ENABLING SMALLHOLDER PROSPERITY:
ZAMBIA'S SMALLHOLDER MILK COLLECTION CENTERS

Submitted by:

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Abstract:

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In August 2001, USAID through the **Zambia Agribusiness Technical Assistance Center** (ZATAC) initiated a pilot effort to test the feasibility of selling surplus milk by smallholder producers, who were not engaged in significant milk trade even though they owned vast number of cattle. The demand for fresh milk by commercial processors was on the rise due to expanding local and regional markets, and also due to interest in substituting imported milk powder. The ZATAC Project linked this ready market of milk processors to smallholders, so that they could deliver their milk and become a part of the Zambian processed milk value-chain. In less than 2 years, this pilot effort was successfully replicated in 9 additional areas. In the first 1.5 years, this smallholder dairy program engaged over 1000 smallholders, who contributed about 2 million liters to the market, of which 40 percent was sold to dairy processors, while the rest were sold directly to consumers in market centers where they received higher prices. Today, this program has expanded to 7 more areas across Zambia through funding from SIDA, bringing the total number of ZATAC-facilitated milk collection centers to 17. Additionally, because of ZATAC Ltd's smallholder dairy program, seven milk collection centers jointly and profitably own a dairy transport company, established to overcome their milk transport constraints. The rapid growth in the number of such collection centers facilitated by ZATAC is continuously being informed by inherent development experience that has made it possible for ZATAC to upgrade and launch milk collection centers that are increasingly more competitive. Programs such as these not only help break the cycle of poverty but also encourage an *esprit de corps* among smallholders to help them rise above their circumstances to achieve commercial success and individual prosperity.

I. INTRODUCTION

Zambia is a landlocked Southern African country, with a population of ten million people. Zambia attained political independence from Britain in 1964 and adopted a predominantly socialist development agenda that sought to enhance the level of indigenous participation in economic development. Economic policy centered on import substitution as the vehicle for industrialization. Despite experiencing the highest growth rates in Africa in the first ten years of independence, the collapse of copper prices, escalation of oil prices, and commitment toward the liberation of Southern Africa contributed to Zambia's progressive economic decline and stagnation. The World Bank now classifies Zambia as a severely indebted, low-income country. It is ranked 153 out of 173 countries in the 2002 UN Human Development Report.

Since 1991, Zambia has pursued policies of economic liberalization and structural reform programs that have transformed the country from being a centrally planned economy to one of open market. These changes have now opened new opportunities for growth and prosperity for Zambians.

ECONOMIC CONTEXT

Zambia's economic development is constrained by its narrow economic base, historically dependent on copper mining, concentrated ownership of assets, limited foreign and domestic investment and a relatively high incidence of corruption. Zambia's recent economic performance indicators show that the nation's key macroeconomic challenges include sustaining economic growth, reducing inflation and interest rates, stabilizing the exchange rate, improving the weak balance of payments position, reducing the budget deficit and addressing the high domestic and external debt burdens.

In recent years, real GDP growth has averaged 3.9% and this sustained economic growth has been achieved against a backdrop of recovering copper mining sector, positive performance in non-traditional exports, retail/wholesale trade, transport, manufacturing, construction and tourism.

Although agricultural commodities have been the fastest growing category of non-traditional exports, agricultural performance continues to be generally poor due to an over dependence on rain-fed agriculture, which has suffered recurring droughts since 1991. Despite Zambia's huge potential in the agriculture, including livestock, and natural resources sectors, the country has been unable to register itself as a competitive market player locally, regionally and internationally. Many constraints contribute to the low competitiveness and weak performance of the Agriculture, including the livestock, sector, for example poor access to markets, finance, inadequate infrastructure, inconsistency in the government's agricultural policy framework, widespread livestock disease, high cost of feed, and high prevalence of HIV/AIDS.

II. THE DAIRY SUBSECTOR

Zambia's dairy sub-sector is experiencing growth as a result of increased population and consumption of dairy products. Despite the growth, domestic consumption remains relatively low in Zambia. Per capita milk consumption in Zambia is estimated at 15 liters/capita/year and is lower than the FAO recommended consumption of 45 liters/capita/year. In addition to domestic demand, Zambia has been exporting milk to its neighbors, primarily the Democratic Republic of Congo. It is estimated that the country's total milk requirement is approximately 253 million liters per year (Emongor, 2004). However the country has generally been facing a shortfall in milk production given that domestic production meets only 75 percent of demand at 190 million liters per year, reflecting a 25 percent deficit. This deficit is covered by importing powder milk from New Zealand and long life milk from South Africa and other countries (Emongor, 2004).

Not unlike other African nations, 70 to 80 percent of all milk consumed in Zambia is sold directly to consumers in local, open markets. Approximately 20 to 30 percent is processed by the commercial dairy processing industry. While no proper statistics are available, the Directory of Processors indicates that there are about 19 milk processors in Zambia, many of which are either medium or small in size (Emongor, 2004). The increase in the number of processors, since the reform of the 1990s, has led to significant product differentiation resulting in increase in demand for fresh milk. While a majority of the nation's milk supply is provided by traditional herds held by smallholders, little of it enters the formal commercial dairy channels (LDT, 2004). The bulk of milk supplied to the formal dairy processing industry is overwhelmingly produced by commercial farms, using improved breeds, dairy feeds, and modern technology.

CONSTRAINTS TO SMALLHOLDER PARTICIPATION

Smallholders in the traditional system have generally been unable to enter the formal dairy channels due to various constraints, contradictions, and cultural practices. The traditional milk producers, who own over 90 percent of the cattle in Zambia, are really beef cattle producers. Milk production for many of the traditional smallholders is a by-product of beef cattle production. Most of the indigenous herds' milk is consumed primarily as a production input to suckling calves, therefore making fresh milk fairly unavailable for commercial sale. Consequently, the smallholders do not actively work to improve milk yield, volume or quality, which is evident in the average milk yield of about 2 liters per day per cow. Productivity per animal is therefore of minor importance, perhaps because traditionally smallholder farmers believe in numbers of animals and only producing enough for their families rather than for sale (Humpal, 2003). As a result, modern dairy practices and technologies were not developing to any significant extent. The adoption of modern technologies, such as artificial insemination and the evolution of effective smallholder cold-chains have similarly lagged behind. Cattle breeding research and propagation of breeds for smallholder farmers have tended to focus on developing cross breeds for beef production. The net result of these circumstances is very low productivity in the smallholder dairy sector.

Another factor constraining the potential of smallholder dairy development is cattle diseases. The control of cattle diseases remains a major concern in Zambia, particularly in Southern and Western provinces, which are Zambia's two major cattle producing provinces. Angola, which neighbors Zambia on the west, remains a leading source of cross-border cattle diseases. The civil war in Angola had made it literally impossible to undertake any meaningful international collaboration to combat cattle diseases. Any efforts to control disease on the Zambian side of the border were regularly undermined by lack of corresponding actions in the neighboring state. Cross-border trade in beef animals have contributed to cross-contamination resulting in lower milk availability.

Interestingly, while cattle remain the pride of Zambian smallholders, efforts to improve cattle health and nutrition seem not to be a priority. There is little effort to expand communal pastures in order to sustain feed supply, during the drought season, especially after crop residues have been consumed and grasslands have been burned. Consequently, cattle go stressed for over 5 months of the year.

Globalization and the liberalization policy reforms have also played their part in Zambia's dairy sector development or lack thereof. For example, the policy reforms of the 1990s made it easier for dairy processing companies to import powdered milk from the developed world. This meant that smallholder milk producers had to compete with cheap powdered milk imported from countries where dairy farmers benefit from agricultural subsidies. This unfair competition that smallholders in Zambia are enduring against developed economies subsidies remains an issue. Because of cheap powdered milk, the smallholder farmers therefore generally receive fairly unattractive prices for their fresh milk from the formal dairy processing sector. They consequently prefer to market fresh milk directly to consumers in the traditional or informal, open markets in order to realize a better return on their investments, no matter how small.

Furthermore, because the smallholder producers generally tend to sell only surplus milk, the lack of volume discourages them from marketing their product to the formal sector. It is therefore difficult to address public food safety concerns under these informal circumstances. Moreover, the regulatory framework for management of the dairy sector also remains weak, particularly in the area of ensuring enforcement of public health guidelines to ensure food safety in smallholder milk marketing. This weakness has disadvantaged smallholder milk producers because it has provided milk processors the opportunity to raise questions and cast doubts about quality.

But most importantly, a vast majority of the traditional smallholders have been left on their own, in terms of establishing linkages to dairy processors as a marketing strategy to meet the nation's milk demand. Despite the emergence of more efficient private dairy processors, these have tended to concentrate in urban centers where they are closer to larger numbers of consumers as well as to infrastructure that makes it possible for them to manage their cold chains and market their products more competitively. Consequently, few smallholders were aware of the benefits that could accrue to them in participating in milk production as a business. For those that knew of this avenue, the marketing systems and infrastructure were not in place to support the enterprise. For example, smallholders have to cover significant distances to get their milk to dairy processors and urban markets, which translate to very high transaction costs. With little or no support systems in place, smallholders suffer poor terms of trade under which trade at very low prices from processors turn out to be disincentives. Production and marketing of key livestock products like milk by smallholder producers have received inadequate attention as a result and this has led to the continued presence of a vacuum in reliable marketing channels, not to mention the continued poor quality of products which in turn have contributed to low commercial value making it very difficult for smallholders to operate dairy activities competitively.

DAIRY DEVELOPMENT ASSISTANCE

The development community has made many attempts to break this vicious cycle and promote smallholder dairy development. During the 1970s, the government introduced dairy schemes to encourage smallholder participation in commercial dairy production (Kaluba, 1992). In the late 1980s/early 1990s, the World Bank funded the Smallholder Dairy Development Project (SDDP), through which farmers were organized into cooperatives to collectively establish milk collection centers. While the government-funded dairy schemes have since failed, the SDDP's results have been mixed (Kaluba, 1992). Two of four SDDP assisted cooperatives collapsed when the development aid project pulled out; the other two milk collection centers survived the economic pressures but never quite flourished (Humpal, 2003).

In 2001, USAID through the ZATAC project made another attempt to help re-stimulate Zambia's smallholder dairy sector. Today, because of the USAID effort, the smallholder dairy sector is reviving and successfully making a difference in the lives of smallholder cattle producers. In less than two years, the USAID-funded pilot effort was first successfully replicated in 9 additional areas, bringing the first batch to a total of 10 smallholders-owned-and-operated milk collection centers. These 10 centers engaged 1,000 smallholder producers, who contributed close to 2 million liters of fresh milk to the market, 40 percent of which was sold to formal processors. Because of the demonstrated success of the USAID program, other donor-supported dairy programs and projects targeting smallholders have since begun to emerge. Today, there are a total of 17 such milk collection centers established through ZATAC Ltd, with additional development funds from CARE International, SIDA and the Government of Zambia.

OPPORTUNITIES FOR SMALLHOLDER COMMERCIALIZATION

The success of the USAID/ZATAC effort in reviving the smallholder dairy sector was driven by two factors: a rise in milk demand, and a technical approach that focused on harnessing the commercial potential of smallholder producers. In other words, the USAID/ZATAC project developed models that helped smallholders maximize the resources and skills they owned, managed or brought to bear toward improving their lives. For example, the long tradition of cattle keeping in Zambia has led to the development of a significant local knowledge base for animal husbandry. This tradition and skill-base provides an opportunity that plays to smallholder commercialization since it easily presents a good point of departure for the implementation of smallholder dairy projects. This resource-base was tapped to begin the formation of target groups consisting of smallholders who owned cattle to help enhance economies of scale for commercial milk production.

The approach of having smallholders milk their indigenous herds, without further investments in new breeds, has two fundamental advantages:

a. The farmers make money from the sale of milk throughout the year without expending significant investment in dairy breeds. With only a little additional care of traditional herds to help promote good cattle health, good fodder and use of crop residues as supplementary feed at the beginning of the dry season, milk volume could be easily tripled.
b. As milk sale increase, farmers can have the resources to secure veterinary drugs vital to sustaining and improving herd care. Improved herd health has been known to lower mortality rate, resulting in increased herd size. Improvement in cattle health and the number has translated into more money for cattle producers from sale of both meat and milk.

This incremental approach to increasing production and productivity has provided the smallholders the opportunity to understand and learn the enterprise well before committing larger investments. As has happened in some locations, smallholders are slowly beginning to invest in dairy activities, switching traditional cows with mixed-dairy breeds to increase milk volume.

The successful integration of smallholder milk producers in the commercial milk value chain has provided strong incentives for smallholders to invest in dairy activities. This has also led to a significant opportunity, in the form of the Government's launching an official cattle restocking program, to help smallholder producers restore their cattle herds lost to endemic disease, particularly in the late 1980s and 1990s when public support to animal disease control all but ceased to function effectively. Because of this market opportunity and success established in the smallholder milk sector, the Government has shown interest in distributing dairy breeds in its restocking program to further expand the sector.

The Zambian social/community structure also lends itself well to successful commercialization of smallholder production. The social groupings and clustering of households in a village setting offers the opportunity to more easily and efficiently organize producers into groups or cooperatives to build economies of scale and lower transaction costs particularly given the highly perishable nature of milk. USAID/ZATAC mobilized 17 such groups of smallholders around cooperative enterprises and equipped each with milk cooling capability to collect fresh milk every morning from its members to bulk, chill, transport and sell to local commercial processors. These milk collection centers offer smallholder milk producers an outlet to sell their milk, however little, and as a cooperative member, the opportunity to earn dividends at the end of the year. Since 2002, smallholders have begun to earn a decent living from their participation in these programs and in turn have begun investing in higher yielding animals, improved production and marketing practices, for example the creation of a dairy transport company to overcome their milk transport constraints.

The USAID/ZATAC smallholder dairy commercialization model is widely adopted as a successful approach to help smallholder producers work themselves out of poverty, enhance profitability, and create prosperity in the sector.

III. COMMERCIALIZATION OF SMALLHOLDER DAIRY PRODUCTION

The USAID/ZATAC smallholder dairy commercialization model differed from other development assistance approaches in several ways. *First and foremost*, the USAID/ZATAC approach was based on a very simple premise: **Being market oriented.** Market orientation was driven by first assessing demand and actively promoting and sealing market linkages to meet the demand. This meant organizing smallholder milk producers who had the milk to connect and communicate with dairy processors who demanded raw milk to enable the milk industry to meet the nation's fresh milk demand domestically. Establishing such linkages offered smallholder producers the opportunity to be partners in a value chain, while offering the processor the chance to increase its supply base and benefit from economies of scale without the associated capital investment. *Second*, market linkage efforts were backed up with a comprehensive package of technical and financial assistance, which helped smallholder milk producers meet their market (buyer) obligations and technical requirements. *Third*, the concept of farming/dairying as a business was one of the first essential message continually driven home, which was repeated through training on business and management skills, record keeping and budgeting.

THE ZATAC PROJECT

Implemented by Development Alternatives Inc. (DAI), under the USAID/Zambia Strategic Objective "Increased Rural Incomes for Selected Groups", the Zambia Agribusiness Technical Assistance Center (ZATAC) Project was launched with a mission to commercialize and diversify small-scale farmer production, processing, sales and trade in Zambia. This 5 year (Aug.1999- Feb 2005) $6.6 million project was premised on the development hypothesis that "Linking smallholder producers to profitable markets, while providing them with technical assistance and business development services, will lead to increased and sustainable incomes for the smallholders." ZATAC's successful smallholder commercialization approach has resulted in many households benefiting financially and cooperative-businesses profiting commercially. In the dairy sector, many of the 17 milk collection centers are well on their way to becoming profit-making small businesses.

THE ZATAC APPROACH

The ZATAC technical approach for successfully commercializing smallholder dairy production involved evaluating the commercial potential of smallholder production, followed by unlocking constraints to commercialization, whether be it helping smallholders transition from viewing milk as a casual by-product to a cash-earning commodity or establishing milk-chilling centers to add value and maximize returns to labor and investment. ZATAC strategy also involved striking business deals and establishing formal linkages between smallholder cooperatives, processors and institutional buyers that sought to enhance their supply base. Under the smallholder dairy program, such linkages were tied with the establishment of the milk centers to gain from economies of scale and lowered transaction costs.

Central to the commercialization strategy were (1) the identification, mobilization and strengthening of the smallholder producers/communities resulting in the development/strengthening of formal group businesses in a manner that addressed production, financial management and marketing training needs, as well as good corporate governance; and (2) the identification of affordable, appropriate and efficient systems that added value so smallholders could work themselves out of poverty. For example, in the smallholder dairy program, ZATAC helped overcome the "milk-collection and value-adding" constraint by providing (a) credit for establishing the milk-collection centers equipped with chilling tanks, milk cans, and milk-quality testing kits; (b) training smallholder producers and their cooperative executives on three tracks: technical skills (focused on animal husbandry, milk hygiene, and quality control among others), business and management skills (included training on farm budgeting, book-keeping, record keeping, coop-level business and financial management, markets and marketing), and organizational development to help raise collective consciousness toward the utility of group formation by pooling resources and building solidarity to help them successfully transform their cooperatives into profitable enterprises utilizing sound business principles and returning stable inflow of income.

Because of the financial support and linkage services, including provision of credit for collection-center equipment, smallholders are now able to better utilize the resources they own. As a result, smallholders began obtaining improved breeds, diversifying into dairy animals, and employing artificial insemination technology to further expand the chances of increasing their income. Additionally, with technical assistance from ZATAC Limited, the milk collection centers, owned and operated by the community cooperative of producers, are continuing to operate as self-sustaining and profit-making small business.

The simple provision of credit and training, tied with ready buyers, provided the recipe for unleashing their potential. This type of market-linkage has worked well in Zambia since it is not only increasing real income for smallholders but also providing an avenue for repayment of the credit. With ZATAC's assistance, equipment credit availed through the ZATAC Investment Fund (ZIF) is channeled to smallholders via their producer-cooperatives and further guaranteed by the ready markets or processors that ultimately purchase the milk. As part of the relationship, the processors help remit repayments to ZATAC on behalf of the cooperatives and their member-producers. ZATAC has successfully demonstrated that when production activities are tied to ready markets that assure a reasonable return, investments pay off. ZIF is a financial instrument established through USAID/ZATAC but since project closure in February 2005, it has been locally managed by ZATAC Limited. ZATAC limited, is a Zambian non-profit organization also established through USAID/ZATAC as the project's exit strategy and legacy institution with a mandate to continue the support and promote the commercialization of smallholder production and provide technical assistance to small and medium-sized businesses that work with or support rural smallholders so that rural poverty is reduced.

THE SMALLHOLDER DAIRY COMMERCIALIZATION PILOT

In 2000, only three milk collection centers existed in Zambia. Located in Siinde, Monze and Magoye districts of Southern Province, these three centers remained small for a long time with a combined membership base of 180 smallholders and annual production of 246,000 liters of milk.

In August 2001, the USAID/ZATAC Project, seeing the opportunity to promote more milk collection centers in Southern Province, initiated a pilot effort to test the feasibility of engaging traditional beef-cattle producers in milk production. A pilot milk collection centre was successfully established by the project in Kazungula District in November 2001. Under this pilot, a dairy cooperative was also established, formally registered, and provided with capacity building through training in milk production and hygiene, production, record- and book-keeping, financial management, marketing and corporate governance to ensure proper management of the center. The centre was constructed with community participation and fully equipped with a 2400 liter bulk chilling tank, cans, testing equipment and related equipment funded by the Japanese Government.

A market linkage was facilitated for the collection center to deliver milk to FINTA Danish Dairies, a large-scale private milk processor based in Livingstone, Zambia's tourist capital, located 85 km from Kazungula. In the first year alone, the pilot center was able to attract the participation of 30 farmers in marketing of milk where there were none before. In all, the farmers delivered 61,060 liters to the collection center in the first year, averaging just over two thousand liters per farmer. Milk that represented a by-product of their beef cattle had suddenly been transformed to a source of income. The smallholders were so encouraged with the income that some traditional cows were sold off to purchase improved dairy breeds to increase milk production. The success of this pilot resulted in USAID funding a smallholder dairy program to replicate the concept in 10 new areas of Zambia.

IV. ENABLING SMALLHOLDER PROSPERITY: REPLICATING FOR EXPANDED OUTREACH

FIRST GENERATION INTERVENTIONS

Based on the positive results of the pilot, the ZATAC Project created ZATAC Ltd in April 2002 with its first assignment to replicate the ZATAC model and develop 10 milk collection centers in cattle-rich areas, two in Lusaka province and 8 in Southern Province. The intervention was funded by USAID through the Zambia Dairy Enterprise Initiative, a two-year smallholder dairy program.

RESULTS – PARTICIPATION, OUTPUT, INCOMES, AND CHALLENGES

By the close of the two-year, $350,000 project, all the 10 milk collection centers were fully functional, 7 being totally new while the Siinde, Monze and Magoye centers were significantly strengthened. On average, 32 farmers were delivering milk to each of the 7 new milk collection centers, while the 10 milk collection centers grossed an average of 1,188,060 liters of milk per year over the two-year period of the project. This represented a dramatic annual increase of close to 400% of milk marketed by smallholders through the new value-chain. At current prices, the smallholders were marketing just over $400,000 worth of milk per year, well above the total project costs of $350,000 over two years. With a total of 455 farmers delivering milk to the 10 centers per year, this represents an average annual income of $ 895 per farmer per year, which is well above the national per capita income of about $400 a year.

Despite these successes, this first generation of milk collection center interventions was very instructive on the challenges that remained to be resolved:

a. Production of milk being from traditional beef cattle, the yields of milk were very low, with farmers milking an average of about 2 liters per day per animal.
b. The absence of satellite milk collection points often meant that many farmers traveled large distances to reach the milk collection center. In some cases, this became an important factor in the inability of some farmers to deliver fresh milk.
c. Availability of good pastures tended to coincide with the rainy season, such that milk production drastically fell in the dry season to as low as a tenth of the levels recorded in the wet season.
d. Farmers also migrated their cattle to riverbanks and wetlands in the dry season in search of water and pastures, reducing the number of animals available to supply milk to the centers.
e. Ironically, during the rainy season, some farmers become cut off by floods making it difficult for them to reach the milk collection centers.
f. Dependence on state veterinary services often meant little or no reliable and adequately responsive veterinary services for the cattle.
g. Unreliable transport systems, where private transporters in the rural areas tend to be few and far between, unreliable and expensive, resulting in milk quality being put at risk and producer margins being reduced by high transport costs.
h. The high marketing margins accruing to processors of fresh milk, combined with imports of cheap powdered milk, suggest that the farmers may be receiving unfairly low prices for their fresh milk. According to the farmers, price has been and continues to be a significant constraint to increasing overall participation by cattle keepers in milk collection centers.

SECOND GENERATION INTERVENTIONS

Armed with experience, ZATAC Ltd sought to pragmatically address most of these constraints in its second generation of milk collection center development interventions implemented through the Smallholder Livestock Intensification and Commercialization Initiative (SLICI) funded by SIDA under the Agricultural Support Programme (ASP).

The SLICI was launched as a medium term project with an investment phase of 18 months. The Initiative, structured as a tripartite partnership between ZATAC Ltd, ASP and the Livestock Development Trust (LDT) of Zambia, was launched in 2004 so that smallholders in other provinces of Zambia also could have the opportunity to participate in and benefit from the replication of the second-generation smallholder dairy commercialization model. The second generation model is a modified version incorporating the lessons learned from the first generation model. Apart from leveraging the specialized technical and professional competencies of the three partner institutions, the SLICI directly addressed the challenges facing the first generation of interventions as follows:

a. To increase productivity and yields of milk per animal, pure breeds of Friesian and Jersey dairy cows were distributed to participating farmers. This was intended to dramatically increase the volumes of milk delivered by each farmer, translating into a corresponding increase in income.
b. To address the problem of covering large distances to the centers, such that in some cases the quality of milk deteriorated on the way, a zero-grazing regime was introduced for dairy cows.
c. To address the problem of non-availability of good pastures in the dry season, community based pasture multiplication was promoted. A direct provision of dairy feed supplement on credit was also made available to the smallholders. This, combined with zero-grazing, was intended to effectively resolve the seasonality in milk production thus securing incomes year-round.
d. To address the problem of lack of access to veterinary services, farmers at each milk collection center were linked to available Government veterinary doctors and veterinary assistants with a view to eventually develop a commercial relationship between them as the milk collection centers developed the capacity to pay for services rendered.
e. To address the problem of unreliable yet expensive transport services, ZATAC helped 7 milk collection centers come together and set up a commercialized milk transport company to provide fee-based services for transporting milk from the milk collection centers to purchasing milk processors. A 7-tonne truck was made available by ZATAC on loan to the milk collection centers and a business plan for the transport service was developed in a participatory manner.
f. The challenge of increasing farmer incomes was to be addressed by increasing production volumes as earlier mentioned.

RESULTS – PARTICIPATION, OUTPUT, INCOMES, AND CHALLENGES

At the end of Phase I of SLICI in December 2005, 5 new milk collection centers had been constructed and 2 existing centers were strengthened through increased attention to quality at the centers. The second-generation milk collection centers thus came equipped with fly screens and an airtight separation of rooms for selling sour and fresh milk respectively. An alizorol test was also introduced for testing milk freshness apart from just using the alcohol test.

A total of 210 farmers, 30 from each milk collection center, were mobilized and trained in improved dairy management. All 7 milk collection centers were fully functional, 5 (located in Mbala, Mpika, Mpima, Chinjara and Mabala districts) being totally new while the two existing centers (Zimba and Kazungula) were significantly strengthened. Though barely at inception stage, some milk collection centers have already started registering around 10,000 liters of milk per month within the very short period of commencement and while many animals had not yet entered production. This remarkable performance promises to easily double in year 2 and treble in year 3 as the farmers come to grips with zero-grazing and strengthen their capacity to mange pure-breed dairy cows.

The results of ZATAC Ltd's second generation of milk collection center interventions validate the hypothesis of the ZATAC model that "Linking smallholder producers to profitable markets, while providing them with technical assistance and business development services, will lead to increased and sustainable incomes for the smallholders". Incomes per farmer are being demonstrated to increase as the level of technical assistance and business development services increases.

V. Lessons Learned

The very positive experiences of the first and second generation of ZATAC milk collection center interventions have drawn the following lessons and challenges in development experience:

a. Linking smallholder producers to markets through milk collection centers provides a powerful platform for commercializing small-scale dairy farming.
b. Business/Market linkages quicken the pace of success for smallholder agribusiness development, particularly when struck between buyers/sellers who could benefit from a long-term relationship due to mutual needs--whether be it production, technical or marketing need.
c. The success of the Zambia smallholder dairy development programs can be attributed to the holistic approach that was taken to ensure smallholder dairy development success. This comprehensive package included addressing not only marketing issues, but also production, financial, transport, and training needs, at both farm and firm levels, to ensure success.
d. Dependence on traditional beef cattle for milk supply makes the business of maintaining a milk collection center vulnerable to difficulties of upholding consistency in supply.
e. Smallholder producer cooperatives must learn to diversify their enterprise portfolio in order to maximize their sunk-resources and meet cash needs. Those that have diversified have done well financially. With the success of their enterprises, Cooperatives are increasingly seen willing to guarantee loans their members take to increase on-farm production.
f. Transitioning into high high-yielding dairy cows induces potentially rewarding high volumes of milk but not without the challenge of increased costs of production that can be offset by higher milk yields.
g. Whereas Friesian cows yield about double the amount of milk per cow per day compared to Jersey cows, the Jersey has a marginally better dry mass conversion ratio of feed into milk, meaning that overall, it is twice as expensive to feed a Friesian cow per day as it consumes twice the amount of food to produce twice the amount of milk compared to a Jersey given that the conversion ratio of food is almost similar. The Jersey is also more heat tolerant than the Friesian. Under the circumstances, a Jersey has been found to be more appropriate for the Zambian smallscale dairy farmer as it costs less to maintain, is just as profitable and is more resilient to the Zambia's environmental conditions.
h. For the zero grazing regime, it has been found that procuring home mix concentrates and training the farmers to prepare feed/silage can reduce the cost of supplementary feeding by as much as 25% compared to using premixed concentrates.
i. Availability of pasture seed tends to be difficult in Zambia. It is recommended that seed must be sought as early as possible and community-based pasture multiplication programs be put in place if the program is to produce sufficient pasture for the dairy cows
j. The higher costs-higher volumes frontier of introducing dairy cows may justify new thinking in terms of the plausibility of migrating smallholders into milk value-adding/processing activities.
k. A promising solution to the problem of lack of access to veterinary services could be linking to the available Government veterinary doctors and veterinary assistants, with a view to eventually developing a commercial relationship between them as the milk collection centers developed the capacity to pay for services rendered
l. It has been found that training farmers to mange dairy animals well is a process that needs time. The shift from traditional cattle rearing to specialized dairy production appears to require at least three years of TA to raise the farmers' animal husbandry capacities to appropriate levels.

VI. Conclusion

These challenges mentioned above have in common the fact that resources necessary to resolve them can only be financed sustainably if they are paid for directly by the farmers through their milk collection centers, otherwise subsidies and other such transfers can only postpone the problem. Value added processing presents the clearest prospect for increasing producer prices to income levels that could stimulate high levels of participation and production by the farmers. At high production and income levels the milk collection centers would then start retaining margins significant enough to raise resources to pay for such requirements as systematic veterinary services, concentrates for onward sale to members, acquiring transport etc.

Whereas the seasonality of the first generation of milk collection centers severely constrains the prospects for value-added production at milk collection centers, the second generation of milk collection centers resolves both the problems of volume and of seasonality. Where other market conditions, such as adequate effective demand, can be met, it can be concluded that service providers such as ZATAC Ltd and its partners should step forward and help Zambian smallholder dairy farmers make the ultimate transition to economic emancipation through participation in small or medium-sized dairy processing.

Whereas the second generation of milk collection centers clearly addresses important constraints inherent in the first wave of center development, it raises a host of pertinent issues. One amongst these is the question of process. If the first generation of centers logically transitioned into the more intensive second generation, then is the second generation of centers an end in itself or a pre-requisite for a more advanced and even more sustainable conclusion?

If increasing competitiveness through dairy cooperatives was to be informed by the evolution of the dairy industries in India, Holland, USA, New Zealand and, closer to home, Kenya, then the pattern would seem to suggest that value-added processing may indeed plausibly constitute the third wave of smallholder economic empowerment in Zambia.

The persuasion of development actors varies greatly in Zambia with no tangible common ground having been struck on the way forward on this matter. At ZATAC Ltd, our experience suggests that no one-size-fits-all. Many cattle rearing localities remain unsuitable even for introduction of first generation-type milk collection centers. Others are suitable for second-generation interventions without being able to muster the volumes or the direct markets to make value adding processing a profitable prospect. Others have all the ingredients in place, and have already ascended to second-generation interventions, but simply lack sufficient dairy experience to engage processing. The options for smallholder processing participation would include acquisition of existing plants, win-win equity positioning, launching new ventures, leasing etc.

Whatever the answers to these questions, what is clear is that the current marketing and processing arrangements have opened up opportunities for smallholder cattle producers to transcend from selling milk as a by-product of traditional cattle to becoming small-scale dairy farmers. However, questions remain regarding the potential of the smallholder dairy sector to advance exponential smallholder-driven growth of the dairy sector in Zambia, due in light of the challenges that are posed by the uneven applications of agricultural and trade policies, vis-à-vis agricultural subsidies.

VII. References

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