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Increasing Agriculture to Trade in India : Food Preservation & Efficient Distribution

India is a diverse and populous country. The geography features three coastal regions supported by fishing industries and many fertile grounds throughout the flat lands owned by inherited land farmers. The beauty of India comes from the regional diversity found in clothing, food and language between the four parts of the country: north, south, east and west. Despite the people's colorful culture and advances in technology, the basic lifestyle lacks progress. Generations of people have been surviving through harsh years since the country's independence. Poverty, malnutrition and lack of clean water are all areas where food security comes into question. Can food security stabilize the nation? Is it possible for people to eradicate slums and poor living conditions if a meal is guaranteed everyday? A step forward in answering such questions can be found by increasing: infrastructure for storage, education of farmers and productivity of crops. The country will benefit from heightened production because farmers will earn equivalent to how much they produce and be able to sustain their farms and invest in improved technology. The use of storage facilities and preservation methods will enable Indian farmers to provide more food to markets; in turn lowering the cost of food and making nourishment more affordable to the downtrodden. In a country where agriculture is the main source of income for over 52% of the 1.2 billion people living there, India is still unable to reach food security ("The World Factbook"). Although part of the issue comes from an intricate system, the simple implementation of basic food preservation techniques can prevent the loss of upto 40% of the grains, vegetables and fruits grown. The amount of food grown is substantial to feed most of India; however, due to small inherited farms, open back trucking of produce and interference by middle men, many farmers are not successful in selling most of what they have produced. This causes lower income rates and higher degrees of poverty (Westhead, "Why India...").

The ordinary Indian subsistence farm family follows a joint family structure ("Indian Family"). This structure is upheld to enable strong family values and to have every member work for the welfare of the whole family. A rural family consists of the parent generation, with usually three to five children. The grand parents, aunts, uncles and extended family live within the same house. This helps reduce the cost of living by having multiple incomes. The family usually eats one to three meals a day based on availability of food. The diet consists of cooked rice, flat breads, curried lentils and vegetables. Nutritional food are produced by Indian farmers; however, the lack of nutrition comes from the techniques used to prepare the foods: frying, crushing and, fermenting. Increasing awareness to healthier preparations can decrease the number of nutrients lost from fruits and vegetables.

Education is mandatory for all residents of India, and 95% of children attend primary school ("Edu. in India"). This does not guarantee that a rural child attends school for more than two to three years. The World Bank with the Government of India is supporting the increase of available schools and staff for teaching in rural communities. As of now education is being stressed as necessary at least until the fourth grade or "fourth standard" as it is referred to in India. This lack of consistent higher education, within rural communities, inhibits any new growth or improvement in farming and production. Since people are not able to access the proper education to improve their farming techniques, many potential ideas of commercialisation are left unused.

The average farm size is 3.3 acres and smaller due to farms being divided amongst family members. The three main products are wheat, rice and pulses often farmed using human labor, below basic technologies -hand operated ploughs, buckets of water etc.-and meager storage (“Welcome to Ministry”). Major obstacles keeping India’s agriculture industry from reaching full potential are: farmers’ education, farming technology and food preservation. In order to reach the millennium development goal set by the United Nations to increase agriculture to trade in India, the food produced must reach more consumers. A step in solving this issue is looking at ways to improve post harvest technologies from its current standing.

At present there are no mandatory storage, preservation or transportation regulations. In other words, produce maybe transported with no covering, touched by bare hands and shoveled into loads BEFORE reaching the consumer (Westhead, “Why India...”). Lack of sanitation and proper food handling are the main causes of wasted produce. In India more grain is wasted than the whole country of Australia can consume, and more fruits and vegetables are wasted than all of England can consume. (Westhead, “Why India...”). All of this loss can be prevented with safe handling education, and improved preservation techniques. With more produce being sold, the rural farmer will be able to better sustain himself and his family. After economic profit is made, after all expenses are taken care of, the same farmer may be now able to increase tools or technology on his farm to further increase production.

A new policy is currently being initiated to fund a National Agricultural Entrepreneurship Project, which allows private firms to help improve infrastructure in post harvest processing. (“Policy”). Food Processing Industries in India has proposed a twelve year redevelopment plan. Of this infrastructure, food processing has been stressed as a main goal for bringing in more money for agriculture sector. A basic study by The Associated Chambers of Commerce and Industry of India, shows that half of the food industry in India is backed by revenue from food processing plants. The fruit and vegetable market will increase its revenue by 79% by 2015 if food processing developments are made. (“Policy”). The trends for this factor are being positively changed. This way rural farm owners can implement technology from the private firms to increase the amount of produce traded and sold. With such enhancements the situation for rural Indian farm families will soon improve.

India needs the following post harvest technology in order to meet the UN millennium development goal for increasing agriculture to trade. More storage warehouses need to be made available for the rural farmer. This provides a facility for wheat, grains and pulses to be mass produced and evenly distributed amongst markets. This way a farmer on one side of a state is not having to trade his goods on the other side, reducing the risk of wastage and exposure to damage. A simple six step process, already being considered by the Indian government, can increase productivity and simmer down the variance in food produce inflation.

The government created the Warehousing Development and Regulatory Authority (WDRA) to improve storage and reduce the consumer’s burden of fluctuating prices. The six step process begins after the harvesting of produce. First the rural farmer takes produce to an authorized warehouse facility; second, the farmer “parks” his product by storing it in spaces provided until the market price is right for selling. Third, the farmer pays the warehouse owner after receiving the storage receipt. Fortunately in positive efforts to encourage this plan, banks are lending farmers loans based on the storage receipt. This allows farmers to settle the initial payment, and pay off the loan after revenue is made. The major advantage of

this process starts at step four. During this step, warehouse operators categorize every farmer's produce by quality and quantity. This allows warehouse operators to notify neighboring markets and private firms of the available fresh products; the store owners can then negotiate and purchase the produce straight from the warehouse. If a separate firm does purchase the produce, the farmer then transfers his receipt to the firm and has just accomplished step five. Lastly, farmers can truck stored produce to nearby markets or find local businesses to transact the storage receipt with. Using this method Indian farmers are in the highest advantage. The produce is stored well to last longer, the middlemen are cut out by this supply chain process and the farmer ends up with the better price for his product. The main drawback of this plan is that small land owners do not benefit from large produce markets and storage facilities. In order to make the smallholder benefit, these storage centers must be made available on a smaller scale in every rural sector to have the same effects. This allows more control over the market and better planning for unpredictable drought seasons. Small farmers can store produce in mini-warehouses and sell according to local market sales. This entails the farmer to still make an income when all production stops because the farmer would still have the produce from the past harvest in storage. The produce best suited for this plan are all grains: this includes rice, wheat and pulses (Mishra, "India's New Warehouses").

The amount of food reaching the consumer will greatly increase because less product will go to waste with increased storage. Farmers who do improve processing methods will benefit greatly by an increased income. This is justified by more produce reaching the consumer, in turn making a greater profit for the farmer even though the same amount of produce is being farmed. For example, previous to the initiation of storage facilities, farmers who made one hundred tomatoes would then have the unprotected produce sold to a middlemen who would then truck the exposed tomatoes to a marketplace. The middleman would sell the already 50% tarnished tomatoes to a seller at the market after putting in the cost of transportation and labor. The seller would sell the now only 25% untouched tomatoes to a consumer at a higher cost than the middleman. This vicious cycle of inflation can be cut down by giving more liberty to the farmer. Farmers have the ability to transport only the goods that will definitely be sold by using the mini-warehouse system. This in the long run will cut down the amount of pollution caused by trucks transporting wasted goods. The ultimate goal of this idea is to bring more product into the market so the supply goes up and the cost goes down. Demand for food will stay constant due to the need for survival, so by reducing the prices of fresh produce and by removing most of the waste goods, more food is affordable to the poor and downtrodden. The reduction of automobile pollution, poverty and waste product can all be accomplished by first implementing the mini-warehouses plan in rural communities.

Population growth is an evident cause of why India has not successfully eradicated poverty in the past 64 years as an independent nation. ("India's Independence..."). The number of people living in India grow by 1.34% each year and based on the spread of the data more than half the population is between the ages of 15 and 64. The median age of an Indian male is 25.6 years and an Indian female is 26.2 years ("The World Factbook"). This means the highest concentration of Indian citizens are quite young. In order to sustain production levels and keep prices from rising and falling constantly, the amount of produce made by the farmer has to correlate with consumer demand. As population increases, prices can only stay affordable if supply is greater than market demand causing a surplus of goods. (McConnell, 23). This surplus will then have to be priced cheaper in order to sell all of it. This needs to be brought up to smallholder farmers who plan on farming for the next couple decades. Smallholder education needs to be initiated so all farmers can be cognizant of the necessary precautions they must take in order to keep providing for their consumers. Farm families who do not consciously know about population growth and

higher demand will fall short of the required production. By raising prices of the crops they sell due to lack of supply and increasing demand, many of their consumers will be forced to go to other markets to find lower prices. This cuts the uneducated rural farmer out by competition. Without proper income the family will not be able to pay for storage facilities, crop maintenance or personal sustenance. This problem can be anticipated and solved if farmers are aware of their required production rate and produce enough to meet that requirement.

The best way to feed more people in India is to get more produce into the market after harvest. At present the people of India do not rely on canned foods for a majority of food consumed. In Himachal Pradesh, India, a private food processing company currently produces canned fruit, juice and puree products. One of the few processing plants in India, this company focuses mainly on the export of Indian fruits. If this concept of factory processing could be made into a government agriculture venture then the canned products could be circulated in the Indian markets and stores. Canned food has its benefits: long shelf life, easy transport and standard pricing. Infrastructure is important for the development of such a firm; however, the revenue created from the product itself and jobs created from factory labor requirements will influence more money into the economy eventually meeting the initial investments. (“Indian Exporters ...”). The factory would need to buy produce from local smallholder farm storage facilities to help sustain the community. In this way the food produced from small landowners is not only used by the consumer but also by large businesses.

Canned vegetables and fruit are shipped out to slums in India yearly by the World Food Programme. Major canned food firms in America or anywhere around the world should consider opening up in the Indian market. Firms like Dole in America or Qingdao Haimei Ltd. in China, are known for its canned food industries (“Processing”). If firms like these open up business partnerships and share knowledge to factories in India, canned food would become a prominent industry. With canned food out in the market, the under nourished people may have an alternative cheaper method of purchasing food. The canned food industry does rely heavily on machines and technology not currently available in India; which is why private international firms should enter the market with preexisting resources. These industries need large food producers to run, but it would greatly benefit the local farmers and communities if a percentage of produce is purchased from there as well. The canned food industry has potential to create many jobs for unemployed and poor farmers.

The main concern for India’s food scarcity issue is that much of the food produced is not consumed. To better improve this ratio more storage facilities need to be accessible by the rural farmer to sell his produce in a timely fashion. By increasing the canned foods available in India, malnourished children and adults have a cost efficient way of finding food. The shelf life of canned foods allow organization like World Food Programme and World Health Organization to distribute canned foods being made in India to those who need it most within the country. Increasing awareness to post harvest technologies can potentially pull out all the produce wasted in India. There is tremendous progress being made by organizations like MSSRF (M.S.Swaminathan Research Foundation), that have been instrumental in educating the farming community of safe but sustainable agricultural practices, biotechnology and other scientific advances to the grass roots level. Incidentally, Mr.M.S.Swaminathan is the first recipient of World Food Prize, who is also regarded as the Father of Evergreen revolution in India (“MS Swaminathan”). India will make a huge leap in delivering social programs to the needy once the unique identification numbers are rolled out by UIDAI (Unique Identification Authority Of India). It is a huge

project being implemented to provide a unique 12 digit identification number, called Aadhaar, to all 1.2 billion people of India with biometric identification like finger print and iris scans. Once implemented, the supply chain for food distribution by civil supplies corporation of India can be streamlined. Vast improvements in avoiding duplication and systemic failure due to fraud can be identified and corrected. It is a gigantic project but with able leadership and advanced technology there is potential. It will result in efficient service delivery and enhance overall utilisation of resources, especially to supply needed seeds and fertilizers for farmers ("Identification"). Agriculture and trade are still developing aspects of the Indian farming system. The combination of development from the above proposals is a step in the right direction. The contributions of innovative minds and international organizations will shine a new light on these challenges and make post harvest techniques available to farmers in India.

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