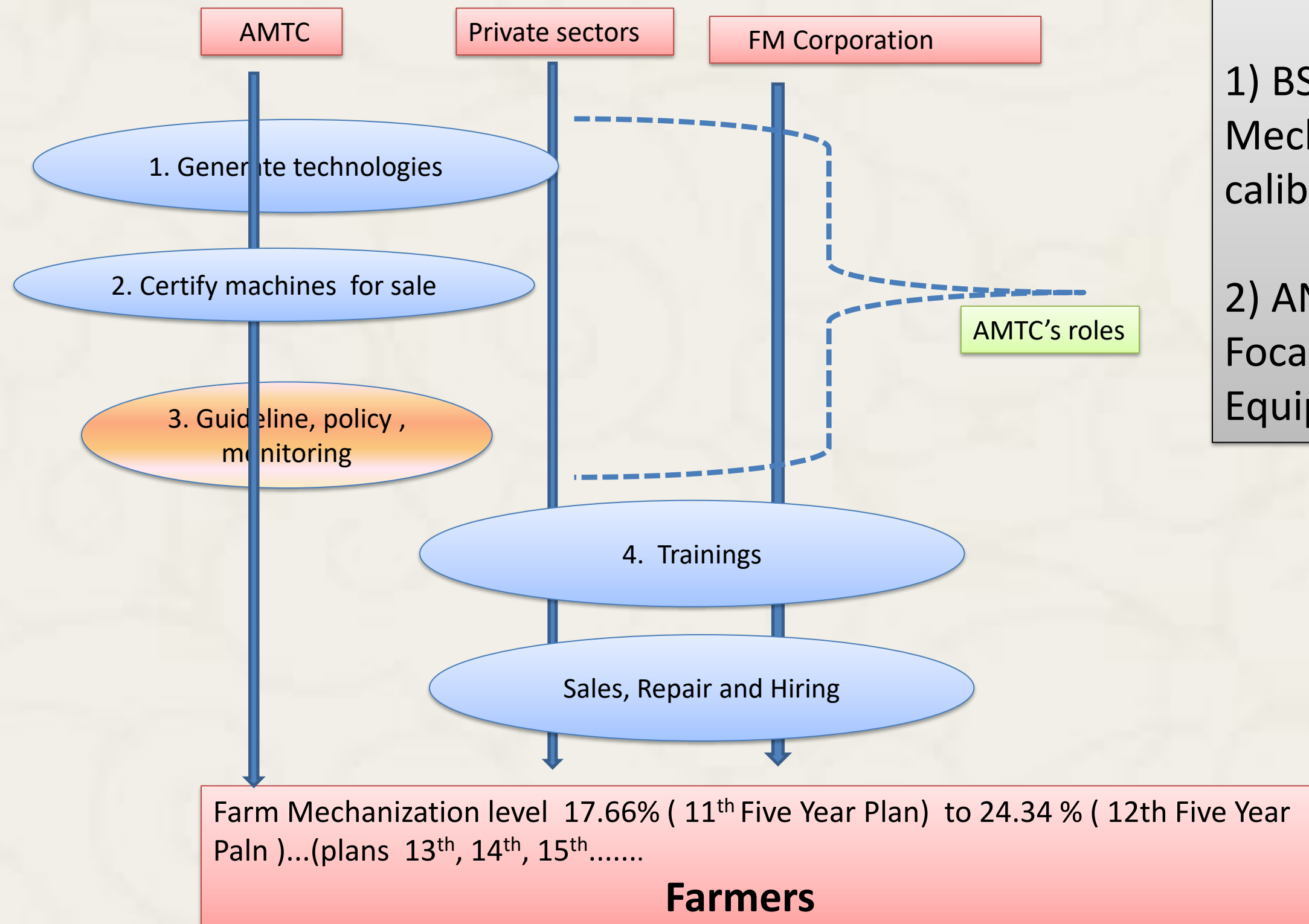
Standardization for Agricultural Machinery in Bhutan



Sangay Lhendup, Principal Engineer, Agriculture Machinery and Technology Centre



Background on Farm Mechanization in Bhutan



Linkages:

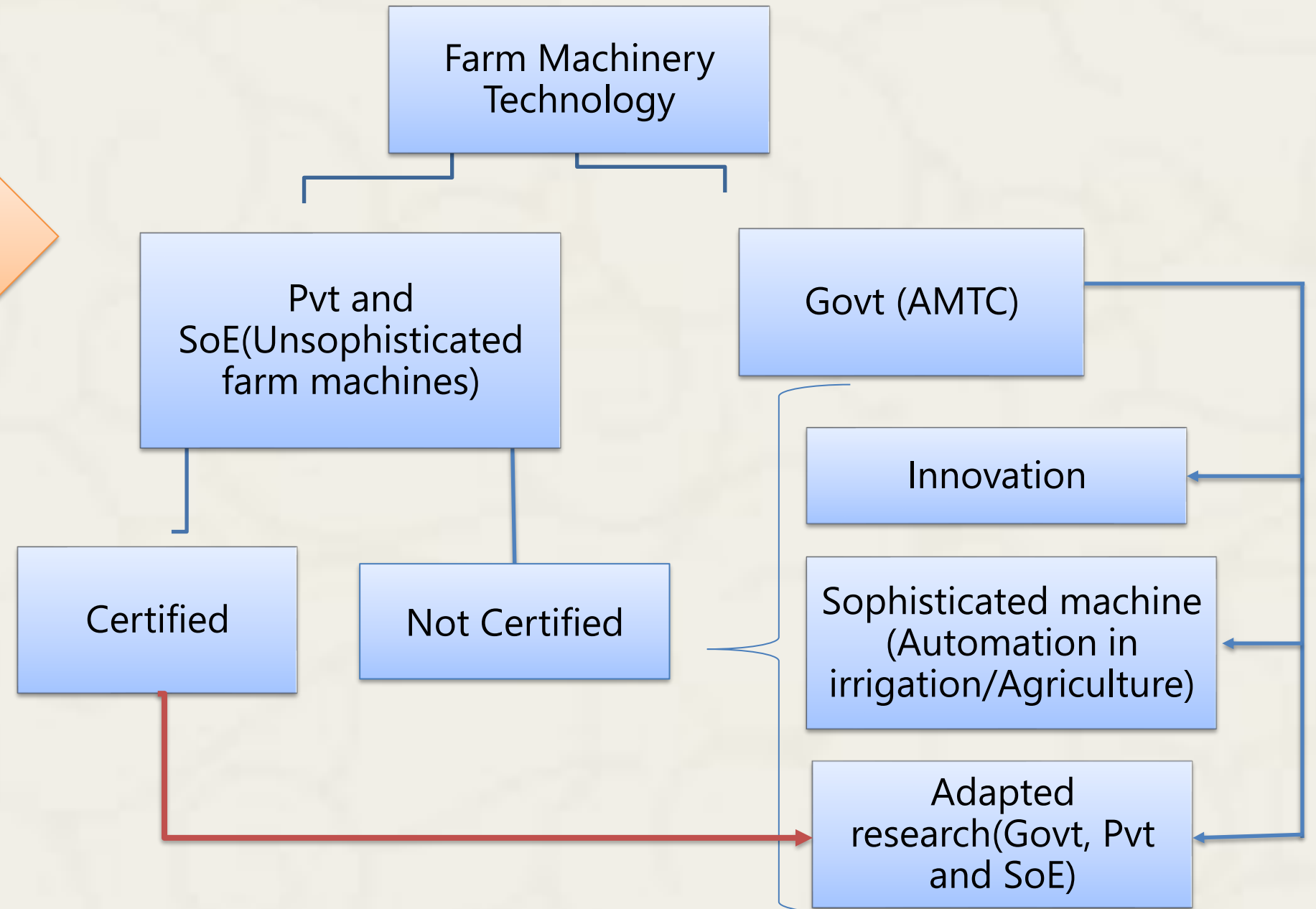
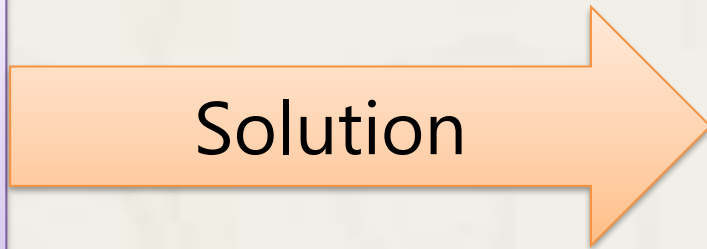
- 1) BSB, Bhutan, TC-08 members, Mechanical Engineering, calibration; Accreditation?
- 2) ANTAM, TWG members, National Focal Point, Facilities sharing?, Equipment specification?,



1. Generate efficient farm mechanization technology through innovation, adoption, adaption (precision farming, farm power & post harvest technologies).
2. Ensure safe and efficient use of farm machinery

Challenges faced in Agriculture

1. Labour shortage
2. Drudgery
3. Poor Productivity (due to various reasons)
4. Expensive



Benefits:

1. Farmers will get efficient and affordable machines.
2. Pvt and SoE don't have to spend time and resources to conduct research.



2. Generate and regulate farm mechanization services' standards

Objective : **Ensure safe, quality machines' use for price paid**

a. Standardization and Guidelines approval from National, BSB (TC-08) and Ministry Level, MoAL

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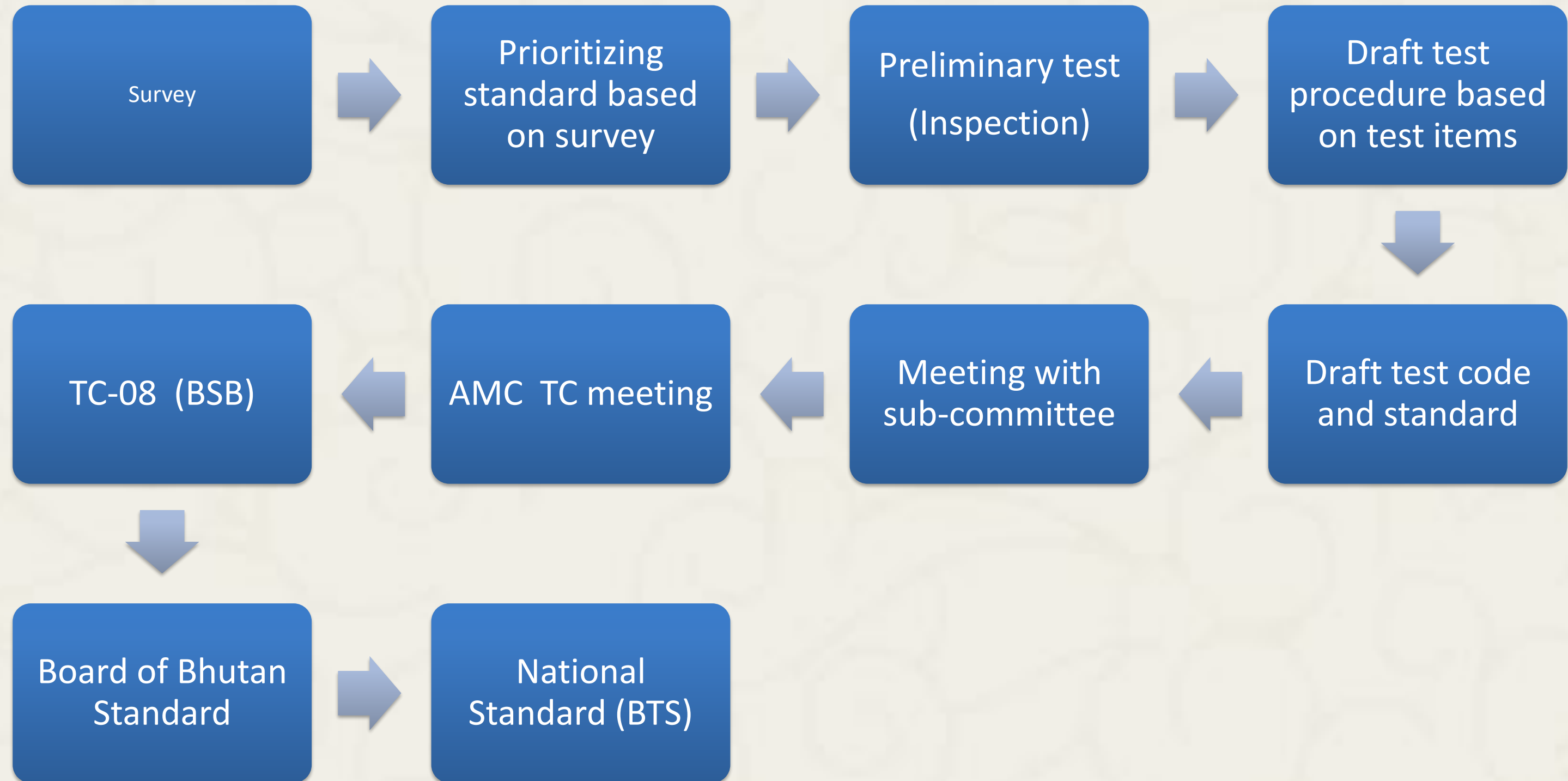
b. Testing and Test Report/Result, Certificates

c. Awareness, advocacy on the test results

Testing :-Fields and Laboratory.



Farm Machinery Standardization Process

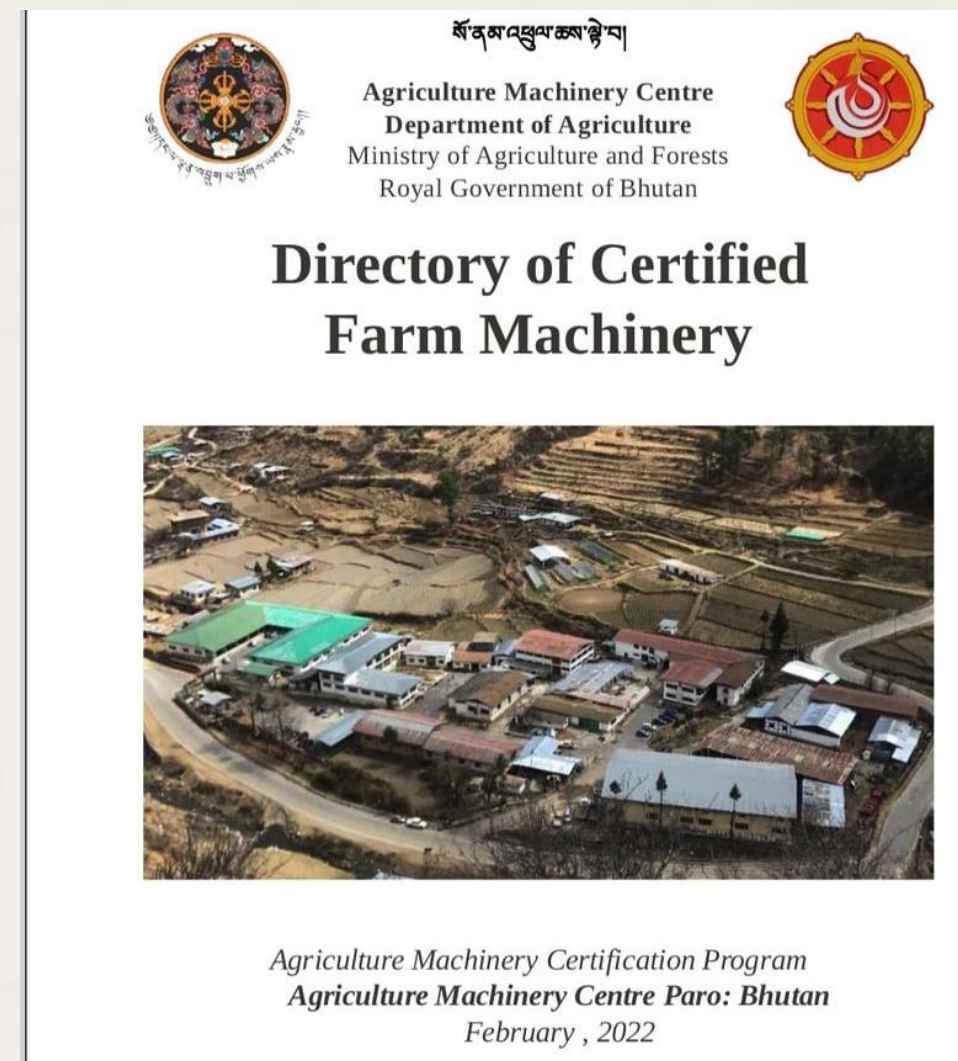




Certification Program



- Total of 10 standards at National Level from 20 standards (10 Ministry Level Standards)
- 63 different model of farm machines tested based on standards (6PT, 29MT, etc.....)
- Certificates issued to 53 models





National Level Standards and Test Codes {Bhutan Standards Bureau}:

(1) Power tiller, (2) Power reaper, (3) Rice mill, (4) Cereal Flaking machine, (5) Mini tiller, (6) Grain mill/Flour mill, (7) Portable brush cutter, (8) Tractor, (9) Knapsack sprayer and (10) Polyethelene green house



Minimum Requirements, Basic Safety requirement, Performance requirement





Power Tiller: Test Items and Facilities



1. Verification of structure and specification
2. Safety Requirement
3. Sound Test
4. Vibration Test
5. Engine Test
6. Operation Field Test
7. Parking Test
8. Service Braking Test
9. Waterproof Test

Sound Meter

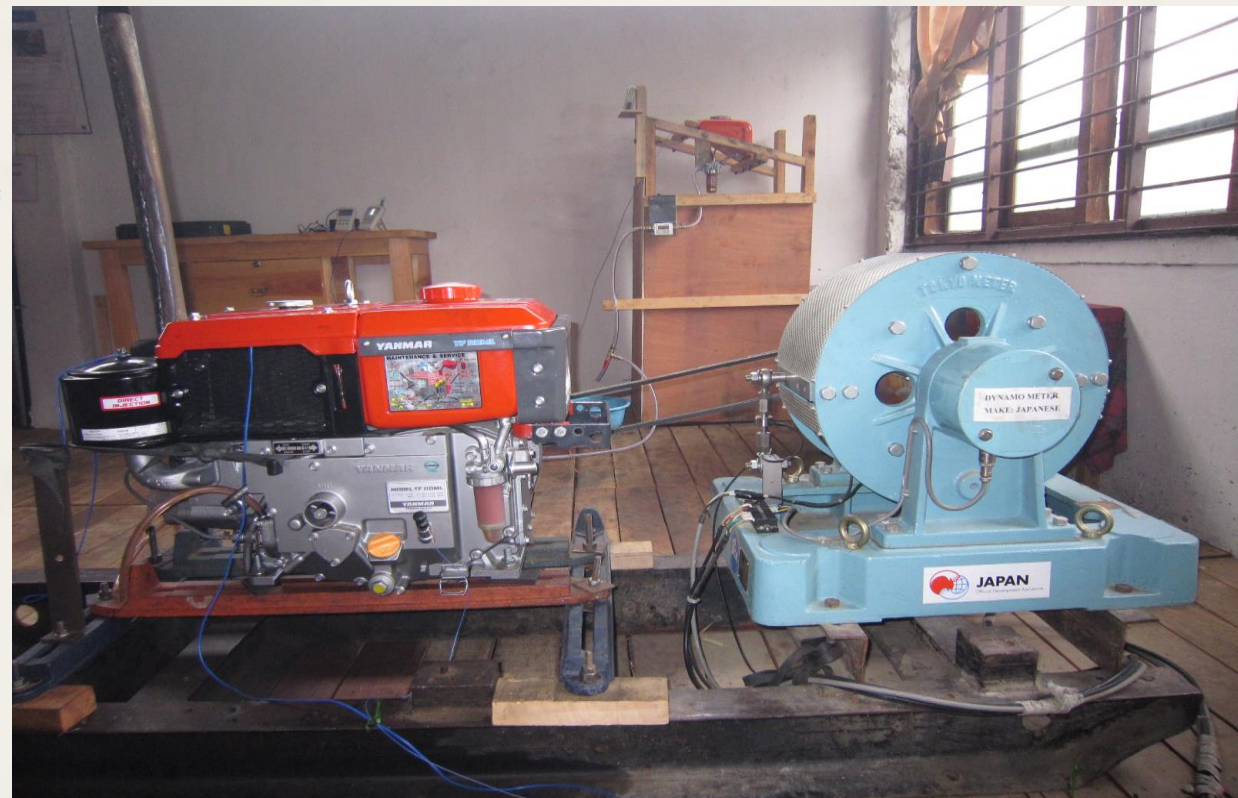
Vibration Meter



Sound Test in Field



Vibration Test in Field



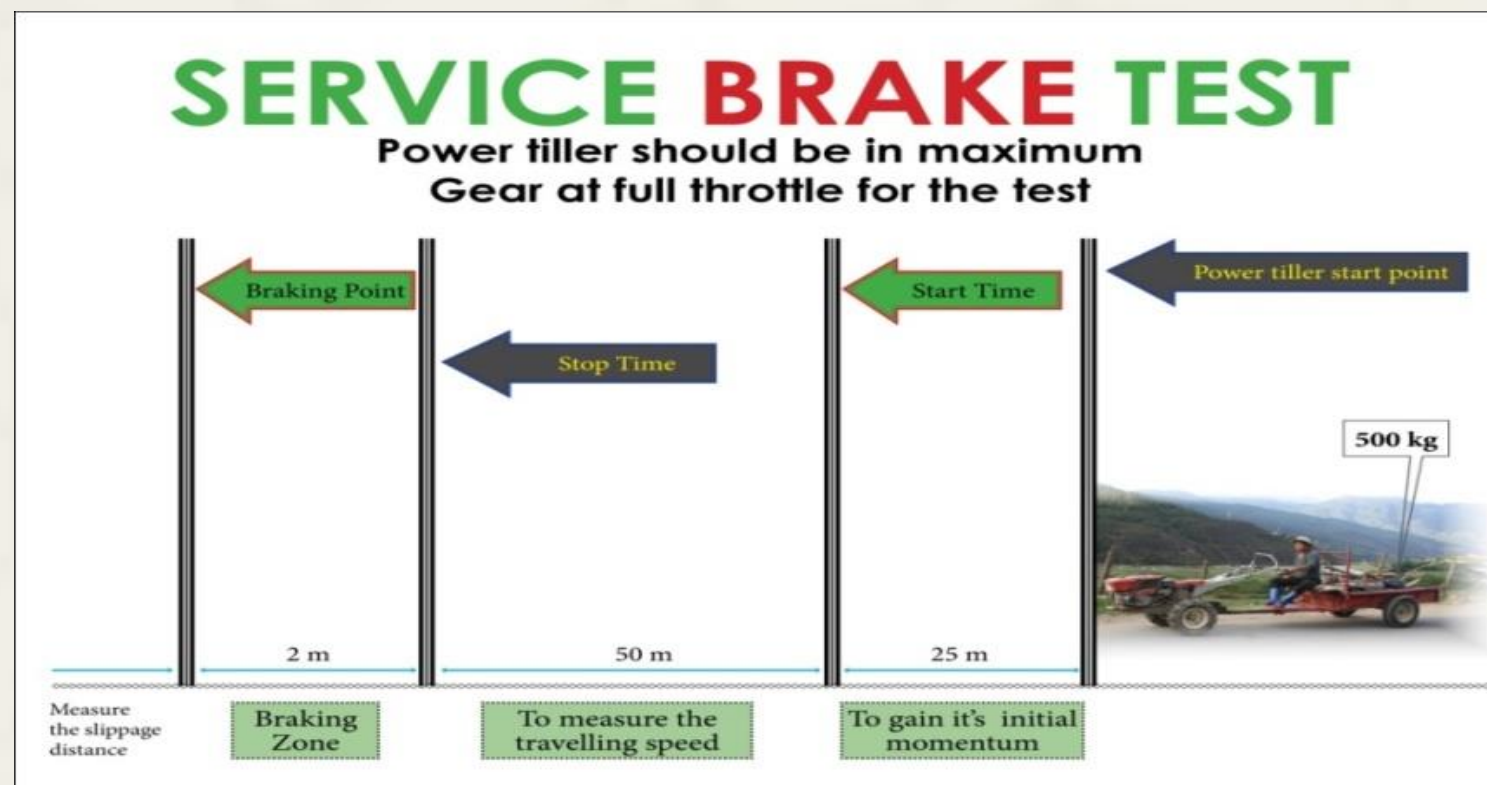
Engine Test



Waterproof Test



Service Brake Test



Facilities:-

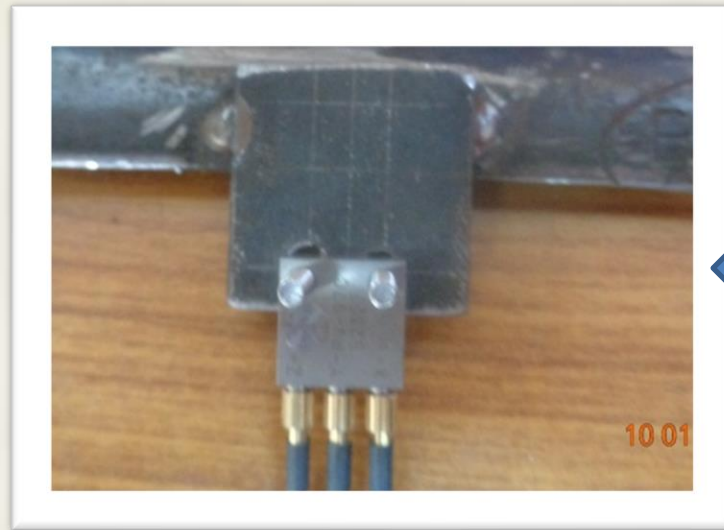


Dynamo, Data Logger



Sample Divider

Connection process



Accelerometer meter



Accelerometer cable



Pre amplifier



Vibration meter



Facilities and Example Mini tiller test result:-



Parking Test



Slope Test



Mini tiller (XPW1050 D (E))

SL. No	Particular	Specification	Remarks
1	Dimensions LxBxH (mm)	1790x975x1120	Recommended and complied as per National Standard (BTS) Note: RH: Right Handle LH: Left Handle Day is expressed as 7 hs working
2	Engine	Air cooled, 4 stroke, diesel Engine, Single cylinder, 7kW, 3000 rpm	
3	Field Capacity @ Fuel Consumption		
	Mean Value: -Tines	1.36±0.14 acre/day @ 6.61±1.47 l/day	
	Mean Value: - Rotary	1.56±0.17 acre/day @ 4.85±0.35 l/day	
4	Vibration (m/sec ²)	5.61±0.01 (RH) & 5.77±0.59 (LH)	
5	Sound (dB(A))	91.40±1.50 (L) & 91.50±0.10 (R)	
6	Suitability	Wet land (puddling operation suitable), dry land	

Wayforward:



- Equipment Specification: Digital Fuel consumption measurement device (request for support)
- Exhaust fume devices (use for while engine testing)
- Waterpump testing device design (request for support)
- New development of standards means require different measuring equipments
- Potato collector or picker(Technologies) (if other countries has this technologies available)

- Expertise sharing mechanism
- BSB and AMTC need to work further with ANTAM/CSAM/ADB
- Calibration and accreditation (request for support)



THANK YOU