

ABSTRACT

International Lifeline Fund (ILF) seeks to improve the quality of life of the underprivileged by expanding access to energy solutions and clean water. Their factory in Lira, Uganda manufactures commercial cookstoves that are fuel efficient and cater to the needs of consumers in Uganda.

ILF seeks to develop a manufacturing operating system (MOS) that is appropriate for their planning and operations. Our objective is to provide process and resource documentation

to allow ILF to develop a MOS. This included gathering data in Lira, Uganda (Fig. 1) regarding manufacturing steps, cycle times, material requirements, and material flow.

THE DMAIC WAY

- **Define:** Consulted stakeholders (ILF) and subject matter experts (Paul Means of BURN Design Lab)
- **Measure:** Traveled to Uganda for data collection
- **Analyze:** Transformed data into meaningful depictions of the cookstove manufacturing process
- **Implement and Control:** Out of scope



Figure 1. Team in Uganda



MITIGATING THE SAHARA: COOKSTOVE MANUFACTURING



Corvallis, Oregon | Lira, Uganda
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 Sponsor: International Lifeline Fund

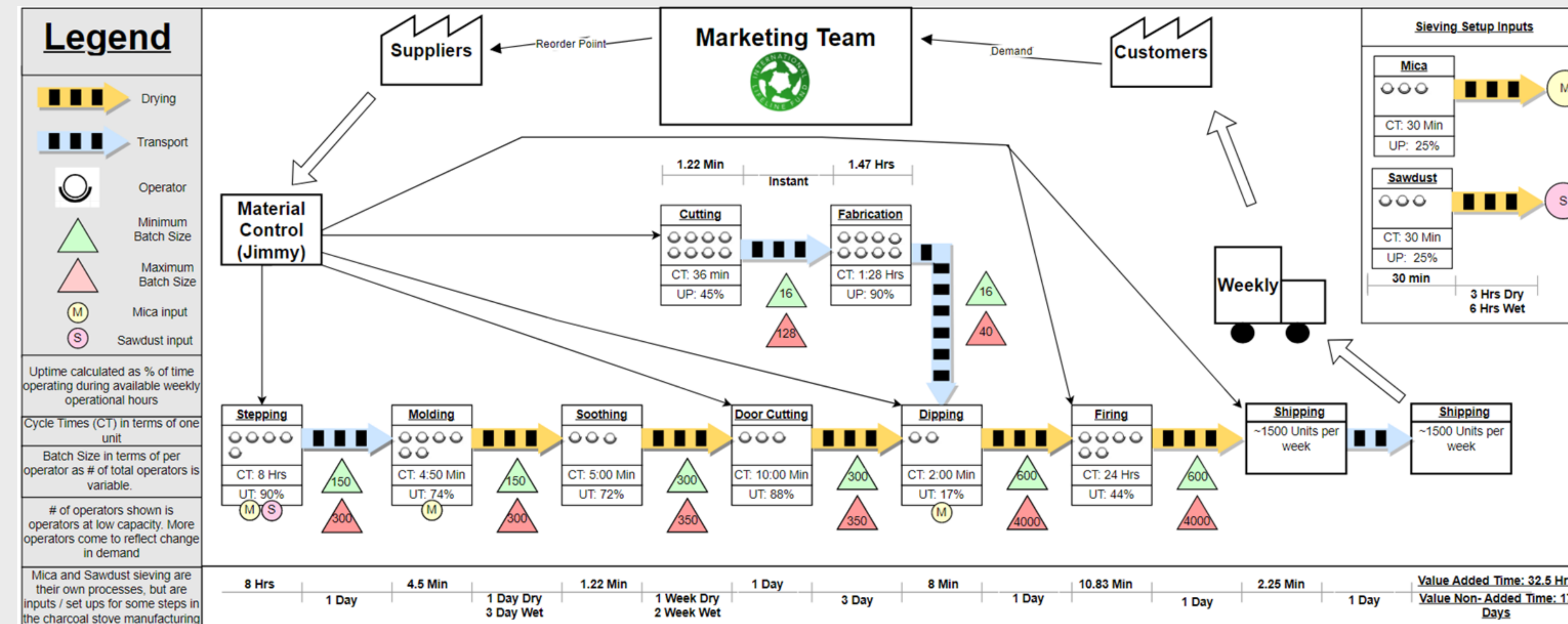


Figure 2. Charcoal Value Stream Map (VSM)

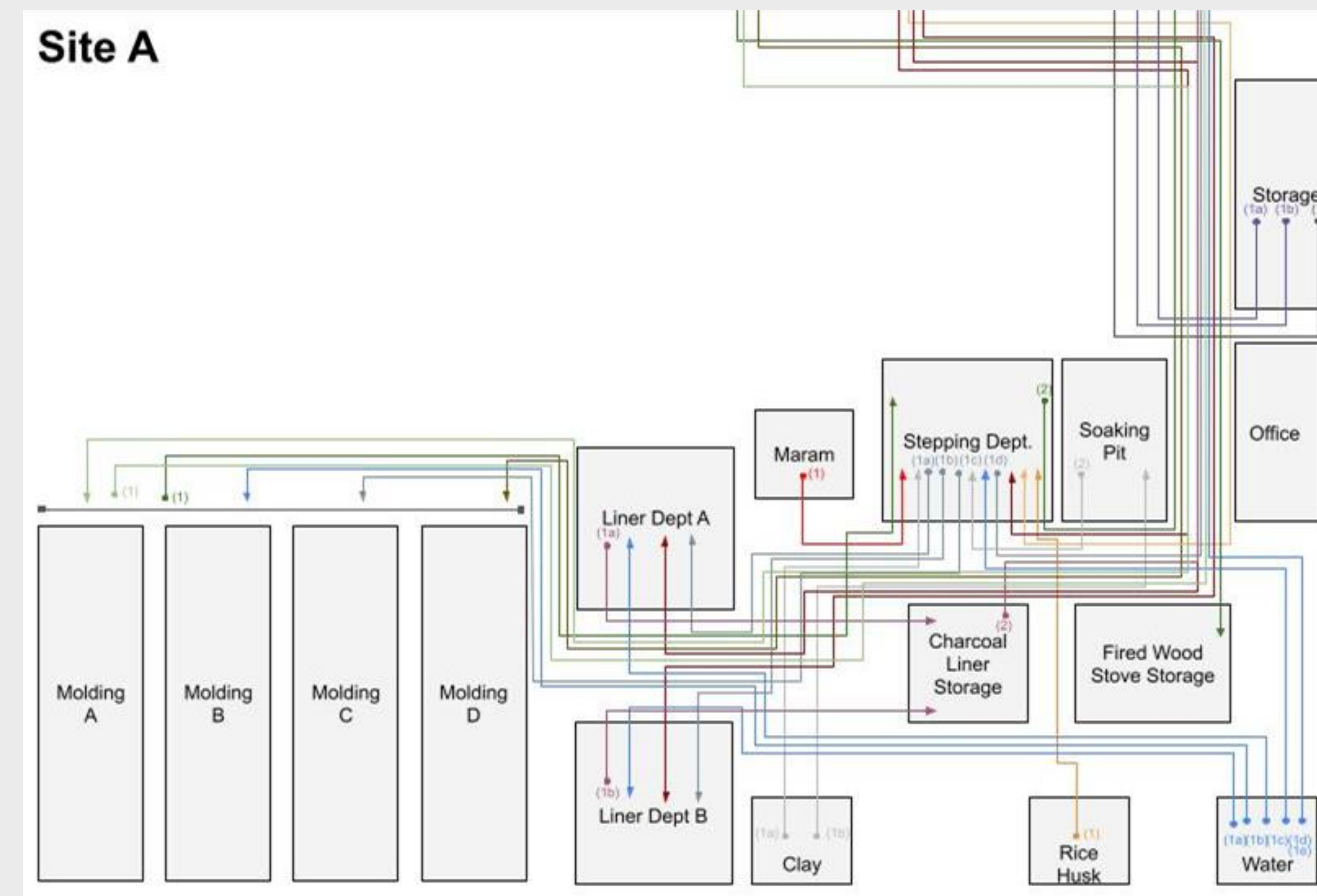


Figure 3. Spaghetti Map: Site A

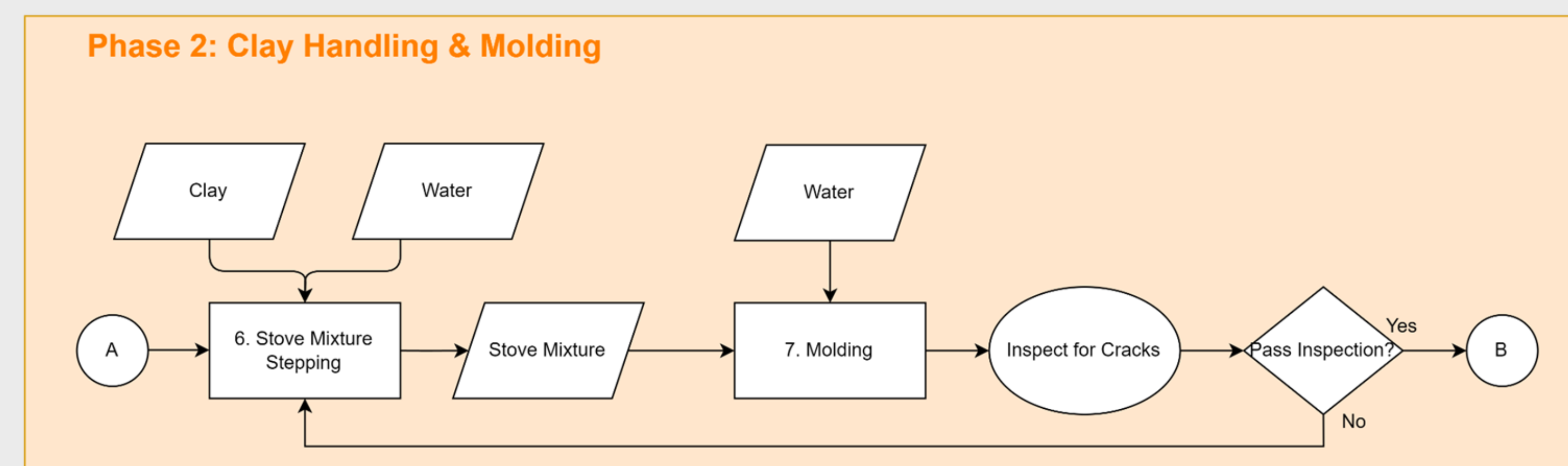


Figure 4. Flowchart Institutional Stove Brick: Phase 2

THE DELIVERABLES

- ILF lacks standard times across their manufacturing process. The **value stream map** (Fig. 2.) highlights areas to be improved as well as defining cycle and uptimes across the factory for a product.
- The **spaghetti diagram** (Fig 3.) gives a clear, up to date representation of the physical layout of their facility. It shows the flow of materials and products. This will help with future layout and organizational planning.
- **Flow charts** (Fig 4.) depict the steps in the process from beginning to end in a visually appealing and easily comprehensible manner.
- **Standard operating procedures (SOPs), a managerial report, and job recipes** for each step in the process are included in final deliverables to further aid in documenting activities in ILF's cookstove plant.

RESULTS AND FUTURE

The team set out to provide ILF with detailed and accurate process documentation. The team accomplished this by providing flowcharts, SOPs, and managerial reports that describe the process and by providing a spaghetti diagram and job recipe that describe the use and movement of resources at their factory in Lira, Uganda.

With these deliverables and the notes, pictures, and videos the team gathered, ILF will be able to develop a manufacturing operating system to support meeting their growing cookstove demand, and achieve their mission of improving the quality of life of the underprivileged by expanding access to affordable energy solutions.



Figure 5. Jacket Fabrication



Figure 6. Kiln Loading



Figure 7. Cookstove Branding