Training Manual for a Village Soap-Making Operation

Presented by Larry Plesent and Sandy Lincoln with assistance from Ezra Nkrumah

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This manual is intended as a guide to the creation of a village-based liquid and bar soap operation; basically a small factory. All equipment is made from generally available materials and all ingredients are locally sourced.

It is most important that the group learn to approach this endeavor with a spirit of innovation and experimentation. Raw materials will vary from region to region, so the basic formulas are intended as a general guideline only. Once the principles of saponification are understood, the soap-makers will be better able to develop their own products based on the plant oils that are available to them. Soothing, medicinal and aromatic herbs can be added to improve and modify the basic soap products.

Around the world, knowledge of the indigenous plants and their uses are being lost. It is the hope of the authors that the creation of local soap-making operations will also develop a renewed interest in local flora. The world is our garden. We need only to treat it with respect and it will nourish us, and the generations to come. Plant based raw material sources must be protected through sustainable agricultural practices, wild-crafting (careful harvesting and dissemination in the wild), or by allowing areas to naturally recover between harvests. Tendencies to over-harvest in the immediate village environment must be curtailed. As the operation grows, this becomes more and more important. Sustainable programs consider the full circle, from sourcing and protecting raw material sources, to finding responsible uses and disposal options for waste products.

Once the students eyes are opened to the riches of the natural world around them, and to the excitement that comes with experimentation and innovation; the lessons learned will carry far beyond the soap-making project itself.

Safety First

It is vitally important for the wellbeing of the company and the workers, that safety is insured, hence the phrase, "Safety First!" The work area should be kept clean and free of debris. The floor should be swept daily and all containers and utensils should be washed after use.

Alkali solutions are caustic. Rubber gloves must be worn whenever handling alkali crystals and solution. Safety glasses must be worn while mixing alkali to protect the eyes from splashing, and care should be taken not to breathe any of the fumes that rise up from cooking soap products.

Clean, cold water must be close at hand in case of alkali or fire burns. Rinsing eyes or skin with cold water is the standard antidote for exposure. Milk contains lactic acid and will neutralize alkali should it get in the eyes or be ingested. This may prevent blindness that can result if alkali remains in the eye.

Lifting large kettles and containers of ingredients should be done with care and with the help of co-workers.

Soap-Making Terminology

TARE WEIGHT – The practice of resetting the scale back to zero after a container is placed on it.

ALKALI – The caustic substance that neutralizes the fatty acids in oils to make soap.

BASE OIL – A non-aromatic oil that is the main ingredient in a soap product.

EXOTIC OIL – Other plant oils that are added to soap. 2 - 10% can change the properties of the soap.

ESSENTIAL OIL – An aromatic oil distilled from plants and used to scent and preserve. May have anti-microbial & anti-viral properties. External use only.

SAPONIFICATION - The reaction that occurs when oil, water and alkali are properly mixed.

ALKALI BALANCE – It is important to use a precise strength of alkali to neutralize the base oils so that no free alkali is left in the soap. It is better to have a small amount of unsaponified oils in the soap (free oils) than to have free alkali. Free alkali can be extremely irritating to the skin and may cause a rash. However, soap with too much free oil will have poor lather & a short shelf life.

FATTY ACIDS – A fatty acid is a chain of carbons with an oily head. All oils are made from fatty acids in the form of triglycerides. Shorter chains make quick, large bubbles, and larger ones made a rich, luxurious lather.

MOLECULES - The basic building blocks of matter

TRIGLYCERIDES – All natural oils are composed of three fatty acids attached to a glycerol molecule.

SOAP MOLECULE – The molecule formed when cautic removes the fatty acids from the glycerol and attaches itself to the tail of the fatty acid. Glycerin is the by-product of this reaction or saponification.

Basic Tips for Soapmakers

- Always filter and measure ingredients carefully.
- Do not use ingredients by their quantity but by their weight. It is important to have a good scale for weighing accurately. Always use "tare weight".
- Always use fresh ingredients. Garbage in, garbage out.

- The strength of the alkali solution should be the same all the time. Hence, care must be taken to make the solution the same way every time.
- Store alkali crystals (potash) in a tightly sealed container. Moisture from the ground and the air will rob the crystals of their strength.
- Alkali and alkali solution should not be kept in aluminum or stainless steel pans as they will loose their strength.
- Always stir the base oils in the container before weighing as they may have separated into layers during storage. Palm oil is especially apt to do this.
- Always add alkali solution to oils, not oils to alkali solution. Exception liquid soap for which you add oil to cold alkali solution.
- Add alkali solution to oils slowly. Break up the stream by pouring through a sieve. This will insure that the alkali and oils mix evenly.
- Always stir the oils while adding the alkali solution.
- Always check your alkali balance to make sure that it is exact, thereby reducing the chance of free alkali or free oils which result in a lower quality product. It may be necessary to make small adjustments to the basic recipe to keep your alkali balance.
- Always let the alkali solution settle after it is mixed. This way, undissolved materials will settle to the bottom and not be added to the product.
- Always make alkali solution the day before making soap.
- Be consistent and reliable in making products.
- Be ready to experiment! Try new exotic oils. Remember, changing your oils will change your alkali balance.
- Experiment with different combinations. Try adding dried plant materials, grated citrus peels, or grains (ie oatmeal or cornmeal). Herbs must be ground and sifted, though not as fine as flour. Soaking the herbs and grains in an essential oil for approximately 20 minutes will help to keep the aromas in the Black soap.

The Chemistry of Soap

It is very important to understand the chemistry of soap in order to produce a consistently highquality soap product. Soap-making, or saponification, is the process of taking oils that make you greasy and turning them into soap that makes you clean. Soap is not oil(s), but rather a new substance produced by the interaction of base oils, exotic oils, and alkali solution. The key to making good soap is to insure that no free alkali or excessive, free oil remains in the finished product. Since the oils are a natural substance, the basic recipe will have to be adjusted from time to time. During the hottest time of the year, plants will produce extra natural waxes to slow the excessive loss of water (transpiration). Waxes will not saponify (turn into soap), and therefore, it is to be expected that there will be a slight variation in the recipe depending on the season.

The Reaction

If we were to examine an oil molecule under a powerful microscope, we would see that it is made up of three fatty acid "tails" attached to a glycerol molecule at the central point. A fatty acid is basically a chain of carbons holding hands. Think of it as an oily, slightly acidic

tail. Different oils will have different lengths of tails. Different lengths of tails will have different properties when turned into soap.

The active ingredient to initiate a saponification (soap making) reaction from oils is called caustic. In a village environment, potash is used as the caustic source. It is the nature of caustic to wish to split fatty acids from the glycerol and attach itself to the end of the fatty acid tail. This makes a new substance (SOAP!), which is like a snake with an oily, water hating tail and a caustic, water loving head. This love water/hate water aspect of soap is what creates lather.

By understanding the basic principles of the reaction, we can now solve problems that inevitably arise during the production of soap. Because we now know, on a molecular level, that the caustic must leave water to find the end of the fatty acid and split it from the glycerol; it becomes clear why we must add our solution slowly and break up the stream allowing the caustic and oil to find one another. Heat and or time will facilitate the reaction.

This is how we taught the story in Liberia:

When a man goes to build his house he uses bricks. Bricks and more bricks go together to build the house. Just as a house is made of bricks, the bricks themselves are made of sand, so small and in such quantity they could never be counted. In the same way, everything in God's creation is made up of smaller pieces, many of which are too small to be seen.

Some things are tart like a lemon, orange, pineapple or paw-paw. The parts that makes it tart are called acids. Acids are like a lonely man. He wants to share his energy in order to feel correct. Other things, like wood ashes or bleach are caustic. Caustic is like a woman. She also feels lonely and wants to pull energy to her. When they find each other they share their energy and become something new; a family. This makes them very strong and very stable. Oils are acidic. Not as much as an orange, but a mild acid none the less. When we make mix our mild acid oils with a strong caustic mixed in water they come together like when a man and a woman are drawn to each other. Oils + caustic + water combine to make soap. Soap is very different from either oils or caustic, but it also retains some of the properties of each – just like in a family.

Caustic Balance

Good soap must achieve a balance between oil and caustic. If it is too oily it will be soft and melt fast. The soap will take a long time to dry and will not make a good foam. If it is too caustic it will be harsh and dry or burn your skin. It will wear out your clothes fast can cause a rash. The secret of good soapmaking is to achieve the balance you want in your soap. A good laundry soap is tipped slightly towards the caustic side. A good body soap is tipped slightly towards the oil side.

Water may smell or taste strong, or like metal. You are sensing the dissolved molecules in the water. These molecules will bind with your caustic reducing its potency. For this reason always use pure, clean water or rainwater if you can. If you only have access to pond water, filter it through sand in a tube to purify.

Caustic loses its potency over time, if it gets damp from humidity, or if it turns solid like a brick while still in the bag. Always buy caustic that flows and keep the bag tightly sealed all the time. Store your caustic off the floor.

Oils will change over the course of the season. A trained soap maker adjusts accordingly.

Always measure very carefully. Use a scale or homemade balance beam. If you must measure by eye, have the same person doing the measure every time. Examine your soap carefully when it is dry and determine if you want to add more oil (less caustic) or less oil (more caustic).

Blended Oil Soaps

Most traditional soap makers make single oil soaps. Palm kernel oil is the main ingredient used by soap makers in Africa. A superior soap can be made by blending 90% palm kernel oil with shea butter or coconut oil. (9 parts palm kernel oil to 1 shea or coconut oil). Adding 5% vegetable oil will make an even better soap for skin and hair. (85% palm kernel, 10% shea or coo nut oil and 5% vegetable oil especially sunflower oil).

Pretreating your Palm Kernel Oil

Take a small amount of caustic, enough to make a small mound in the palm of your gloved hand and add it to each plastic 20 liter palm oil container you have. Leave this in the sun for a full a day, then use it to make soap the following day. Skim and remove any residue on top or bottom. Pretreating lightens the soap and makes it cleaner and easier to work with.

Making Traditional Alata or Black Soap

A recipe for 5 kg of finished soap – Put 1.2 kg of palm kernel oil into a steel drum. Add 3.6 kg of boiled or burned palm koil and stir the mixture. Place mixture on a gentle fire and start towards a slow boil. Slowly add the caustic solution, breaking up the stream in a sieve., or keeping it small like your smallest finger. We used a 50% solution of locally made crystals (potassium carbonate). When adding the caustic solution, stir the oils all the time. Keep at a slow boil for about 2 hours, stirring the mixture all the time, until it begins to solidify. Add essential oils as desired once the soap is finished cooking. Remove from the fire to finish off slowly. Pick the soap to release the air trapped in it from stirring. Take out soap and spread on a flat wooden board to dry in a cool, well-ventilated place overnight.

The quality of the Alata soap will be significantly improved by pressing or pounding the soap into a mold or form. There are many ways to achieve this. In it's most basic form, freshly made alata soap should be dried 1 - 2 days depending on conditions. It can then placed into a short, thick-walled plastic pipe (PVC drainage pipe works well), $2\frac{1}{2} - 3$ " in diameter. A heavy pounding stick of slightly smaller dimension is used to compact the soap, which is then removed and cured (dried) further. More sophisticated pressing devices can be designed and constructed, incorporating a long-handled lever with a short, swinging piston that fits into the tube. Counterweights or springs can be used to lift the lever back up to its original position.

It is not our intent to outline a specific machine or method, but rather to encourage experimentation using available materials.

Making Traditional Quick Soap (Iron Soap, Rock Soap)

This is the improved recipe we developed in Liberia. It produces a milder and higher quality result than the traditional method and formula in use previously.

Mix a 33% caustic solution the day before using 1 part caustic to 3 parts water. Place 2 liters of burned palm oil or blended oils into your mixing tub. Slowly add 2.5 liters (2 ½) of cooled caustic solution following the general instructions above. Roll into balls gloves made by placing hands on plastic bags and covering with socks. Curing takes place in the balls. Dip hands in fresh water and smooth the outside into a nice finish. Dry overnight. The soap will improve the longer it sits, as will all bar soaps.

Making Box Soap (Slow Soap)

This is good quality cold process, poured soap. Box soap process results in a bar soap of higher quality and lower caustic with a 1-2 week cure time in and out of the box. Box soap works in the tropics because the palm kernel oil sets the soap up hard and fast.

Making Your Own Caustic

You will need to make your own caustic if bag sodium hydroxide or potassium hydroxide is not available to you.

Caustic is not ash. Do not use ashes to make soap. Caustic comes from certain ashes that contain it; hardwood and cocoa pod are often used. Mangrove leaves are very good (best) for making bar soaps. In Liberia we used plantain and palm straw (dry dead palm leaves).

You must use fresh ashes that have not stayed overnight on the ground. Moisture robs the ashes of their alkali. Burn them in a drum or a barbecue. Use filtered ashes – not black charcoal. Here are several methods of making caustic.

Early American Method: Take a small wooden keg and fill with ashes. Slowly pour rainwater into it moving the water evenly through the ashes, and slowly and carefully collect the water from out the bottom hole in the keg. Only use rainwater if possible. Take your water and filter it a second time to be sure you get all the alkali form the ashes. As the water leaves the keg the second time, filter out the ashes through a cloth or screen. This water will burn your skin or eyes if it gets on them so be careful! Have clean water nearby to wash off any caustic that gets on you.

African Method #1: Boil filtered ashes and water (rainwater is best) for 1 hour with filtered ashes. Cool, and settle. Skim the top and gently pour off the water. This is the potassium carbonate. Make crystals for long term storage by boiled off all the water. Do not breathe the steam. When all the water has left you will see ashy powder with some crystals in it. The crystals are the alkali. Dissolve in a small amount of clean water, settle, pour off the liquid, and boil off (or dry in the sun) the remaining liquid until only the crystals remain. When the water is mostly gone you must pay attention so as to dry the mix without burning it. Store the crystal in a clean,

dry stainless steel or plastic pail with tight lid. Re-activate by mixing alkali in to water (rainwater is best) the night before you make soap.

African Method #2: Make a filter from a palm stalk that is split into three on top but stays connected on the bottom. Weave palm leaves to male a sieve. Stuff the gaps with palm straw. Fill with ashes as per above and filter hot water through them twice. Caustic made these traditional ways is potassium carbonate. Mangrove leaves will yield sodium carbonate.

Changing potassium carbonate or sodium carbonate into potassium hydroxide or sodium hydroxide:

Buy a bag of hydrated lime (whitewash). This is calcium hydroxide. Blend 50% with sifted ashes. Hydrated lime is about 20% lighter than ashes so adjust accordingly if no scale is available. The calcium hydroxide and potassium (or sodium) carbonate will switch places to make calcium carbonate and potassium or sodium hydroxide. The calcium carbonate will settle to the bottom as a thick gray clay like powder.

Making Liquid Soap

Liquid soap is made by slow boiling oils, alkali and water. It is not as demanding a product to a make as traditional Alata soap because 1) while it is cooking, other projects can be accomplished and 2) errors in alkali balance can be easily rectified by adding any of the three basic ingredients.

Liquid soap is very useful for laundry, dishes, cleaning floors, wood, automobiles, rubber, and basically, all water-safe surfaces. For these types of applications, it is easier to use than working up a lather from bar soap. With practice and the addition of small amounts of exotic and essentials oils, liquid soap can be made mild enough for washing hair and for use on skin.

Use a steel drum or a thick local aluminum pot for cooking. Western Aluminum is not suitable for making liquid soap. Start with approximately 10 gallons of cold, clean water in the drum. The exact amount of water is not critical. While the water is still cold and being stirred, slowly add 11 kg of dry alkali crystals. Start the fire. Slowly add 11 kg of palm kernel or coconut oil. Be sure to stir the water while adding the oils. Weigh and filter both the alkali and the oils. Bring to a slow boil and continue cooking for 4 days. The liquid soap will begin to clear from the bottom up, with a color and clarity similar to coca-cola. Eventually, there should be no oily material on top. You may need to add a little alkali or skim the top and continue boiling. Remove from fire and let cool overnight. Skim away any remaining oils from the surface. Drain and filter liquid soap into a new container. Let sit one day to allow any unsaponified oils to rise to the top and any ashy residue to settle to the bottom. Skim and filter as necessary. Experiment by adding small amounts of exotic oils to soften the soap and make more suitable to hair and skin. Add essential oils as desired. We made liquid soap in Ghana using local crystals and in Liberia using home made potassium hydroxide with good results and a long shelf life.

Storing the Finished Product

It is a delicate balance to manufacture and store enough product so that sales can be made and customer demand can be consistently fulfilled, yet not create so much inventory that excess product is lost to spoilage and age.

Because soap products contain a slight amount of unsaponified oils, they are subject to spoil and go rancid. Heat and oxygen are particularly hard on soap products. Without proper storage, they will diminish in quality, appearance, and aroma. Both liquid soap and alata bar soap must be kept in a shady, cool place. It is also important to protect the quality of the ingredients by keeping all base oils, essential oils, and exotic oils out of the sun. Leftover oils or soap should not be left in the bottom of a metal drum for any length of time, but rather be transferred to a smaller container with a tight fitting lid. Alkali crystals should be kept in an airtight, sealed container so as to protect them from moisture. Some essential oils have properties that act as a preservative in the soap. For example, rosemary oil can serve in this way. Again, however, sun and heat will cause essentials oils to evaporate from the finished products.

How to Build a Simple Distillation Machine

The process of the distillation of essential oils from plant materials is very similar to the distillation of alcohol. Start with a large steel drum with a tight fitting removable top. It is vitally important that the inside of the drum and the lid have no paint. Inside the drum, place a metal grid so that is stands about halfway up. Design the grid so that plant materials will not fall through. A small leak-proof drainage hole is to be made at the bottom of the drum to remove water when the machine is not in use. A clean, flexible copper pipe is inserted into the hole in the lid. Seal around the connection of coil to lid, so that no steam can escape. Make at least six coils of even diameter in the copper pipe as it comes away from the first drum and is fed into a second drum filled with cold water. These coils serve as a pre-cooling system. In the second drum, the copper tubing is formed into a second set of coils laying horizontally in the bottom so that they are completely covered with water. The cooling drum should also have a drainage hole so that as the water heats up it can be removed and replaced with cool water periodically. Finally, the end of the tube is run out of the drum and into a small container.

The first drum is set on the fire. Water is added to a level about 25 cm below the grate. Upon the grate is laid the plant material (bark, flowers, herbs, etc.) from which the oil will be extracted. Material should be crushed and cut to open it up to the steam of the hot water. As the water boils, steam passes through the bruised plant material, picking up the aromatic or essential oils. Steam rises up through the two sets of coils, cooling as it passes through the second drum. Once cooled, the essential oil can be see in a thin layer floating above the captured water coming out of the end of the tube. The water underneath is called hydrosol. It has a faint aroma and may be recycled to make liquid soap and other products. Remove the oil from the top of the water and store in a tightly sealed container.

One effective way to remove the essential oil from the hydrosol is to channel the liquid through a series of shallow bowls, each smaller than the other, and each with a small depressed lip just below the rim of the vessel. Water is carefully poured into the largest bowl, raising it to the level of the rim until the surface oils skim off into the second bowl. With each bowl, the resulting oils become further separated from the water.

There are many opportunities for distilling beautiful essential oils from the plants in the immediate environment, plants that are either responsibly harvested or cultivated. Adding such oils can help achieve diversity in color, aroma, and benefits in soap products. Essential oils also stand alone as a unique product for production and sale.

Principles of Blending and Using Essential Oils

Aromas may be thought of as notes on a musical scale. Base or bottom notes come from aromatic woods, twigs and roots. Heart or middle notes come from aromatic flowers, and top or head notes are derived from citrus peels and leafy minty plants. Additional notes include spicey and herbal notes.

Some aromatic plant oils will not fix or stay. This is particularly true of many flowery heart notes. A good test to discern whether a flowering note will fix is to dry the flowers (out of the sun and with good ventilation). If it still has a good, true aroma once dried, the oil will likely fix as well. Many strong essential oils, such as lemongrass, may be used by themselves. However, proper blending of essential oils together will produce an appealing and more sophisticated aroma.

Creating the "mmmmm" response

There is a universal response in all human beings, regardless of culture; to say "mmmm" when they smell an attractive and properly blended aroma. People will naturally want to buy a product if smelling it makes them go "mmmm". The secret of achieving this effect is to blend base, middle and top notes together, creating a harmonious result similar to the playing of a musical chord. Spicey and herbal notes can further accentuate a unique blend.

Always add essential oils at the end of the soap-making process as heat will cause them to evaporate. Other plant materials, such as finely ground cocoa, can be added to create a visual match with the aroma instilled by an essential oil blend.

Marketing and Merchandising

The attractive presentation of products will greatly enhance sales. A clean, vital display is key, whether you have a single product for sale or a variety of items. Diversity of product creates more opportunity for designing presentation, display and signage in such a way as to build interest and excitement. A good sign goes a long way to advertising product and educating the consumer.

Products and displays should always be clean, colorful and well-organized. It is important to have lots of product available to attract customers. "Stack 'em high, watch 'em fly" is a time-honored marketing approach.

Much of the product manufactured will be consumed within the local market. Quality, consistency, reliability and availability will be the greatest sales tools. Find a regular location in the market center to display and sell your goods. Be regular in your attendance so that customers come expect your presence. Be attentive to the customer and ready to supply a paper or bag to wrap their purchase. Success will yield more opportunities and consideration should be given to participating in larger, regional markets and to developing special packaging for the tourist or traveler's market.

How to Compete

Customer Service – Be available, attentive, and courteous to the customer. Stop conversations with family or colleagues when a customer is considering your wares. Know the product and be able to answer questions. If a customer reports a problem with a purchase, it is important to listen well and not to argue. When you accept responsibility for the problem, the customer is able to relax. A refund or credit for another soap product is always a good strategy. Always seek to develop a positive relationship with a dissatisfied customer for they will be your biggest advocate once the problem is resolved.

Price – Some companies compete by having the lowest price. In this way, there will always a market for their products. However, it is very difficult to produce a quality product on a small scale when you compete on this level. As well, customers will have little loyalty to the product if eventually the price is increased.

Quality – There is always a market for high quality products. Because high quality goods are more expensive, quantity sales may be lower than if you were to compete on price. However, if priced reasonably, the same amount of profit, even more, can be achieved.

Consistency – Nobody wants to buy a product that is different every time.

Availability – People are soon discouraged if a product is available one day and not the next time they go looking for it. When taking products to market, establish the same location, same day of the week, same hours, and even the same staff person if possible. If people like a certain product, they will consider others. By having variety and offering choice, you can establish yourself as a specialist – a powerful marketing position.

Value-Added – People will pay extra (a premium) for a product that has an aroma they especially enjoy. Tourists might desire a pretty package, or one that represents the local culture, and so remind them of their visit. Adding value is an easy way to increase profit margin.

Benefits – People will pay a premium for a product that solves a problem. If using your liquid soap for laundry and your alata soap for skin serves to alleviate a skin irritation, for example, they will have a strong customer loyalty to the product and become a repeat buyer. They will also be an advocate for the product to friends and family.

Setting up a Manufacturing Operation

Begin with the development of a strategic plan. A distinct sheltered space for the operation must be created. Minimize walking and extra movement. Place tools and materials close to the workspace to be used. Create a lock box to store valuable tools. Remember, the more efficient the operation, the more profitable it will be. It is important to understand the concept of workflow. Raw materials come in one end of the factory, are prepared and processed, and finished goods exit from the other side of the factory.

Specialization

Each worker will have one or more specific jobs for which they are trained. Some redundancy of training should be accomplished so as to manage absenteeism and workflow. However, it is generally a good idea to give workers ownership of specific tasks. Example, some people will grow the plants to be used for raw materials, others will press or distill the oils, and still others will become master soapmakers. Packaging finished goods, selling at market, and handling promotion and paperwork can also be unique tasks. It is important to match the talents and the interests of each worker to the job.

Economy of Scale

It is very important to understand the concept of economy of scale when setting up a manufacturing operation. In every product category, a few large companies will ultimately dominate the market. Example, Coca-cola and Pepsi. This is because a larger, more efficient company will always be able to produce and deliver goods to market less expensively than a smaller one. Customer service, quality, benefits, and value-added are the primary means by which a small company can grow and prosper.

How to Organize Your Company

The following is the basic model for organizing a small manufacturing company. It is based on a "working foreman' concept. Every member of the team directly contributes to the prosperity of the company. Job expectations and responsibilities are clearly defined.

Each department is headed by a worker that is most knowledgeable and reliable in the field. These people are paid extra because of their greater responsibility. Every working foreman has an assistant foreman who can run things while they are away. The assistant earns a wage slightly less than the foreman. Below the foreman and assistant are less skilled and novice workers called 'busy hands'. They receive a slightly lower wage. Should the working foreman choose to leave the company, the assistant would be positioned to take his place and the best of the busy hands would be considered for the assistant role.

All roles should be clearly defined and expectations spelled out. Open, regular, weekly meetings should be held to clarify and address problems, insure open communication, and develop strategic planning. Interdepartmental communication is very important. In the early stages of developing a village-based operation, information sharing is somewhat organic and easily accomplished. However, as the company grows, a more deliberate approach must be instilled so as to secure harmony, growth and forward movement. In addition to open communication, a well run company will exhibit values and integrity, positive attitude, commitment to sustainable growth, creating a safe, clean and well organized space, and a devotion to providing happy, productive and rewarding work for the people. This way, the company becomes like an extended family with everyone looking after everyone else. Workers in a well-run company will stay for a long time and will not engage in theft or corruption.

Departments can be organized as follows:

Raw Materials and Acquisitions

In a village-based operation, raw materials must be secured and purchased locally, grown and harvested, manufactured and stored on site. Positioning people to secure a ready source of materials is an essential component of the operation. This department may oversee the agriculture production of raw materials or commission others outside the operation to grow for the company. Lack of raw materials can result in lost sales and risk the viability of the company.

Production

This department manufactures the basic products for sale. In the beginning, this will be the largest department. The operation will run more smoothly if each working foreman unit contains not more than five people. As the operation grows, the production department may be ripe for dividing into sub-groups, ie, one team make make the alata soap, another the essential oils, and another team would produce liquids. The working foreman who is most intelligent and reliable will oversee the entire production operation, while continuing to have hands-on responsibility in a specific area.

Accounting

Efficient and honest accounting and handling of monies in and out are a critical element in a successful and profitable company. The equipment, materials, work in progress, finished goods and formulas are the assets of the company. Money owed to the company is called receivables and should be closely attended. Money available to pay liabilities and day-to-day operations is "cash on hand'. Increased buying power as the company grows is an excellent way of building profitability and every care should be taken to buy astutely. It is also important to protect cash on hand to meet expenses. If a company is consistently able to meet one month's expenses and put aside monies for expansion (new equipment, increased staff), the company may decide to give out profit sharing to the workers. This is an excellent way to provide for the people and build staff loyalty and motivation. The total individual wage paid for a worker during a specific time period, for example – three months, is divided by the total company wages for the same time period to yield a percentage. Example, if the total company wages for three months is 1,000,000 cedis, and an individual worker has received 100,000 cedis, the worker will receive 10% of the declared profit. In this way, the profit of the company is shared by all, with the most reliable and involved workers receiving the greatest share. Accounting tasks are divided as follows:

Head Bookkeeper – This person pays the bills and wages. He/she will prepare financial statements, handle all the money and make regular deposits. An outside auditor, who is not related to the bookkeeper, should be brought in monthly to review the books. There must be zero tolerance for corruption.

Assistant Bookkeeper – Regular data entering, purchasing and inventory control.

Management

Every football team must have a captain. In a company, the manager is the person most skilled at problem solving, organization and soothing tempers. The manager has vision and looks to the future in consultation with the entire team. The manager assists the department heads in hiring and firing. The manager will also negotiate with the bank and outside industries. The manager does not personally handle any money, but rather watches over the head bookkeeper to insure honesty and efficient accounting of funds.

Sales/Marketing/Customer Service

Designs, packaging and displays help to introduce and sell product to the customers. This department works to maximize sales and identify new market opportunities. Troubleshoot customer service problems and use customer feedback to improve operations in cooperation with other departments. The sales and marketing department may begin with only one or two sales people. They often work for a base pay (guaranteed low amount) complemented by a percentage of what they sell (5 - 10%). Another model is percentage only, often 15%. The company may choose to pay for selling expenses, such as the cost of a store and transportation to the marketplace.

A successful company that grows beyond the local village market will also have a separate packaging department and a separate shipping/receiving department.

Conclusion

A successful company is built around a core group of dedicated people who donate their sweat equity to the foundation of the project. A visionary leader will keep the group together, move the project forward, and develop a profitable enterprise. We hope this manual finds itself in those hands now.

Always experiment. Be resourceful. Learn from your mistakes. Keep the basic chemistry of soap in mind as you seek to improve the quality of the product(s) and create new blends. Learn the plants around you, their names, properties and uses. Protect wild places from over harvesting and be ready to cultivate plants to source your ingredients.

Know and develop your market. Support your staff and your customers. When in doubt, do the generous thing. We are all like plants, reaching for sun and water and greater prosperity. True prosperity, however, comes not in the form of things, but in family, friends and a healthy environment in which to flourish. If we can build a business that supports the village populace, providing rewarding work and increased cash flow, we can build a sustainable future for the generations to come.

Addendum 1.

Basic Soap-Making Equipment

- Steel Kettle (for liquid soap and potash manufacturing) A standard, large metal drum can be cut down to size. No paint shiny steel only.
- Stainless Steel Cone Sieve Essential for filtering oils and alkali solution.
- Ladle
- Large Aluminum kettle for cooking Alata soap.
- Large stirrers (bamboo or wood)
- 50 kilo tare weight scale
- Metal drums and flexible copper tubing for distillation unit.
- Pressing unit, or PVC pipe with fitted pounder.
- Safety rubber gloves and protective glasses.

Addendum 2.

Bibliography and Sources

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Complete Book of Essential Oils and Aromatherapy, Valerie Ann Worwood, US \$19.95, New World Library

Encyclopedia of Essential Oils, Julia Lawless, Thorsons Pub. US \$16.95

<u>World Health Organization</u> – for numerous publications native plants and health issues around the world

Seasoned Booksellers – for books on sustainable enterprise and rural skills

www.vermontsoap.com- for information on SOAP!

The Handmade Soapmaker's Guild in the USA

Goan – Ghana Organic Agricultural Network, Resource and reference library, located at Maxima Junction ,UST – Ayigya Road, PO Box 6342, Kumasi, West Africa

Steiger Supply, A good source for stainless steel utensils and scales at wholesale. 25 Curtis Avenue, Rutland, VT, US, 802-773-8400