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Standards, Quality and Test for Fuel and Cooking Equipment

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Outline of the Presentation

- Definitions
- What do we need ?
- History of quality assurance approaches relevant for Western Africa
- Components of quality assurance
  - Stove type quality
  - Stove production quality
  - Fuel quality
- Relevant actors
- Questions / Discussions

Definitions

- **Standard** : document of reference, established by consensus and approved by a recognized body (ISO)
- **Quality** : Degree to which a set of inherent characteristics fulfills requirements (ISO)
- **In practice**
  - Quality of a product means that it meet end-user expectations in terms of performance, functionality, reliability and affordability
- **Quality is the result of end-user feeling**
  - Introduce notions of “product/service” and “client”

Definitions

- **Protocol** : a method for testing product

- **Testing protocols of cookstove** :

  - Water Boiling Test (WBT) : is a rough simulation of the cooking process that intended to measure stove performance to boil and simmer water. Tool for evaluating stove design as well as comparing different stoves using a common protocol.
  - Controlled Cooking Test (CCT): intended to determine stove performance by preparing common foods cooked by local people in a controlled setting. Design to assess the performance of improved cookstoved relative to what it is primarily meant to replace.
  - Kitchen Performance Test (KPT) : tests performance in reality (field test). Directly measures daily household fuel consumption.

What do we need ?

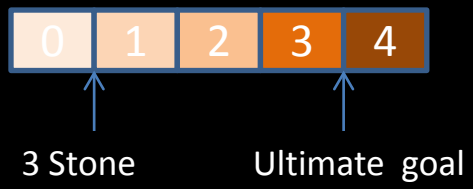
- Meet societal demand : in the global market of today, organizations are challenge to deliver quality products and service that meet customer expectations
- Technology development : affordable and efficient cookstoves that meet global standards
- Development of protocols, standards and benchmarks
- Testing and certification
- Labeling for cookstove can have categories (for example Silver to Platinum)
- Testing protocols – emphasis on field testing

History of Quality Assurance approaches relevant for West Africa

- In 2005, CILSS/UEMOA developed and approved a mechanism for cookstoves labeling.
- The proposed approach includes :
  - Accreditation of qualified laboratories to perform WBT, CCT, KPT and safety tests
  - Awarding of quality label to producers, providers or developers
  - The « Cahier de charges d'utilisation du Label » contains a model contract for the use of this label stipulated by CILSS / UEMOA.
- It does NOT define minimum standards or tiers
- *What has been realized of this plan?*

History of Quality Assurance approaches relevant for West Africa

- **The Global Alliance for Clean Cookstoves (GACC)**
  - Is promoting International Standards (in process to develop ISO Standards for cookstoves)
  - Updates testing protocols version: WBT, safety parameters
  - Defines tiers for absolute standards on fuel consumption, emissions, IAQ, safety



Components of quality assurance
1) Parameters for stove type quality

- Cooking power
  - Speed to boil water
  - Turn down ratio (ratio of the stove's high power output to its low power output)
  - Firepower
  - Thermal efficiency

- Fuel consumption
  - Quantity of fuel consumed for a given task
  - Type of fuel that can be used

- Emissions
  - Quantity of health endangering toxic emissions?
  - Quantity and type of climate relevant GHG emissions?

- Durability
  - Expected lifetime?
  - Up to which point of decay a stove can be considered as an improved stove?

- Stove Security
  - Sharp Edges and Points
  - Stability, Cookstove Tipping
  - Flaming fuel falling out of Containment
  - Surface Temperature and Heat Transmission to Surroundings
  - Flames surrounding the cooking pot

- Convenience
  - Is the stove appropriate to the usual tasks in an average household?

Components of quality assurance
2) Testing the stove type quality in the Laboratory

- Laboratory:
  - WBT, CCT for fuel consumption
    Standard methods of several Institutes
  - WBT with emission testing
    CERER is setting up a LEMS
  - Security protocol
    Methodology available, however rarely used
  - Durability test
    Methodology has to be developed

Components of quality assurance
3) Testing the stove type quality in the household

- Monitoring in the households
  - Fuel consumption: KPT
    Standard methodology
  - Indoor Air pollution
    First approaches with appropriate equipment
  - Durability
    Methodology for systematic monitoring has to be developed
  - Convenience / acceptance
    Standard methodology: acceptance tests

Components of quality assurance
4) Stove production quality

- **Parameters**

 - Are all stoves conform with the approved stove type: measures, material, tolerances?

 - Are all the produced stoves of the same quality?

- **Methods to test and insure the stove production quality**

 - Adequate training of the producers, providing tools for quality management

 - Control of the produced stoves

 - Certification of products or producers

 - Labeling

Components of quality assurance

- -> Need for fuel quality standards

Quality parameters:

- Sustainable source
- Minimum product quality in terms of
  - Heat value
  - Low Emissions

Up to now very few approaches

Relevant Actors?

- **Improving the quality of stove types, Development of better stove types**
  - Research Organization: Stove testing, recommendations for stove improvement
  - Bureau of Standards: defines minimum quality stove types
  - International Donors: may define minimum quality for their projects
  - Private Entrepreneurs: develop high performance products

- **Monitoring and Management of stove production quality**
  - Project implementing organizations: training of producers, quality monitoring
  - Quality Label: Who acts? Producer organizations? Governmental organizations? Research institutions? Project implementing organization?
  - Private Entrepreneurs: guarantee a high quality of their products as a marketing argument

Pertinent Questions / Suggestions for discussion

- Relevance of lab tests <-> field tests
- Emission testing is interesting. However, it leads to testing procedures far from reality.
- Life time of improved stoves?
- Does it make sense to fix absolute minimum standards (GACC)? Or is it more realistic to focus on improvement rates (40% GIZ)
- Quality <-> Price and affordability
- Organization of a quality management system:
  - Which criteria?
  - Powerful actors?

Thank you for your attention

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