

GAIN: Andhra Pradesh

A Case Study on the Andhra Pradesh Foods Investment



Established: 1974

Location: Hyderabad, India

Vision: “To strive, excel and emerge as the best food manufacturing unit in the public sector in the country producing quality and nutritious food by incorporating the best practices against the competitive market in the industry.”

Mission: “To serve poor undernourished among underprivileged group of women and children, to facilitate implementation of ICDS projects and other Government schemes, and to simultaneously expand and diversify to sustain as a viable corporate industry.”

Executive Summary

Andhra Pradesh Foods (AP Foods) is a unique government-owned organization in the state of Andhra Pradesh, India with the mandate to manufacture and supply supplementary food under India’s Integrated Child Development Services (ICDS) program.

Dr. Rajan Sankar, Country Manager of GAIN India, first approached AP Foods in 2008 about working together to scale up and improve the AP Food’s centralized approach to producing fortified supplementary foods. GAIN and AP Food’s collaboration has led to significant improvements in product quality and packaging. Additionally, GAIN’s investment and expertise acted as a catalyst for substantial financial commitment from the State government to build a world class centralized production facility.

AP Foods’ approach to supplementary food production is a strong example of how GAIN’s nutrition partners learn from and use business-centered practices to achieve improved quality and efficiency within public sector or non-profit organizational contexts.

Key Takeaways

- *Prioritizing product and operational quality is critical, but organizations must consider the financial implications of decisions, and operate within their established constraints, to achieve long-term sustainability*
- *Targeting investments that drive long-term value without neglecting short-term opportunities is key*
- *Integrating production with the demand end of the supply chain can enhance the impact and sustainability of a nutrition intervention*
- *Measuring the nutritional impact enables a greater understanding of investment effectiveness and allows GAIN to more easily demonstrate success*

GAIN: Andhra Pradesh

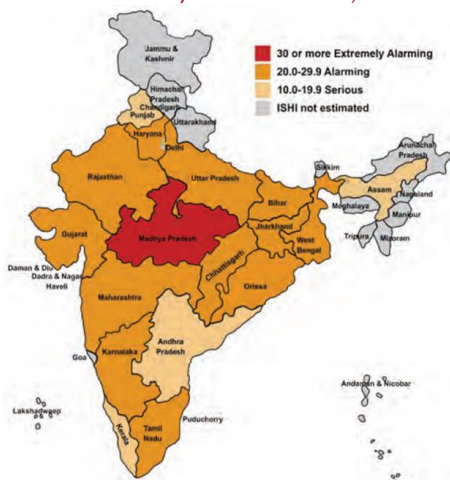
A Case Study on the Andhra Pradesh Foods Investment

Background & Context

In 2005, the last time a comprehensive national study was conducted, almost half of children under the age of five in India were considered “stunted” or too short for their age, indications that they had been undernourished for some time.

Twenty percent were considered “wasted,” or too thin for their height, and forty-three percent were generally underweight¹. Perhaps most telling, is that as of 2008, India still ranked worse than most sub-Saharan countries on the Global Hunger Index, with 13 of its 17 major states (accounting for 95% of the population) falling into the categories of “alarming” or “highly alarming².”

Figure 1 – Map of India State hunger index, by severity (International Food Policy Research Institute)



In India, nutritional aid for children, pregnant women, and lactating mothers is provided primarily through the *Integrated Child Development Services (ICDS)*. It is an outreach program sponsored by federal and state governments that includes a highly decentralized network of community education and aid centers targeted at women and children. ICDS provides education, healthcare, and nutrition services to local communities through a system of 1.3 million Anganwadi centers (AWCs). These centers are also the primary means by which the supplementary food is distributed to beneficiaries.

The government of India universalized ICDS with a

“Contractors shall not be used for supply of nutrition in Anganwadis and preferably ICDS funds shall be spent by making use of village communities, self-help groups and Mahila Mandals for buying of grains and preparation of meals.” - 2004 Supreme Court Order

Supreme Court Order in 2001 that directed the scheme to be fully implemented, though little was done to make progress. Then, in 2004, the Supreme Court issued additional orders that received significant attention and spurred a shift in the policy environment in which nutritional programs operate. A key order focused primarily on excluding contractors; however, this order has been widely misinterpreted as a mandate against centralized production of supplementary nutritional products. As a result, decentralized self-help groups (SHGs) have been promoted and large-scale, centralized

¹ National Family Health Survey (NFHS-3) 2005-06

² Hunger, Under-Nutrition and Food Security in India, N.C. Saxena, p. 28

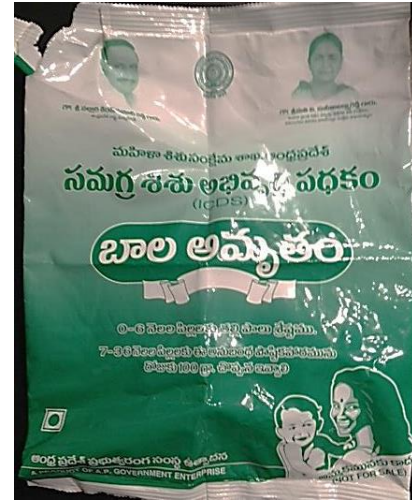
organizations have faced opposition and been viewed with suspicion.

GAIN Invests in Andhra Pradesh Foods

Dr. Sankar, GAIN India’s Country Manager, first approached AP Foods in 2008 about working together to scale up and improve the centralized approach to producing fortified supplementary foods. AP Foods, a government organization mandated to manufacture and supply food supplements for the ICDS program, was established in 1974. With initial backing from UNICEF, CARE, and the Indian Government, it started producing an extruded snack to malnourished preschool and school-going children, pregnant women, and lactating mothers (the beneficiaries). Currently, AP Foods maintains an industrial scale production and storage facility in north-east Hyderabad, producing extruded snacks and fortified supplementary foods fortified nutritional supplement to over 3 million beneficiaries in the Andhra Pradesh region.

GAIN’s objective for this project was to provide AP Foods with financial and technical support to enable an increase in the capacity of its production facility, improve its product formulation and product packaging, and upgrade its quality management systems. GAIN, in partnership with the State government, has invested in the construction of a completely new production facility, which required a total capital investment of \$7.3 million.

The GAIN-AP Foods project is now approximately five years old, and while the new facility is not yet complete, this investment has already had a considerable impact. All of AP Foods’ quality assessment (QA) and quality control (QC) systems have been upgraded; packaging features (size, design and materials) have been improved to ensure longer shelf life; and all trans-fats have been removed from its blended fortified food products. The new, modern production plant is scheduled to be operational by mid-2014.



Key Takeaways

In evaluating the business model of the AP Foods-GAIN model, four key takeaways have emerged.

Takeaway 1: Prioritizing product and operational quality is critical, but organizations must consider the financial implications of decisions, and operate within their established constraints, to achieve long-term sustainability.

Originally, GAIN recommended that AP Foods make a few key product formulation upgrades to their fortified supplementary foods – specifically, to add milk powder and to replace hydrogenated vegetable oil (which contains trans-fats) with soya bean oil. This recommendation was also supported by the National Institute of Nutrition. These new ingredients were more complex than those in the pre-existing formulation, and consequently more expensive and harder to source. AP Foods recognized that soya bean oil was too costly for their existing production budget, but continued to look for a more affordable option that also had similar health benefits. AP Foods leveraged its sophisticated materials procurement platform to eventually identify and source palm oil as a viable substitute that fit within its existing budget constraints.

In the case of milk powder, AP Foods waited to make any formulation changes until the Indian government increased its product purchase price, giving them the financial flexibility to source, process, and incorporate milk powder. AP Foods' response to GAIN's nutritional recommendations demonstrates its ability to make strategic, surplus-driven decisions to ensure sustainability.

Figure 2 – New 2.5kg packets of Fortified supplementary food

GAIN also advised AP Foods to modify the product packaging in order to improve the shelf-life; specifically, to use plastic portion-sized consumer packets instead of 20 kilogram woven sacks. This suggestion was costly, however, so AP Foods again explored less costly, alternative solutions. As a result, AP Foods opted to switch to 10 kilogram high-density polyurethane bags - these were cheaper than consumer portion-sized packets, but still preserved the product shelf-life better than the woven bags did. Eventually, when the product budget was increased and milk powder was added to the formulation, AP Foods made the full switch to 2.5kg plastic consumer packets.

While the aforementioned improvements were compromises from the originally recommended improvements, it is important to highlight two key learnings:

First, AP Foods invested in improving quality control and assurance processes while avoiding driving up long-term input costs. This is significant because it demonstrates the benefits of a large-scale production facility versus smaller, less sophisticated food production models that lack standardized quality control processes. Rigid quality control mechanisms that ensure the right nutrient mix and proper packaging are critical to achieving AP Foods' primary

goal of combating malnutrition. Additionally, when coupled with scale (once the new plant is complete), it allows AP Foods to produce enough volume of high quality products to serve all beneficiaries in the state of Andhra Pradesh.

Second, AP Foods leveraged its scale to adopt a sophisticated vendor selection process. This enables buying large quantities of input materials at favorable costs, enabling it to initially screen potential vendors by quality of reputation, standards, and product. This ensures that AP Foods purchases its materials only from vendors with the proper licenses, certifications, registrations, and safety standards. This pool of vendors represents a group of high quality and reliable suppliers, from which AP Foods is able to select those that offer the most favorable pricing. As a result, AP Foods is able to purchase affordable inputs from vendors without compromising on product quality and safety.

Takeaway II: Targeting investments that drive long-term value without neglecting short-term opportunities is key to success.

In Andhra Pradesh, GAIN, AP Foods, and the government have invested in a new facility, rather than upgrade the existing plant. This decision will enable them to maximize the long-term impact of their investment. Although an upgrade of the existing plant might have been quicker, building a new plant will ultimately generate more comprehensive operational improvements. The new facility will include safer, highly-automated production, and will enable greater scale that will allow AP Foods to reach the entire Andhra Pradesh region. Furthermore, GAIN's decision to invest acted as a catalyst for the new plant project by motivating the Andhra Pradesh government to also make an investment (three times the amount of GAIN's).

The new fully-automated facility is planned to be operational by June 2014 and will require less labor and include a more efficient layout than the existing production facility. The new facility will help AP Foods achieve efficiency similarly found in private enterprises and will drive an estimated 50% increase in production capacity of fortified supplementary

foods (MTFs). Additionally, a new testing facility is also being constructed and will enable improvements in quality control and increase the sophistication of the micro-nutrient product formulation. The decision to invest in a new facility shows a strong commitment to AP Foods' and GAIN's long-term goal of efficiently producing a high-quality fortified food product at scale. This is seemingly different from traditional social or government organization approaches that struggle to balance social impact with efficiency and quality.

However, it is also important to note that, given the long time frame required to build a new facility, finding short-term opportunities to reduce costs and improve production efficiency is essential. Under strong leadership, AP Foods had already made significant operational improvements to the productivity of their existing facility prior to partnership with GAIN and ongoing improvements have since continued. With GAIN support, AP Foods has been able to drive short-term improvements in product formulation, packaging, and food quality certification (AP Foods gained ISO 22000:2005). Additional opportunities to improve plant efficiency still exist, for example, if AP Foods were to hire a lean operations specialist to identify and execute significant though relatively inexpensive process improvements at the existing AP Foods facilities, production capacity could be significantly expanded long before the new plant becomes fully operational.

GAIN's involvement was vital in providing credibility to the plan to build a new plant, and its investment of 10 crores (\$1.8 million) unlocked additional local government investment of 30 crores (\$5.4 million). Once operational, this model can be utilized by GAIN and AP Foods to demonstrate the benefits of centralized production to other State governments as a cost-effective and efficient strategy to produce high-quality supplementary foods at scale. Unlocking government funding is critical to launching large scale nutritional programs, and in this project GAIN was highly successful in doing so by bringing both expertise and capital to their partnership.

Takeaway III: Integrating production with the demand end of the supply chain can enhance

the impact and sustainability of a nutrition intervention.

In countries with large outreach programs (such as ICDS) it is critical to leverage the existing systems in order to efficiently reach beneficiaries. In India, ICDS's AWCs provide a broad, established distribution network for take-home rations (THRs) of supplementary food products. Given the governmental support for and broad reach of ICDS, GAIN has focused its intervention in Andhra Pradesh on improving the early areas of the supply chain. They determined that enhancing product quality and production processes in partnership with AP Foods would enable the greatest impact with the available resources.

As a result of concentrating investments in the areas

“Education plays a very, very important role. People have to learn by doing. There are many challenges with ensuring proper usage. We haven't seen any major impact on infant and children nutrition.” – Ram Shastry, Senior Program Manager, Clinton Health Access Initiative

of product formulation and production while relying on the government and ICDS to distribute the products and provide education, the impact of the project on improving beneficiaries' nutrition is potentially limited. It is important to note that the Andhra Pradesh business model is unique in that the government guarantees the market, and demand generation is consequently not part of AP Foods' mandate. However, in other GAIN investments there may be opportunities to optimize the impact of the intervention (especially the effect of improved product quality). In Andhra Pradesh, this would have required greater collaboration with ICDS, which was out of the project scope and would've been incredibly complex. So while, it wasn't suitable in Andhra Pradesh, integrating the “last mile” into the overall business strategy can help ensure the value of the investments made by GAIN.

While there have been significant product improvements, it's possible that the benefits may not be fully realized because of unexpected acceptability issues and improper usage. According to several industry experts, education plays a critical role in impacting the nutrition of beneficiaries and it has proven to be a significant challenge.

Additionally, a 2012 study³ conducted by the Indian government (supported by GAIN, the NIN, and AP Foods) that compared the impact of the AP Foods model to that of the local foods model shows that awareness of health benefits is critical to generating favorable attitudes towards supplementary nutritional products. This all indicates that engaging further across the supply chain by enhancing the education of both the Angangwadi Workers (AWWs) and beneficiaries can ensure that nutritional benefits are better understood, the product is being used correctly, and that beneficiary health can be positively impacted.

One area where AP Foods has been highly successful in creating value by integrating more closely with the demand end of the supply chain is with its mFoods project. mFoods is a mobile technology and web-based supply chain management tool. This technology works by having AWWs enter product requests through mobile phones, and then a centralized system tracks those requests along with their date and time, and alerts are sent to relevant stakeholders. In response to the requests, AP Foods can dynamically adjust its supply schedules to better meet demand. With this system, inefficiencies in the order and supply process can be tracked by the stakeholders throughout the supply chain, resulting in more timely production, less waste, proper accounting, and increased overall efficiency.

Engaging further with the AWWs and beneficiaries can also allow AP Foods to learn from their “consumers.” While AP Foods occasionally interacts with the AWWs, there is more opportunity to develop these relationships and reap the benefits of two-way knowledge sharing. Gaining a better understanding of beneficiaries and their behavior can

inform product decisions and directly address their needs and preferences, resulting in greater acceptability.

Takeaway IV: Measuring the nutritional impact enables a greater understanding of investment effectiveness and allows GAIN to more easily demonstrate success.

Baseline and endline data on acceptability, compliance, and coverage would contribute to a better understanding of the impact of the investments in improving product composition, quality and shelf-life and therefore to better measure the investment's success.

Additionally, empirical data could help advocate for the beneficial impact of models like the AP Foods-GAIN partnership.

When GAIN first began its engagement in the state of Andhra Pradesh back in 2008, the contract proposal originally drawn up for the AP Foods investment included stated goals related to improving the consumption rates, acceptability, and nutritional impact of AP Foods' products. Unfortunately the project scope and budget did not allow for substantial resources to be dedicated to impact assessments.

According to Sadhana Bhagwat, Senior Associate with GAIN India, this decision was made for two primary reasons. First, AP Foods considered the measurement of beneficiary uptake, acceptance, and nutritional status outside the scope of its mission. Second, nutritional experts have found that measuring the impact of nutritional programs is an extremely challenging task, and requires significant financial

AWC Reporting Challenges

- AWWs are required to send in monthly report
- Accuracy of beneficiary attendance data is a concern
- Monthly progress reports show the centers are reaching over 80% of their intended populations
- Third party studies show far lower numbers
- ICDS is trying to combat this issue through innovative biometric solutions
- Still appears to be a need for third party involvement and audits

³ Study: “Evaluation of the acceptability and the nutrient adequacy of meals supplied by A.P. Foods to the ICDS centers for pre-school

children (3-6 years) and the impact on nutritional status and comparison with the local food model”

investment if done correctly. Even when comprehensive studies occur, the results of the studies may not be insightful because there are many different factors that can contribute to nutrient deficiencies and stunting outside of supplementary nutrition interventions (illness, infections, lack of sanitation, feeding practices, seasonality, etc.). A critical challenge is obtaining accurate data from AWW reports (the ICDS currently requires each AWW to send in monthly reports). Due to limited funding, this was excluded from the project scope and baseline and endline assessments of the impact to beneficiaries from the formulation and packaging changes were not implemented.

In 2012, a study was conducted by the State Government of AP that compared the impact of the AP Foods model to that of the local foods model⁴. Acharya NG Ranga Agricultural University, Hyderabad was commissioned the study (unpublished data).

For context, the local food model was a model developed by ICDS in recent years; in this model, raw ingredients were supplied by the ICDS project directors through district purchasing committees to the AWCs, and then cooked and served to beneficiaries by the local helper. This study was designed specifically to collect empirical comparative feedback on the health and nutritional status of beneficiaries receiving food supplied via the AP Foods model (APFM) versus the local food model (LFM). To assess these impacts, the study used anthropometric measurements (height, weight, arm circumference, etc.), verbal accounts, and recollections of dietary habits, and observation.

The results of this study clearly showed that the APFM had a statistically significant positive impact on the nutritional status of the preschool children as evidenced by better acceptability, significantly higher anthropometric indices (as measured by height, weight and mid upper arm circumference), better food and nutrient intake and adequacies, and lower incidence of nutritional deficiency symptoms and

morbidities when compared with LFM. It was observed that the supplementary foods supplied by both food models were equally accepted by all the beneficiaries, except for one product that was poorly received. These findings provide significant empirical support for any recommendations related to expanding the AP Foods Program and continuing to improve the acceptability of certain AP Foods products.

Looking Ahead

What's Next

AP Foods, with its soon-to-be completed facility, seeks to become recognized as a leader in centralized food production in India. If successful, it will begin hosting other states' leaders to observe and learn about the model in hope that they will adopt and implement it in their respective states. Additionally, AP Foods could potentially leverage its size and production capability to supply other Indian states with nutritional products.

In order to fill the data gap, GAIN has engaged the Agricultural University of Hyderabad to conduct a study that will look at the consumption of AP Foods products by beneficiaries receiving take home rations and also demonstrate differences, if any, in the acceptability of the new formulation (with milk powder that is introduced in few centres) versus the existing formulation (MTF). The study will also assess beneficiaries' dietary gap, estimate the nutritional gap that AP Foods products can fill, and simulate the impact of the products. Additionally, GAIN will work to evaluate the success of its involvement with AP Foods to develop alternative strategies that appease proponents of both centralized and decentralized food production, with the hopes of providing financial and operational support to other states throughout India that face nutritional challenges.

⁴ Study: "Evaluation of the acceptability and the nutrient adequacy of meals supplied by A.P. Foods to the ICDS centers for pre-school

children (3-6 years) and the impact on nutritional status and comparison with the local food model"

Figure 3 - Construction on the new AP Foods production facility



Summary and Key Takeaways

GAIN's project in Andhra Pradesh is now nearing completion, and has demonstrated the value of applying a business mindset to development projects. GAIN has been able to drive improvements in quality and nutritional value, without losing sight of cost implications. In addition, GAIN, in partnership with the regional government, made a sizeable capital investment in a new production facility that focused on maximizing the efficiency, cost, and quality of production, rather than generate additional employment or social impact, as is often the goal with development projects. The business rationale applied to this capital investment will ultimately secure an efficient, cost-effective supply of supplementary nutrition for Andhra Pradesh for many years to come.

Prioritizing product and operational quality is critical, but organizations must consider the financial implications of decisions, and operate within their established constraints, to achieve long-term sustainability.

GAIN was able to drive improvements in AP Food's product, by eliminating trans-fat and increasing the nutritional components, without losing sight of a sustainable cost structure. GAIN was able to find compromises, such as using palm oil rather than soy bean oil, to achieve nutritional improvements while acknowledging cost constraints. In addition, improvements, such as those reducing the size and enhancing the quality of the packaging, were made

gradually and with close consultation with government counterparties, to ensure that any improvements would still result in sustainable operations.

Targeting investments that drive long-term value without neglecting short-term opportunities is key.

GAIN's investment decision in Andhra Pradesh was approached with a business mindset, rather than the common practice of focusing solely on social impact, that prioritized creating the highest impact on efficiency, scale, and quality while remaining cost effective. The new facility, currently schedule for completion in June 2014, will have an estimated payback period of three years, and with a scale that would have required approximately four times the investment if met by the SHG model⁵. Ultimately, the investment will take longer than expected to bear fruit, and there will have been potential short-term operational improvements that were missed along the way, such as considering lean modifications, but the overall approach will have been successful.

Integrating production with the demand end of the supply chain can enhance the impact and sustainability of a nutrition intervention

GAIN India is in a unique position where the regional government guarantees demand and provides distribution to beneficiaries through the ICDS network. Consequently, GAIN focused on the product and production end of the value chain rather than distribution and consumer advocacy. As a result, while there have been significant product and production improvements, the overall impact is possibly negated by acceptability issues and improper usage. GAIN and AP Foods could have further engaged across the supply chain by enhancing the education of the AWWs and beneficiaries, as well as finding opportunities to gain direct feedback from consumers to learn how to improve the product and packaging.

Measuring the nutritional impact enables a greater understanding of investment

⁵ GAIN data and Tuck School of Business analysis

effectiveness and allows GAIN to more easily demonstrate success.

Without data such as baseline and endline statistics, it is difficult to fully understand the ultimate nutritional impact of GAIN's involvement in Andhra Pradesh. Empirical data would help support ongoing improvements in quality, and most importantly, would better enable GAIN and AP Foods to advocate for beneficial impact models such as this partnership.

GAIN and AP Foods intended to measure the improvement in consumption rates, acceptability, and nutritional impact of AP Foods' products. Originally, a comprehensive baseline assessment was not undertaken: firstly, because GAIN considered the measurement of beneficiary uptake, acceptance, and nutritional status outside the scope of the investments and secondly, measuring the impact of nutritional programs is an extremely challenging task that requires time and substantial financial investment, which was not available for the project. This is a common challenge across development projects.

However, GAIN is currently planning to conduct a consumption and acceptability coverage study, which will be a positive step in addressing the current data gap.

Contributing Organizations



This article was written in collaboration with the Global Alliance for Improved Nutrition (GAIN), the Global Business School Network (GBSN), and the Tuck Global Consultancy Program at the Tuck School of Business at Dartmouth. Information is as of January 15, 2014. For more information on GAIN, please contact Magali Leyvraz at mleyvraz@gainhealth.org; GBSN, please contact Lisa Leander at lleander@gbsnonline.org; and the Tuck Global Consultancy Program or the Tuck School at Dartmouth, please contact Kerry Laufer at Kerry.L.Laufer@tuck.dartmouth.edu.