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Revitalizing and Modernizing Smallholder Agriculture for Food Security, Rural Development and Demobilization in a Post-War Country: The Case of the Aldeia Nova Project in Angola

by

Ayal Kimhi

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P.O. Box 12, Rehovot 76100

ת.ד. 12, רחובות 76100

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Ayal Kimhi*

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Abstract

The Aldeia Nova project is aimed at demobilizing ex-combatants to rural areas and settling them in modern agricultural communities. It has been three years since the first settlers arrived in the Waku-Kungu valley and now 600 families are using modern agricultural technology to produce milk, eggs and vegetables which are marketed in the urban centers of Angola. These families earn an enhanced living and in addition, the project has provided employment to hundreds of other Angolans. More specifically, the entire region has been revitalized with thousands of families pouring in to enjoy the benefits of the newly revitalized local economy. This paper presents the concept of the Aldeia Nova project, describes its evolution and discusses its strengths and weaknesses. It concludes that the benefits of the project go far beyond its measureable economic impact and that Aldeia Nova's original and ambitious goals are not beyond the reach of the Angolan people.

Key words: Smallholder agriculture; Rural development; Food security; Technology adoption; Cooperation; Demobilization; Reconciliation; Angola.

Introduction

The Aldeia Nova project is an ambitious joint initiative of the Government of Angola and the LR Group from Israel, to initiate and advance a rapid process of rural settlement and agricultural development in the Waku-Kungu valley which is located in Cela county, Kuanza-Sul province (figure 1). The project encompasses several parallel efforts, including restoration and further development of family farms, resettlement of ex-soldiers and their families, investments in physical and human infrastructure, construction of input supply and output processing centers, and together targets job creation and economic prosperity for the wider population of the region.

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* Ayal Kimhi is Associate Professor of Agricultural Economics and Management at the Hebrew University. He has been the guest of the LR Group in Waku-Kungu, and wishes to thank the many people who contributed from their knowledge, experience and data. Contact: kimhi@agri.huji.ac.il.

The concept of the Aldeia Nova project is based on the Israeli experience of settling masses of refugees in rural areas back in the early 1950s. The Moshav (Zusman, 1988; Kislev, 1992), a cooperative village with joint marketing and purchasing that works closely with a regional center of output processing, input supplying and service providing enterprises, was chosen as a model, and was modified with the necessary adjustments to meet the specific conditions of Angola and the region. A particular modification was made in the implementation of Aldeia Nova because cooperation in the original Moshav did not prove itself sustainable in the long run (Schwartz, 1999). Hence all the joint activities in Aldeia Nova are managed by a government agency rather than by the farmers themselves.

The three main goals of the project were: (a) demobilizing population from Luanda back into the countryside; (b) reconciliation between ex-soldiers from different factions; and (c) agricultural development for increasing local food production. The motivations for these goals were multi faceted. During more than 40 years of civil war, millions of Angolans left their homes in the countryside and fled to the capital city of Luanda and other semi-urban areas in the vicinity of towns such as Huambo, Sumbe, Gabela and Wako Kungo itself, to benefit from the relative safety of the urban environment. The result is that today, Luanda and other towns are surrounded by slums inhabited by jobless families suffering from extreme poverty. The project therefore aimed at finding solutions and motivation for such families to return to the countryside. In addition, thousands of discharged soldiers, both from the government side and from the UNITA organization, also filled Luanda neighborhoods (Marques, 2003). These ex-combatants enjoyed a government pension and hence had little incentive to find jobs. The project therefore aimed at providing employment for ex-combatants in a setting that they would consider as a reward for their military service, thus helping them to re-establish civilian livelihoods.[1] An additional benefit would be the symbol of reconciliation by resettling discharged government soldiers and former UNITA fighters in the same village.[2] Finally, Angola's agricultural production was too low given the country's natural resources and potential. Angola still imports about 50% of its food. The thinking was that agricultural development would lead parallel growth in the rural non-farm sector and thereby stimulate the local economy and contribute to the fight against poverty (Mwabu and Thorbecke, 2004). Therefore, agricultural development was perceived as the natural path to take in order to increase local food production, decrease the need for food imports, and thereby accomplish all three goals.

The Waku-Kungu Valley was selected for the project because of its proven agricultural potential and accessibility. The town of Waku-Kungo is served by an important network of roads connecting it with the biggest commercial centers, specifically Huambo (180 km), Luanda (420 km), Gabela (150 km), Sumbe (240 km) and Porto Amboim (280 km). Starting in the 1940s, the valley was selected by the colonial government for the settlement of Portuguese families. Between 1940 and the 1960s, 15 agricultural villages surrounding the town of Waku-Kungu were settled. Each village included approximately 30 farm households. The settlers invested in infrastructure, including drainage systems, roads and irrigation canals. During that time, the valley provided fresh milk and other farm products which were distributed

[1] Parallel reintegration efforts, on a larger scale, were financed by the World Bank and other donors. See http://www.mdrp.org/angola_main.htm for details. Compared to the Aldeia Nova project, those efforts lacked the agricultural development component.

[2] This is somewhat contrary to recommendations based on the experience of other countries. See for example Colletta, Kostner and Wiederhofer (1996).

throughout the country. After the dismantling of the Portuguese Colonial Authority in 1975, the Portuguese settlers left and Angolan natives took their place. However, without proper maintenance and through decades of devastating civil war, the agricultural capacity of the valley completely vanished. The drainage system and the irrigation canals became clogged and the farm buildings and houses deteriorated. In the early years of the 21st century, local residents were surviving on a near-subsistence level, relying on small-scale cultivation of maize for self-consumption as well as pineapples and avocado as cash crops.

As of 2003, when planning of the Aldeia Nova project begun, the 15 ex-Portuguese villages were home to about 400 Angolan families. Eight villages, which accomodated about 200 families, were selected to be rebuilt during phase I of the project. The population of the villages was expanded to 600 families, each entitled to a total of 30 ha of agricultural land. A 3 ha parcel of land was attached to each house for cultivation of fruits, vegetables and field crops, and for cow grazing. The remaining 27 ha were intended for centralized cultivation of grains to be used for livestock feed. 500 families were provided with livestock facilities. These included:

- 160 dairy farms
- 120 egg farms
- 120 poultry-fattening farms
- 20 pullet farms
- 80 pig farms.

The remaining 100 families were to be employed in the service facilities. Table 1 shows the distribution of types of farms by villages.

In addition to the family farms and housing, the Aldeia Nova project also incorporated investments in public facilities within each village. This included central milking parlors and an egg collection station, in villages with dairy farms and egg farms, respectively. Additionally, community service facilities such as churches, schools and medical clinics, and infrastructure facilities such as roads, electricity and water sanitation facilities, were built. Another important element of the Aldeia Nova project was the construction of a Logistics Center, without which modern market-oriented agricultural production would not have been feasible. The Logistics Center encompasses "input" facilities including a nursery for trees and vegetables (also serving as an experiment station), an egg hatchery, a livestock feed facility and an agricultural machinery facility. In addition, the Logistics Center also includes output processing facilities such as a milk products production plant, a butchery for cows, pigs and chickens and storage facilities for eggs and vegetables. In addition to the land, housing and public facilities, an additional and important component of the project is the training of personnel, including agricultural extension experts and social coordinators.

In the next section the geography of the Waku-Kungu area is discussed in more detail. Following that, the step-by-step development of the Aldeia Nova project is presented. The next two sections discuss the strengths and weaknesses of the project and the final section concludes with some insights about the potential of replicating the Aldeia Nova project in other regions/countries.

Regional geography

Altitudes in Cela county range from 1200 meters in the lowland valleys to 1300-1400 meters in the intermediate plateaus and reach 2100 meters in some isolated high points. The lowlands, especially along the banks of the rivers and sometimes extending materially inland, are frequently flooded. Starting from these low-lying

areas of more or less gentle hillside, one enters plateaus of different dimensions, with granite outcrops and isolated mountains. The area is dominated by ferralitic soils, associated with para-ferralitic soils which show up in hilly places, especially the foothills. These are soils derived from pre-Cambrian granite, granodiorites and quartz diorites. In the frequent lowlands where the rivers start to meander there is a tendency for the formation of organic soils.

The area of Cela has an abundant hydrographic network, with The River Nhia in the north and The River Queve in the south. There is also The River Kussoi, which played an important role in the settlement of the region, which is connected to the first settlements (Colonato da Cela). A large number of streams, with appreciable flow during the eight months of the rainy season, complete the availability of water in the region.

The climate of the region is considered to be humid temperate with a dry winter. This allows for growing a wide variety of vegetables and the acclimatization of cattle from temperate and even cold climates. The rainy season starts in the middle of September and continues till the middle of May, with a short middle period of dryness (the small *cacimbo*). It hardly rains during the months of June, July and August. Average annual rainfall is about 1,350 mm, with a variation coefficient of 18% (in a very regular regime). Average annual temperature is 19.6º Celsius with a maximum of 35º and a minimum of 1º. The average temperature during the hottest month is 22º and the coldest being 17º. Daily temperature differences are large, especially during the *cacimbo* (dry period), reaching up to 27 degrees during the day, and down to near freezing at night. Relative humidity is about 40-50% during the *cacimbo* and 80-90% during the rainy season.

The Aldeia Nova project: step by step

The planning of the project started in early 2003. Various Israeli experts visited the Waku-Kungu Valley in order to determine the agricultural potential as well as the constraints and challenges. In addition, a team of social scientists studied the population of the ex-combatants in order to understand their suitability to the project and adjust the plans accordingly. The Angolan government approved the plans in December 2003 and allocated an initial $70 million for the implementation. Beginning in January 2004, potential candidates for the project were interviewed by agents of the Instituto de Reintegração Sócio-Profissional dos Ex-Militares (IRSEM), supported by Israeli staff. The minimum requirement for inclusion was literacy. In addition, the interviewers tried to assess the suitability of the candidates for life in the new community, their willingness for political integration, and their chances to live a stable family life. In addition, interviewers tried to identify potential alcohol-related problems. Those who seemed to be most qualified and ambitious were selected as candidates to serve as Social Coordinators. Sixty potential Social Coordinators went through a short training course during May 2004 and 27 of them were finally selected. In June 2004 the Social Coordinators started more intensive training, which included studies in Angola as well as in Israel. 23 Social Coordinators completed the full training process.

In May 2005, the first group of implementation experts arrived at Waku-Kungu in order to start the construction of the project. They included surveyors, infrastructure constructors and field-crop experts. Their first task was to plan and prepare infrastructure for villages and agricultural plots. This included roads and drainage canals. The plan of the Valley can be seen in figure 2. Renovation of the old

Portuguese houses in Village 2 began in the middle of 2005.[3] During the renovation, the families that occupied those houses were temporarily moved to old farm buildings in their back yards.[4] After they moved back into the renovated houses, the old farm buildings were demolished. By the end of 2005 some new houses were built for the new residents, and these new community members moved in gradually.[5] Farm buildings as well as water, sewer and electricity infrastructure were constructed during this time. Figure 3 shows a satellite photo of village 1, where the orange-roofed houses next to the road, the bright roofs of the cow sheds behind the houses and the individual plots behind the cow sheds can be seen.

The Social Coordinators also moved into the new houses in the villages and started working with the residents. They served as both agricultural extension agents and as social facilitators - teaching the residents how to use modern farming techniques on one hand and how to live in a modern house on the other hand. The first 80 dairy cows were brought in from South Africa in November 2005, and the first flock of 11,000 chicks subsequently arrived. The infrastructure of the Logistics Center, as well as the hatchery, was completed by December 2005. It was at this time when the project was officially inaugurated in a ceremony that was presided over by the President of Angola. Construction continued gradually thereafter. By mid-2007 the Logistics Center was completed and on February 18th, 2008, the project was officially handed over to the Angolan government. Some Israeli and Brazilian experts are still employed as consultants, but today, the management of the project is in the hands of the Angolans.

Agricultural production has steadily increased since the beginning of the project, through three channels:

- new farms being built
- intensification of production on existing farms
- improvements in farm productivity

The increase in the aggregate level of production from 2007 to 2008 can be seen in table 2. Today, the Aldeia Nova project as a whole produces 36,000 liters of milk and 300,000 eggs per week and is the only source of fresh milk in Angola. Dairy products produced at the Logistics Center, using the milk produced in Villages 1, 3 and 6, are distributed to Waku-Kungu school children free of charge on a daily basis. Eggs are perhaps the most successful output of the project. The demand for eggs far exceeds supply, and therefore egg production is expected to double after phase II farms begin their production. Maize yields in the centrally-cultivated plots are 2,500-3,000 ton/hectare,[6] versus 600 ton/hectare before the project started. At this stage of the project, the egg farms are operating close to full capacity, while other types of farms are working to reach that point.

[3] It should be noted that the Portuguese named their villages by numbers, from village 1 to village 15, by the order in which they were built, which is more or less from south to north. Despite the fact that the villages also had names, the local residents were still using numbers as names when the renovation begun, so it was most convenient for everybody to keep the village names as numbers. Renovation started from village 2 and continued more or less in the same order. Village 1 was an exception in that it had been used previously as a military camp and had no residents.

[4] During the years, some families settled in mud huts on land that was intended to be included in the project. These families had to move to alternative locations. They were given cash compensation as well as building materials to construct their new houses, and moved out voluntarily.

[5] The composition of the ex-combatants was 75% from the government side and 25% from UNITA side.

[6] With the exception of the 2007/8 crop years which suffered from a severe drought.

Strengths of the Aldeia Nova project

This section discusses the strengths of the Aldeia Nova project vis-à-vis the previously described goals.

Agricultural production

The most successful farms, as mentioned above, are the dairy and egg farms. This is due both to high productivity and market demand. Daily milk production stands at around 15 liters/cow, versus 5 liters/cow a year ago. This is close to the target set in the plan. The mean net income of dairy farms in Village 1 was $510 in January 2009, compared to the official minimum wage of $110. It should be noted that 7 out of 80 families made over $1,000 in that month. The dairy parlors are computerized and information about the herd is gathered and evaluated continuously. It is impressive to see local workers, who hadn't seen a cow or used electricity until two years ago, operate advanced milk parlors in a professional manner. Fresh milk and dairy products are marketed outside of the valley, and demand is expected to increase over time with the overall growth in the internal Angolan market and with the increased awareness of the availability of these fresh dairy products.

Egg production has also been impressive, with chickens yielding about 5 eggs per week. Total egg production is already exceeding the plan even before phase II of the project has come on-line. Perhaps the most convincing evidence for the strong market for eggs in Angola in general and in Waku-Kungu in particular is the tendency of the farmers to sell part of their production on the black market. Walking through the main road near the Waku-Kungu market, people walking around with cartons of eggs in their hands is a regular site. The mean net income of egg farms in Village 4 stood at $1,097 in January 2009, not including the black market sales. It seems apparent that any expansion in egg production will be readily absorbed by the market. To meet that demand, a 100% expansion is planned for phase II of the project.

Vegetables are a secondary source of income for the livestock farms and for the Social Coordinators and other village residents. Families choose which vegetables to grow and cultivate their plots on their own. Each family (except for dairy farmers who utilize the land for grazing) cultivates between 0.05 and 0.1 hectares of vegetables. Only about half of the output is marketed through the project. Most of the 3-ha plot behind each farmhouse is cultivated with maize and is used predominantly for self-consumption. Hence, it is difficult to estimate productivity on these plots. Nonetheless, it is evident that the cultivation practices are improving over time. This is evidenced by the fact that many farmers are using hired labor on a regular basis, and almost all of them are using hired labor during harvest times, thereby adding to the employment opportunities in the region. Some farmers even grow vegetables on a larger scale and use mechanized cultivation, which is a service that is provided by the Logistics Center on a demand basis.

Social issues

The ex-combatants have largely adapted to their new surroundings, environment and life style. Only 5 families out of the initial 600 were found to be unsuitable and had to leave. Additionally, there is no observed tension or conflict between the original residents and the new settlers, or perhaps even more impressive between former government soldiers and former UNITA fighters. As was anticipated

in the original planning, economic prosperity seems to be a moderating factor for any potential trouble.[7]

Schools and education have been another material aspect of the success story of the Aldeia Nova villages. School buildings were built under the project mandate and are operated by the government. Hence they are open to students from the entire region. The advantage for the villages' population is their proximity. The schools operate around the clock in three shifts. Children from kindergarten through fourth grade study in the morning shift. Older children study in the afternoon and adults attend class in the evening. The demand for education by the adult population has been surprisingly high. Many adults who could not attend school regularly as a result of being displaced during the civil war, are now availing themselves of the learning opportunities provided by the project and are going back to school to complete their formal education. This is due in part to the recognition that formal schooling may advance their ability to seek a more advanced and productive employment within the project or elsewhere. This aspect of the project's success supports the well known fact that education is one of the most important elements of poverty reduction policies (de Sousa et al., 2001).

Additionally, the project has assured the stability of family income and social protection which is another key ingredient for a successful and sustainable anti-poverty policy (Christiaensen, Demery and Paternostro, 2002). The safety net provided by the project of a minimum income in the case of failure absorbs the input and output price fluctuations through this implicit subsidization. The result is enhanced confidence of the farmers and their families in the sustainability of their farms and their increased trust in the success of the project.

Regional prosperity

The project arguably materially stimulated the local economy of Waku-Kungu and now provides the livelihood for thousands of people. The net agricultural income alone of the 600 project families totaled $207,000 in January 2009.[8] The 320 employees of the Logistics Center had an average monthly wage of $300 which contributed $96,000 to the regional income during that period. Therefore, extrapolating these data suggests that the direct impact of the project on regional economic activity will exceed $3.5 million annually. This direct income figure does not take into account the lion's share of the millions of additional dollars spent on livestock feed and other production inputs, at least part of which are spent within the region. Indirectly, this income generates demand for goods and services that has a multiplier effect on the economy of the region. Additionally, as a result of the profitability of farming, project families now hire local residents to work in their fields. Further, due to the availability of electricity in the villages, families are buying refrigerators and thereby diversify their diets. The Social Coordinators provide guidance about modern home cooking and about the nutritional values of food as well as the importance of cleanliness, hygiene and sanitation. Another interesting benefit of refrigeration is that it allows families to make ice cream (using Baobab fruit cooked with sugar) which they sell in the market, generating an additional source of income.

[7] Some tension does exist between people who have come from outside the region (and in particular Umbundu speaking people) and residents of the region who speak N'goya.

[8] This is remarkably close to the monthly income figures in the plan, $342 per family, totaling $205,200. However, the project still does not charge families fully for loan repayments, so the comparable net incomes are somewhat lower than the plan. One should remember, though, that not all farms already reached full capacity.

This is an example of an entrepreneurial activity which is an indication of a healthy growth process (Naude, 2008). The population of Waku-Kungu and the surrounding villages has grown dramatically since the launch of the Aldeia Nova project. More importantly than the sheer growth in population of this rural area is that it is one of the only regions in Angola without massive unemployment. The derivative effects of the growth, employment and vibrant economy are many and varied. For example, one of the local bank officials said that before the project started there was virtually no business for the bank because the residents had no purchasing power. These days thousands of employees get their monthly salaries through the bank and use automated cash machines to withdraw from their accounts. In addition, now the bank provides small-scale loans to families with regular salaries for a wide range of purposes.

Another element of evidence of success is that the price of housing and farmland has increased dramatically since the beginning of the project. Prior to the project, a house in Waku-Kungu could be rented almost for free. Today, the rental rates reflect expectations for growth. Housing construction can be seen throughout town. A new neighborhood of 200 homes is being built for project employees, and 205 houses in the villages are being renovated as part of phase II of the project. Again, the impact of more housing construction causes the generation of more jobs and these construction workers obtain benefit by increasing their professional expertise and subsequently can become self-employed. The number of motor vehicles in the region has also increased dramatically. In 2002 it was estimated that there were a total of 60 motor vehicles in the entire Cela County. Today the town of Waku-Kungu is experiencing heavy traffic from cars, trucks, and especially motorcycles. In fact, the local Police Chief claims that motor cycle accidents are the number one cause of unnatural deaths in the area and he attributes such accidents in part to the increase in congestion. Another sign of prosperity is that the price of gasoline on the black market is 75% over the official price. An additional measurable aspect of progress is the proliferation of cellular phones. Three years ago a satellite phone was needed in order to make a phone call in Waku-Kungu. Today, almost everyone has a cellular phone.

Tourism is also developing in Waku-Kungu. People from Luanda and other towns come on weekends to see the agricultural miracle coming into being and to buy fresh agricultural products. Hotels and restaurants are being opened and renovated. Private farms throughout the area are being bought by businessmen who are adopting the modern agricultural technology and realizing the profit potential of a fast-growing region, and. Some of them are competing with the project farms, while others specialize in selling inputs to the project, such as fertilized eggs. The price of these properties has increased ten times in recent years. Altogether, the allocation of public funds to initiate development in a rural area such as Waku-Kungu is justified as a balance for the rapid oil and mineral based growth in urban Angola and is an important (and in the case of Aldeia Nova, a proven) anti-poverty policy (Bigsten and Fosu, 2004).

Weaknesses and future challenges of the Aldeia Nova project

The Aldeia Nova project is not free of weaknesses. Some are due to unknown factors that led to certain assumptions made during the planning, while others are due to changes that occurred between planning and implementation. Some of these issues can be overcome, at least in part, by adjusting the plans during the implementation, while other issues prove more challenging. The discussion below begins with the

difficulties that affected the time table of the project and then moves to issues related to agricultural production, and social issues.

Construction time table

The early stages of the project faced many difficulties, especially with respect to transportation. Every piece of machinery, equipment and material had to be brought in Luanda or was imported and then needed to be transported by land to Waku-Kungu. The trip from Luanda took about 14 hours by truck because roads and bridges were in a state of disrepair and in many places barely passable. As a result, many trucks did not make it safely to their destination. Naturally, this challenge caused the first phases of construction to take longer than initially planned.

Agricultural production

Perhaps the most significant challenge facing the Aldeia Nova project was the inability to produce the planned amounts of grains to feed the livestock. The Logistics Center could not reach the goal of cultivating 13,800 hectares of field crops for grains for several reasons. First, it turned out that only 6,000 hectares of land were available and suitable for cultivation in the valley. In addition, technical issues lead to difficulties with preparing and cultivating the land. The last reason was inadequate and irregular rainfall, especially during the 2007/8 crop season. The project was able to cultivate about 1,700 ha of field crops in 2007 and plans to cultivate about 1,900 ha in 2009 (table 3). Despite the fact that yields were respectable (except for 2008) only about 10% of the grains needed for feeding the livestock were produced. The Logistics Center therefore had to purchase additional grains from other sources. This need occurred during the global food price crisis and hit the project hard financially. Specifically, although an average grain price of $150/ton was assumed in the plan, the market prices at the time of need were around $700/ton and even reached $1,000/ton in some instances. Since the Logistics Center could not charge the farmers for these incremental costs, it had to absorb the significant price differentials. For the future, the project is considering investing in a field crop irrigation system. The initial investment for such a system is estimated to cost as much as $20 million, but could save money in the need to buy outside feed at high prices in the future and enable the region to increase its self sufficiency.

Difficulties were also experienced in the pig farms. Bringing the pig farms to the situation in which they can operate reasonably took much longer than expected. The first pigs were expected to be slaughtered in April 2009. The poultry farms have been operating as planned, but there were difficulties with marketing frozen chickens. Evidently, Luanda's markets are flooded with imported frozen chickens. Although these are likely of very low quality, they are sold for low prices and therefore the project's fresh and higher quality product has experienced difficulty competing. Therefore, currently chickens are sold only at the local market. Buyers in the region prefer fresh rather than frozen chickens, and this requires some adjustments in the feeding practices and the growing cycle. Nonetheless, currently the proceeds are lower than expected.

Finally, the low-pressure drip irrigation system adopted for the vegetable plots turned out to have technical issues which made it unreliable. Today, project administration is experimenting with an alternative drip irrigation technology to address this issue.

Social issues

Perhaps the biggest social problem within the Aldeia Nova villages is alcoholism. Whether this is a habit of ex-combatants or a side effect of the availability of cash income, heavy drinking by men is a serious problem that leads to the ineffectiveness of these men as breadwinners and also often is the cause os domestic violence. The Social Coordinators are doing their best to fight this problem, but have had limited success thus far. Even without alcoholism, some of the ex-combatants feel that having to work for a living after having sacrificed so much for their country and after being promised a government pension, is a dishonor. In many households, most of the farm tasks are therefore performed by women and children, and for those with drinking issues much of household income is spent on alcohol.[9] The over-employment of women on the farm and in the household limits their possibility to engage in the labor market or in self-employment activities which are known to be favorable for rural development (Gladwin et al., 2001).[10] Another adverse consequence is that farm work competes with children's schooling. School attendance is still close to 100%, but farm and household labor might harm the effectiveness of schooling (Edmonds, 2007).

Another issue that is socially troublesome in Aldeia Nova villages is the predominance of polygamy in Angola. The definition of what is an economically effective family unit for the Aldeia Nova project was explored at the interview stage. Hundreds of the interviewees were asked who they think should enter the house with them. Over 95% said that the first wife needs to enter the house with the husband. They also understood that newer wives should live within some distance from the first wife. Most of them said that they will have to continue and support the family left outside the project after entering. For them this was an indicator of strength and economic prosperity. Eventually, it was determined that each farm must be operated by a nuclear family of a husband and one wife only because the farms and housing were planned to support only a certain number of family members, but some families find this rule difficult to obey.

An additional social issue that has an immediate economic cost is property crime. It has flourished with the increased economic activity in the area. Local residents, mostly not from Aldeia Nova, do not steal from each other but from what is conceived as "the system", namely the project.[11] They steal everything from construction materials to maize from the field. It is estimated that about a third of the maize crop has being stolen. The local police force is inadequate to fight this type of crimes and as a result, the project administration has suffered considerable losses. Iit is interesting however to mention that when the local Police Chief was asked about crime in Waku-Kungu he did not mention property crime at all and even claimed that crime rates are declining due to economic progress. Previous research has shown that giving land to ex-soldiers reduces crime in the short run (Collier, 1994), but in the case of Aldeia Nova it is the local residents that are most responsible for the property crimes in Waku-Kungu, not the ex-combatants.

[9] Men normally control household cash income. They would give a certain sum to the wife for household expenses, may send a sum to another wife who lives elsewhere, and use the rest for their personal expenses.

[10] Still, women are selling produce and home-made goods such as bread at least twice a week either in the market or on a stall by the house. The proceeds are regarded as the ‘wife’s money’.

[11] One of the reasons for this is that much of the land the project is now cultivating was used by the surrounding population beforehand for their self sustaining domestic uses, so they conceive it as theirs.

Finally, despite the considerable economic and quality of life multiplier effects of the Aldeia Nova project on the entire population of Waku-Kungu and the valley, project families who benefit directly from the project are better off economically than the rest of the population. This has the potential to create social tension.

Project administration

The Logistics Center does not pay farmers the market price for their output and does not charge them market price for their inputs. The underlying philosophy is that farmers are not yet mentally ready to pay real input prices even if they know that they will get good output prices. Rather, it is presumed that if the farmers were to initially be charged real input prices they would prefer not to buy the expensive inputs and would therefore return to traditional cultivation techniques. The plan is to move gradually to market prices after the farmers will get used to the idea that it is worth paying for inputs and having the profit at the end of the month. However, the natural reaction of farmers to this policy is not to sell all of their produce through the Logistics Center. This is especially true for eggs where the market pays a decent premium. It is also the case for vegetables where supervision of output quantities is difficult. Oversight of sales is done by the Village Coordinators, but their effectiveness has been limited. The supervision of milk marketing is easier and more complete because of the computerized milking parlors. The bottom line is that the Logistics Center suffers some losses due to these issues. To reduce the incentives for private sales, the Logistics Center offers prizes for the best-performing farmers, and also pays a quality premium for vegetables, yet this technique has not been particularly effective. It is hoped that in the long run the Logistics Center will move gradually to use market prices for both input and output and thereby mitigate the process of selling outside the system.

For the same reason, the farmers do not pay for the initial infrastructure investments, including the farm buildings and houses, because they are presumed to be reluctant to invest in fixed assets after years of civil war (Grun, 2008). They are charged for the value of livestock, vegetable seedlings, and all other inputs, though, and these expenses are registered as debt. The debt repayment is conditional on performance. When a farm enjoys a reasonable profit, it is charged for debt repayment. Repayments are decided on a monthly basis. As of the end of 2008, total outstanding debt is $1.28 million, a little over $2,000 per household on average. It is hoped that in the future, farmers will be able to actually purchase their farms from the project administration.

Another challenge is that the number of Social Coordinators seems to be insufficient. Initially, the coordinators were expected to divide their time evenly between agricultural and social tasks. In practice they spend most of their time on agricultural tasks and the social issues are therefore not fully addressed. Of the new Social Coordinators that are currently going through training, some will be sent to Phase I villages to assist the existing coordinators. Adding to the challenge is that there is only one female coordinator and there is only one female among the new Social Coordinators going through training. Since the social aspects of coordination (cooking, nutrition, hygiene, health, education) is directed mostly towards women and children, this remains an area which requires additional attention.

Conclusion

The Aldeia Nova project is an experiment with a new concept of rural development that has had remarkable early and interim results. The project

demonstrates the potential of this revolutionary concept of demobilizing families with no prior experience in modern agriculture to a rural area, providing them with modern infrastructure, housing, farm buildings and equipment, agricultural technology, livestock, production inputs, guidance, and a supporting institutional environment. The result is to directly and indirectly generate economically viable food production on a commercial scale, provide well above average incomes for families and to boost the entire local economy. Despite the rapid economic growth which has taken place in Angola in recent years, it is difficult to see how the rural and sparsely populated Waku-Kungu Valley could have participated in this growth in the absence of the Aldeia Nova project. In fact, the most likely outcome without Aldeia Nova would have been that the more able of the local residents would have probably migrated to urban areas to partake in the benefits of the country's growth.

The Angolan government has invested roughly $100 million in the Aldeia Nova project thus far. Much of this was spent on infrastructure which includes roads, drainage, irrigation canals, housing and farm buildings. These investments will serve the region for many years to come and are essential to any agricultural development effort (Haddad, 1997; Calderon and Servan, 2008). The total benefits of the Aldeia Nova project are impressive. The goals were both economic and social. Although the measures are difficult to calculate, great progress on both objectives has been achieved. Specifically, in addition to being on track to generate millions in income for the project residents and for the surrounding region, Aldeia Nova has accomplished the goals of:

- revitalizing a stagnant rural economy
- demobilizing economically inactive families from the city to rural areas and turning them into productive entrepreneurs
- settling families who were former combatants
- reconciliation between former enemies
- providing fresh food to an economy that depends heavily on food imports

In doing these and many other things the project has clearly demonstrated that these ambitious goals are achievable and within the reach of the Angolan people. The $100 million investment seems a reasonable price for these immeasurable outcomes. In the words of the President of the Republic of Angola, Jose Eduardo dos Santos:

> *"Former projects prevented the participation of large parts of the Angolan population. Most of the projects were based on discrimination and capital concentrated in the hands of a few people. The advantage of the new projects and new villages is not only the promotion of integration but also the promotion of unification and national reconciliation so as to make Angola a country that belongs to everyone and is there for everyone."*

In the longer run, the Aldeia Nova project in Waku-Kungu will change its face. As in the Israeli Moshav which served as a model, processes of specialization, differentiation and unbalanced growth will likely occur (Kimhi, 2009). In fact, initial signs for these processes can already be seen in the project villages. These processes are inevitable and are a healthy and natural reaction to economic and market incentives. Flexibility is essential in this regard and the project administration should and is reacting and adjusting its managerial practices according to these changes in the project villages (Kinsey and Binswanger, 1993). The ultimate long-run success of Aldeia Nova will be evident when the foreign experts and the financial safety net will

not be needed anymore. The future challenge is to absorb the next generation, the children of the current settlers, into the economic system of the region.

Aldeia Nova is currently expanding to other regions in Angola. This expansion obviously builds on the lessons learned from the Waku-Kungu project. Although many aspects of the project are region-specific, the experience earned in Waku-Kungu will most likely pay large dividends elsewhere. Of course, the question remains open whether such a project can be implemented on a much larger scale (Ruttan, 1984). The early results would suggest it is quite possible.

The International Food Policy Research Institute (IFPRI) recommends policies that revitalize the smallholder sector in order to eradicate hunger in Africa. As Hazell and Johnson (2004) claimed:

> *"Smallholder agriculture, which is the predominant source of livelihoods in Africa, has proven to be at least as efficient as larger farms when farmers have received similar support services and inputs (seeds, fertilizer, and credit). Policies to improve marketing and service arrangements can insure that small farmers are not disadvantaged in access to markets, technologies, credit, and inputs. Small farmers need to be better organized to purchase inputs in larger volumes and to gain access to markets for their products. Producer cooperatives and CBOs can play a key role here, as can vertical contracting arrangements within marketing chains organized with large private-sector firms."*

They also mention the need to supply infrastructure and rural services and to establish safety nets, among other things. The Aldeia Nova concept includes all these important elements and more.

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Figure 1. Map of Angola, Kuanza Sul Province, and Waku-Kungu

borders of Kuanza Sul Province

town of Waku-Kungu

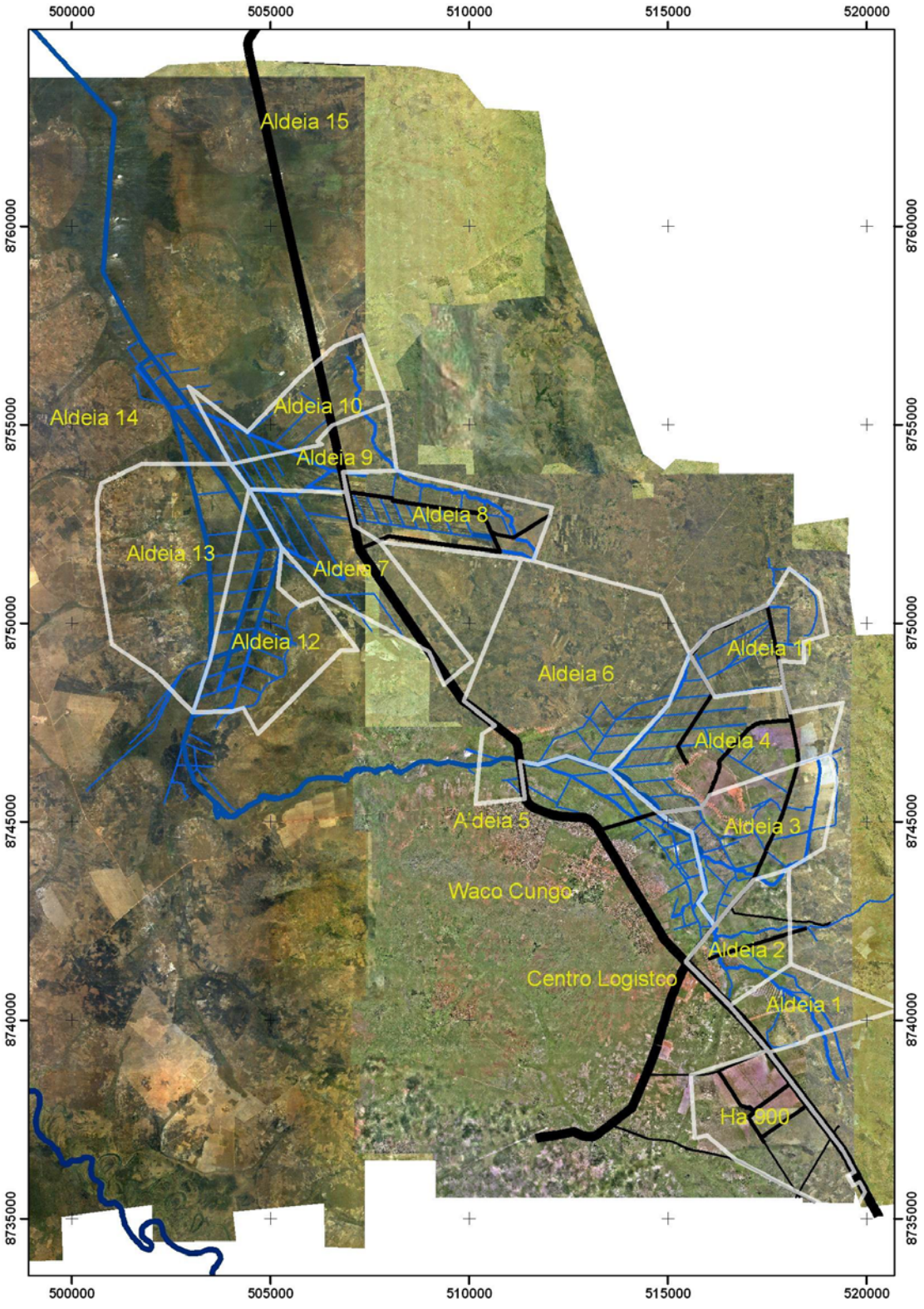

Figure 2. Plan of the Aldeia Nova Project

Note: The white lines indicate the borders of the villages including the adjacent agricultural plots. The blue lines show the drainage canals.

Figure 3. Aerial photo of village 1

Table 1. Village population and livestock enterprises

village	Total houses	Original houses	Livestock farms	Dairy farms	Egg farms	Poultry farms	Pullet farms	Pig farms
phase I								
1	101	28	80	80				
2	50	35	40		40			
3	82	28	60	40			20	
4	87	29	80		80			
6	85	30	58	40		18		
7	29	29	28			28		
8	80	28	74			74		
11	86	30	80					80
total	600	237	500	160	120	120	20	80
phase II								
5	25	25	0					
9	28	24	24		24			
10	43	28	43		43			
12	25	25	20	20				
13	28	26	28		28			
14	30	28	30		30			
15	26	26	20				20	
total	205	182	165	20	125	0	20	0

* Village 20 is planned to have a cooperative dairy enterprise.

Table 2. Production levels in family farms

Output	Units	2007	2008
Livestock products			
Meat			
- Beef	kg	8,288	13,188
- Pork	kg	1,897	6,963
Poultry			
- Live	units		100,977
- Fresh	units		38,926
- Frozen	units	475	70,238
Milk	liters	583,234	931,478
Eggs	units	6,125,257	22,661,591
Fruits and vegetables			
Cabbage	kg	162,235	152,967
Cucumbers	kg	62,975	51,985
Eggplants	kg	44,594	32,821
Potatoes	kg	43,622	36,390
Pineapple	units	35,718	61,529
Peppers	kg	28,009	37,851
Avocado	kg	25,844	25,796
Tomatoes	kg	15,307	8,552
Sweet potatoes	kg	6,895	33,087
Carrots	kg	14,562	11,560
Watermelons	kg	6,014	17,606
Onions	kg	1,082	10,131
Okra	kg	500	2,627
Beans	kg	888	1,355
Melons	kg	368	332
Passion fruit	kg	94	710
Red beets	kg		3,264
Lettuce	kg		277

Table 3. Field crops production

	Area (ha)			Yield (kg/ha)	
Crop	2006	2007	2009	2006	2007
For grains					
Maize	481	1,056	1,279	3,666	2,462
Soy beans	57	433	213	1561	487
Sorghum	59	77	366	1,549	1,244
Sunflowers	29	--	50	682	--
For silage					
Maize	280	138	--	2,504	14,710
Sorghum	250	--	--	2,142	--
Total	1,156	1,704	1,908		

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