THE STUDY AND IN-COUNTRY VISITS

- Study aimed at identifying and quantifying the wastes from municipal livestock, slaughter, and related facilities.
- Private sector is extensive in some countries, therefore scope extended to include facilities within the municipality.
- Five countries selected, one from each of the following Bank regions:
  - Africa
  - Central and South Asia
  - East Asia and Pacific
  - Middle East and North Africa
  - Latin America and Caribbean
- A representative city was selected from each country.
- The duration of each in-country visit was three weeks.
TYPES OF FACILITIES VISITED

- Relevant government offices
- Livestock markets
- Slaughterhouses (municipal and private)
- Offal / waste processing facilities
- Meat processing facilities
- Waste treatment and disposal facilities
- Public markets (where livestock are sold)
- Supermarkets
- Retail butchers
- Other related facilities

DATA COLLECTION

- Much secondary data is available on the livestock sector, but there is little published data on its waste products.
- Therefore, the focus of the in-country visits was on the collection of primary data from site visits and meetings.
- Where available, additional secondary data were gathered.
- Photographic and handheld video footage were obtained during the visits, where possible.
- For larger facilities, and where permitted, multiple visits were generally needed to cover all of the plant operations and infrastructure.
- It was essential to be present during slaughtering to track the progress of the carcass and each of the waste products.
LIVESTOCK MARKET WASTES

- Bedding
- Livestock urine and faeces
- Wash-down water
- Stormwater runoff
- Feed and food wastes
- Human wastes (organic and inorganic)

SLAUGHTERHOUSE WASTES (1)

- For the purpose of this Study, slaughterhouse wastes include everything that is not part of the formal product leaving the facility.
- The product is typically the carcass.
- Where on-site boning is carried out, the product may be only the meat itself.
- Ruminant carcasses are often quartered for ease of handling; thus in the industry, the remaining body parts are often called the ‘fifth-quarter’.
SLAUGHTERHOUSE WASTES (2)
The fifth-quarter typically comprises:
- Hide / skin
- Head, feet, hooves, and horns
- Thoracic offal (heart, lungs, kidneys, liver, etc.)
- Abdominal offal (stomachs, intestines, etc.)
- Stomach contents
- Intestinal contents
- Blood
- Bones
- Foetal remains
- Other wastes include similar to those at livestock markets (from holding pens, etc)

GENERAL FINDINGS
All five of the countries visited had the following similarities with respect to slaughtering and meat products:
- Refrigerated meat products are not popular and ‘fresh’ meat is preferred by the populace.
- The informal slaughter sector is extensive.
- Municipal slaughterhouses are often old and operating significantly over their intended capacity.
- The private sector is increasingly active and generally has modern facilities, but operates in small niche markets.
- Processed meat products are not popular and are a private sector operation.
INFRASTRUCTURE (1)

- Locations, infrastructure, and market conditions can vary considerably.
- Few livestock markets are located within urban centres.
- Most markets appear to have already relocated to peri-urban or rural areas.
- Markets that do remain in urban areas either have plans to move or are smaller and generally trade in small-stock (often informal markets).
- Market infrastructure is poor and often no more than an open area.
- Facilities for livestock or humans are few, if any.
- Access for transport is often poor and affected significantly by wet weather.
INFRASTRUCTURE (2)

Poor location, access, and facilities in East Asia

Congestion and lack of facilities in South Asia

INFRASTRUCTURE (3)

Better infrastructure conditions and facilities as observed in Africa
**LIVESTOCK WELFARE (1)**

- Cramped transport conditions, long journeys, and little water result in dehydration of the animals.
- In some countries, draught animals are mainly slaughtered which are often already weak before travel and there can be a high incidence of dead or nearly dead stock on arrival at the market.
- Unloading facilities are often poor, leading to injuries to both animals and humans when being man-handled off trucks.
- Animals are often tethered at markets preventing movement.
- Sticks are used extensively by herders to keep the animals under control, for cattle in particular, resulting in bruising.

**LIVESTOCK WELFARE (2)**

Cramped conditions during transportation and little water available, if any.
LIVESTOCK WELFARE (3)

Unloading facilities in South Asia - livestock weak after a long journey, are often injured during unloading.

Simple unloading facilities in Africa reduce unloading-induced injuries.

LIVESTOCK WELFARE (4)

Goats tethered at a market in North Africa, amongst debris and garbage.

Assisting a weak animal to its feet in South Asia.
HYGIENE AND WASTE MANAGEMENT (1)

- Few facilities are paved and most simply have the open ground onto which animal faeces and urine collects.
- Facilities such as latrines and water supply are rarely provided, so open defecation by market workers and traders is widespread.
- There is much human activity at the markets and close contact with animals and their wastes.
- Contamination is spread as waste is walked around the site through the movement of people and animals.
- Feed and water are not generally provided to the animals at the market; this reduces the overall quantity of waste.
- During wet weather the contaminants are washed into local drains and watercourses.

HYGIENE AND WASTE MANAGEMENT (2)

- During the dry season ruminant faeces may be collected at the market and used for fuel (dried dung cakes).
- Animal wastes from markets are rarely or for fertiliser, unless there are farms close by.
- Bedding is primarily used by the trucks during transport; though most tend to minimise this.
- Soiled bedding and dung are removed from the trucks at market and collected by the municipal SWM agency.
- The quantity of bedding varies considerably between countries.
- Dead stock is minimised through emergency slaughter of sick animals.
- Dead stock is typically sold for rendering.
**HYGIENE AND WASTE MANAGEMENT (3)**

Bedding and waste from trucks in South Asia.

Animal waste mixed with municipal waste at a market in South Asia.

**HYGIENE AND WASTE MANAGEMENT (4)**

Municipal waste scattered around livestock markets in South Asia and North Africa.
HYGIENE AND WASTE MANAGEMENT (4)

Dead stock being collected at poultry market in South Asia – to go to rendering plant.

Poultry slaughter waste in municipal waste collection bin at the same facility.

WHAT CAN BE DONE?

• Improve livestock market infrastructure and facilities to provide better conditions for the workers and animals and improve the safety of both.
• Improve transport access and unloading facilities to improve animal welfare and transport efficiency.
• Improve hygiene and sanitation at markets.
• Improve market management and control of waste products.
• Provide hygiene, sanitation, and disease education for municipal staff, market operators, workers, and traders.
• Improve animal welfare practices through knowledge and education.
• Improve and expand veterinary inspection services.