

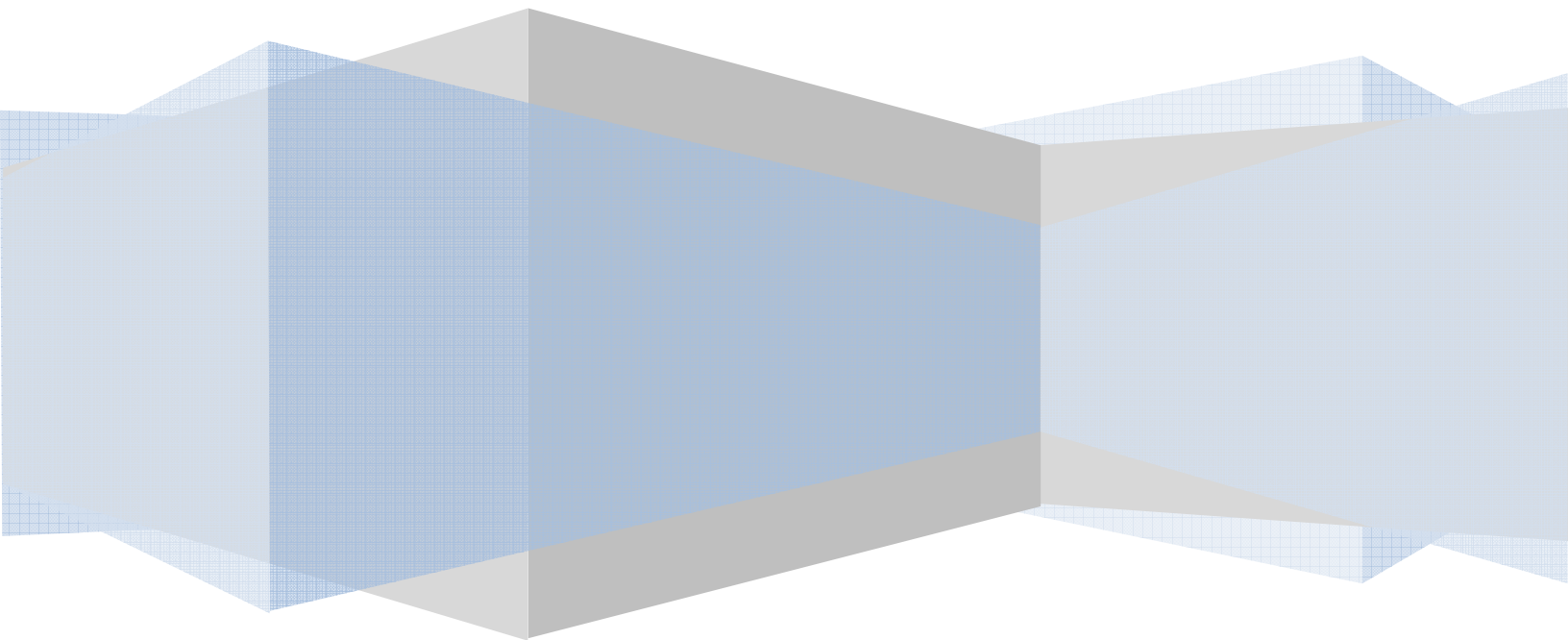
The Development Institute

ADAPTS Ghana Case

Market study for agricultural production in the
Dayi Basin, Volta Region in Ghana.

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1.0 Introduction

The ADAPTS project supports adaptation strategies of farmer households and communities as a reaction to climate change. The project site is the Dayi river basin (DRB), situated in Lake Volta area bordering Togo. The adaptation strategies are in the field of natural resource use and more specifically in water management. The basin experiences a severe degradation of its ecology and a drying out of water resources. On top of that climate change, especially a decrease in rainfall, exacerbates this crisis in livelihoods and ecology

Since 2008 the NGO Development Institute implements a program called Dying Rivers in Woadze community with activities in the field of livelihoods and water management. The program consisted of reforestation of up hill areas, conservation agriculture in savanna areas and irrigated agriculture near perennial streams. In 2009 the ADAPTS program developed out of this initiative, by assisting six farmer groups in increasing revenues per unit of land (especially via agroforestry and irrigated agriculture) as a measure to halt the ongoing depletion of the natural resources (vegetation and soil fertility). These elements will be incorporated into the Dayi Basin plan that is being drawn by Water Resources Commission as part of ADAPTS.

In order to design future livelihood scenarios for the basin ADAPTS proposes to execute a market survey that gives insight in the relative potential of economic activities (rainfed versus irrigated crops). Therefore an evaluation is necessary of revenues of tree crops versus annual agricultural crops, like maize, especially as this crop is threatening the tree vegetation. Also revenues from rain fed and from irrigated crops have to be compared. A second part of this market survey is get insight in product streams to and from Dayi Basin.

The current proposal draws on past experience, such as the comparison of revenues per unit of land between okrahand traditional root crop cultivation, which was part of ADAPTS. Finally the market survey will provide input in the basin plan, in which different socio economic scenarios will be presented.

1.2 Background

Historically the Dayi economy is linked to forest crops like cocoa and coffee. Already around 1900 the Germans chose Kpandu as a center for the development of these tree crops, as they suit the forested mountain ecosystem. The area was colonized mostly by the coastal Ewe people and some people from Brong Ahafo region (Akan). Gradually cultivation of cocoa and coffee spread from in the downhill areas, where these trees could profit from shade and water collected up hill. In the course of this process of commercialization Dayi area attracted migrant laborers, even from Togo. Trees like plantain and oil palm also provided food crops. Wild oil palm seedlings were protected and fruits eventually processed into a source of cooking oil. The continuing importance of Ho as a market for medicinal herbs in Ghana testifies to the importance of the traditional tree based vegetation.

But continuous slash and burn agriculture resulted in a continuous degradation of the environment in Dayi, with as most visible elements deforestation, soil degradation and a drying out of water resources. Perennial streams were reduced to seasonal streams. This culminated in the crisis of 1982 - 84 when bush fires ravaged the vegetation, which resulted in an impoverishment of the region and in out migration of youths. Households turned from cultivating tree crop to annual crops such maize and cassava, which in literature is described as a sign of poverty. In the eighties it was observed that maize cultivation spread to the up hill areas that traditionally served as water catchments for the lower savanna areas. The slash and burn agriculture also reduced the soil fertility. Also the labor burden for women in production of annual crops seems to increase. The impact of these processes was not the same for all households. The clans that first colonized the area claim rights to considerable amounts of land, which they rent to the groups that arrived later in the area. Especially these groups are vulnerable to the crisis.

1.2.1 New Developments

Since the seventies some several new developments in agriculture took place. New tree crops were introduced, like pineapple, mango, citrus and cashew nuts, which were partly cultivated on plantations. The Kingdom Fruits plantation is the most important producer of pineapple and mango's in Dayi. An important development is irrigated vegetable growing, which was introduced by the government (Irrigation Development Authority and the World Bank) via some big schemes, like in Kpandu established in 1978 and in Koleonu 2006 near the municipality of Hohoe. All schemes suffered from top down organization so those local farmers groups were unable to use the facilities. The Kpandu farmers group is relatively successful, with a 40 HP pump and sprinkler set and almost 100 members, supplying okra to around fifty buyers coming from Dayi area, but also from Accra and Togo. In Koleonu large facility was set up with three big pumps and a large concrete canal system that collapsed due to technical problems. The Ve group with fifty members is irrigating part of the land, using one pump, and is the most important supplier of vegetables of Ho. In all facilities most land remained underused, while rain fed cultivation remains important. Positive is that whole sale buyers enter into out grower arrangements with local big farmers for producing peppers for export. The two ADAPTS irrigation sites in Woadze and Vakbo established by farmer groups of around fifteen men and women in 2008 and 2009 are successful in supplying okra, garden eggs and peppers to traders from Dayi (Ho and Hohoe) and Accra.

Also developments in tree crops took place. In recent years the government tried to revitalize the cocoa cultivation by introducing drought resistant varieties via a large nursery established near Hohoe and other communities. The ministry of food and agriculture is also providing spraying services to prevent diseases. Cocoa cultivation seems to be on the rise again.

Also developments in small tree crops take place, like in moringa. This tree crop was introduced in Dayi area around the year 2000 by the EDYM group. Moringa trees grow everywhere in Ghana, even in dry and rocky areas, but with the exception of swampy areas. It is fast growing specie, up till 20 feet a year and leaves can be harvested after one year. Moringa tends to monoculture, as it suppresses other plants. Traditionally it was used as animal feed, improved the health of cattle; and improves soil fertility as it binds nitrogen. The EDYM group exploited a nursery and established in 2000 a private enterprise for processing of Moringa; in 2008 around 100 farmers were contracted as out growers of Moringa. Moringa leaves are used to purify water but most is processed into herbal tea. The enterprise is an NV, using a dryer and a sealer. In 2008 the daily turn over was 250 bags of tea, packed by 12 women who earn GHC. 2.5 a day; annual turnover was 25.000 Cedi, while the make is certified. Sale is to supermarkets, restaurants and specialty shops in Accra. In November 2008 a contract was signed with a South African company.

1.3 Development Institute: GEF and ADAPTS

The 2008 GEF funded Woadze pilot aimed to stop the Dying of Rivers by a combined introduction of reforestation in uphill areas, conservation agriculture in the savanna area and irrigated vegetable cultivation along the Dayi River using small motorized pump. The ADAPTS follow up program aims to revitalize the economy of communities in Dayi by restoring biodiversity through introduction of tree based economies (for example moringa), conservation and irrigated agriculture. ADAPTS does not at this moment deal with the cocoa sector, that is left to the Min of Food and Agriculture that is currently introducing drought resistant cocoa seedlings. ADAPTS activities are implemented within the context of a Dayi basin plan, that is guided by Water Resources Commission. The basin committee was installed in May of 2010 and consisted of representatives of Hohoe Municipal authorities, civil societies and other relevant stakeholders. A main goal of the basin plan is to protect the quality of drinking water, to limit the abstraction of water for irrigation from the rivers and to promote measures, such as a buffer zone policy, that will guarantee sustainable water resource management.

ADAPTS promotes the establishment of small scale irrigation systems along the River Dayi enabling farmer groups to make the transition from rain fed to irrigated agriculture. Irrigated agriculture is promoted in a holistic approach , that is by taking into account the ecology and incorporating measurements of the total water flow in Dayi river (so as not to deplete scarce water). Due to continuous degradation of the vegetation the base flow of Dayi River in the dry season is measured to approach close to zero, which means that the potential to irrigate is limited. The water use by the farmer groups has to follow the licensing system of the Water Resources Commission. Beside this short term intervention in water use ADAPTS also aims to guarantee long term availability of water through introducing buffer zone and agroforestry components in Dayi Basin.

To restore the vegetation DI promotes sustainable use of resources by communities. This also means that measures are taken to stop the slash and burn agriculture by introducing conservation agriculture and zero cropping. Composting and application of manure from small cattle is aimed to limit the amount of land under cultivation. Problematic is the presence of massive amounts of bad weeds, while a tradition of collecting animal manure is absent due to absence of stables. In current circumstances collecting of manure will increase the labor burden of women in the household.

ADAPTS builds upon the experience of three farmer groups at Kpandu, Koleonu and Woadze, while five additional groups are prepared to implement irrigated systems. The Woadze experience reveals that irrigation is not self evident as farmers have to develop expertise on proper soil and water management and disease control, while the build up of the farmer associations goes step by step. Since 2008 the Woadze changed from communal to individual cultivation and sale. The 2008 harvest was easily sold at Ho market, but diseases ruined the 2009 harvest. In a May 2010 session the six ADAPTS groups chose sprinkler irrigation as the most feasible option, partly following the example of Kpandu. Use of sprinklers has the advantage that irrigated plots do not need leveling of land, as compared to irrigation by gravity. But use of sprinklers necessitates relatively heavy pumps, also as compared to the initial ones being used by the Woadze and Bakai groups. The optimal acreage for a farmer group was estimated at ten acres, which brings forward costs of land preparation.

2.0 Marketing

Marketing is a critical element in the adaptation strategy of farmers, as it determines the value of crops produced. Important is the comparison between;

- a) Tree and annual agricultural crops like cassava and maize, as at the moment the vegetation is being eaten by the annuals.
- b) The comparison with irrigated vegetables, as these provides relatively high revenue per unit of land.

ADAPTS already started by comparing irrigated okra cultivation with traditional cultivation of root crops, an exercise executed in cooperation with Ministry of Food and Agriculture. The study related input in labor and capital (seeds, tools, storage) with output on plots of half an acre. In the current survey the following three product groups are proposed: *Irrigated crops*: okra versus pepper, also as the market for okra seems saturated; *Tree crops*: cocoa as the most important cash crop to be compared with crops, like moringa and or mango; *Annuals*: like cassava or maize

2.1 ACTIVITY A: profitability of crops

This done by using the expertise of the district administration in Dayi, especially the Ministry of Agriculture at Ho. They will provide data on the cropping history of the study areas and revenue figures of crops per unit of land (including cost benefit. Existing literature will also be reviewed.

Focus Group Discussions amongst representatives of five farmer participating in the ADAPTS

Program will provide extra insight. In a two day session members of the groups will be guided by DI and Both ENDS in determine revenue trends per crop. This will eventually lead to

recommendations in crop choices, if possible distinguishing per ecological zone.

Activity B: Dayi Basin in the Ghana market

The proposed market study further aims to get insight into the dynamic of the market in Dayi basin by analyzing the wholesalers active in two key places, Kpandu and Ho. Kpandu is the main export market for irrigated crops, while Ho is the main city market in Dayi basin. This survey will determine the volume of product streams in and out of Dayi basin and recent trends in these streams. This survey will be executed by visiting both market places and interviewing farmer representatives and whole salers. Questions are: number of whole salers, origin (from Dayi or), main products and turn over; import to Dayi area or export outside of

Dayi; profitable products. This survey will result in insight in the volume of the local market in Dayi, which is an indicator for the risk of production. Also insight in existing product streams out of Dayi is important as the farmer group scan link to these streams. Finally insight in trend of profitability will be gained, which is important as eg the market for okra showed signs of being saturated.

This description of the Dayi Basin in the Ghana market will also play a role in the Dayi Basin plan.

3.0 Results

3.1 Introduction

On the workshop of 3rd March, 2011, 25 women attended and on 4th March, 2011, 16 males attended, representing the six farmer groups, the Ve group, while also some individual farmers joined. One commercial farmer and his wife were present, as well as an export trader that contracted pepper cultivation for the UK market.

As the method of focused group discussions appeared to have its limitations we had to down size our expectations. Measuring the revenues per crop per unit of land is difficult as well as comparing the revenues per crop. Also distinguishing trends between the three different ecological zones is difficult. Nevertheless we arrived at sketchy evidence of differences in livelihoods per ecological zone. Also we obtained a rough idea of revenues per crop and of changes in the importance of crops.

We only arrived at a sketchy pattern of product streams entering and leaving Dayi basin. Ho, Hohoe and Kpandu are main marketing centers. Dayi exports cocoa, vegetables (Kpandu), tree crops like moringa and mango and recently cassava. Dayi self sufficient in plantain and maize. Dayi imports palm oil and yams.

3.2 Tree Crops

The declining importance of cocoa was confirmed as only five men and five women own cocoa plantations, while in the recent years investments in new plantations take place, following efforts of the government to revitalize this culture. Acreage per farm varies from a mean figure of around two acres to a maximum of five acres.

The number of farms with oil palm trees is limited to four men and four women. In the past plantations were established by allowing the best wild seedlings to grow. Women process the fruits into palm oil, that is mostly for home consumption, although four farmers sell a surplus. One farmer mentioned he produced palm wine, which is done by cutting down the tree. Accidental evidence suggests that this happened during the past decades, which is a clear

example of how the households eat up their natural resources in times of poverty. Due to declining rainfall new trees have difficulty developing (?).

One acre of oil palm produces 14 gallons of palm oil (one gallon is 36 cedi). A household uses almost 4 gallons a year, from ¼ acre; or 2 bottles per month; (one gallon measures 7 bottles).

A majority of households own plantain trees, but mostly for household consumption; processing of the surplus for beer brewing is not known. It is unclear if new plantations are established (plantations suffer from old age ?)

Oranges are grown in all three zones of Dayi, intercropped between cocoa trees. Only four farmers own orange trees, mostly of old age and in limited numbers. The Dep of Agric does not support this cultivation. Three farmers own 10 to 15 trees and one farmer even several tens of trees. Demand in Dayi is limited and prices are vulnerable to slump. The biggest owner hired a truck with others in order to sell the oranges in Togo.

Mango cultivation is of limited importance and 4 farmers have respectively 3, 4, 5 and 2 mango trees. The surplus is small and marketing is not systematic. Agric does not support this crop.

Moringa is cultivated by members of the Bakai farmers' group. In 2008 they planted around 500 moringa trees, but sale of fresh leaves was not profitable. The group started processing the leaves in order to process it into tea, but did not succeed in obtaining a certificate. The dried leaves are sold on the local market for herbal use, but only for average prices. Also members of the Woadze group own moringa trees, but no info is available on revenues.

3.3 Food crops

Cassava is grown in all three regions and by all households. Several households sold a surplus that is twice the amount consumed at home; one household cultivated as much as five acres. Part of the cassava is sold at Ho market to a trader for sale in Accra; part of this cassava is processed into gari (by the trader or by the women?)

Cassava is grown in units of 12 by 12 or 144 m². Seven units or 1000 m² may be sufficient to cover for household needs. Total revenues per acre amount to 600 cedi and costs to 150 cedi, so in total 450 per acre (or 28 units)

Six households grow yams, but the Dayi area imports yams from the savanna areas in Ghana.

Most households cultivate maize, but mostly for household consumption while a surplus is sold. Some respondents claim monetary revenue from sale of maize surpasses that of cassava.

Vegetable growing is of increasing importance, especially irrigated cultivation of okra, garden eggs and pepper. Revenues per acre differ from rainfed to irrigated.

Rain-fed okra and garden eggs produce monetary revenue per acre of 300 to 500 cedi.

Irrigated okra and garden eggs a revenue of 800 to 1600 cedi

Rain fed pepper a revenue of 1200 cedi; Irrigated pepper of 5000 cedi

3.4 Gender

All crops have specific gender relations in the household, which is the most important socio economic unit. This means that a specific husband to wife relation exists with respect to control over land, trees and revenues from crops harvested. The household in Dayi area is universally African as husband and wife each have sources of revenue. The husband is responsible for the general household expenses, while the wife for the kitchen. In general Dayi area shows a gender inequality in control over revenues, as the wife marries into the compound of the husband, who tends to control the trees and the fertile soils. But the gender inequality is not sharp, which may have to do with the Ewe back ground of the people. Several forms of cooperation between husband and wife appear to exist, while women do inherit from their fathers and can act as independent farmers.

Trees seem a domain of males, although the inequality is not sharp. In the nursery established by DI both men and women are active, but most of the seedlings are planted on male plots, although a part are female owned.

Cocoa trees are mostly owned by the husband, but women assist in harvesting and drying the cocoa. They are paid for this, by receiving a share of the crop. A total of five women own cocoa trees, while one woman from Baika established a new plantation in 2009.

Oil palm trees are owned by four men and four women but information on amount of trees is absent. Women do most of the processing after which the oil is divided equally between husband and wife. In most cases women do the marketing of the processed oil.

Orange trees seem mostly owned by males, but use is for household needs; and the biggest owner is a woman who inherited the trees from her father. She is also hires a truck with other fiends to transport their harvest to Togo.

Mango trees seem male owned but are mostly for household use; so harvested by women.

3.4.2 Food crops and Gender

Cassava is mostly grown by women, but also by the husband or by husband and wife combined.

A big part is for household consumption but most women sell part of the cassava to earn monetary revenue, and sometimes the surplus sold is bigger than the part consumed.

Maize is cultivated by both husband and wife, but with mutual help. Women usually assist in sowing and harvesting of the crop. Women in most cases do the marketing of the produce.

Yams are cultivated by both husband and wife, but for preparing the land by constructing mounds male labor is necessary.

In irrigated vegetable growing husband and wife closely cooperate, although husband tend to control the biggest acreage cultivated, organize cultivation of land (ploughing and irrigation) and are represented in farmer groups. But wives have a key role in organizing weeding, harvesting and sale of crops on the market. And in some households wives are in control of all these activities.

4.0 Conclusion

Marketing in Dayi River Basin is challenging as food crops become abundant during the rainy season making supply more than demand leading to price reduction. Low prices affect farmers in several negative ways affecting the livelihood of farmers and their dependants. It is important for farmers in Dayi source for external markets or staggers their cropping seasons with the introduction of irrigation systems. Women are the main marketing agents in the Dayi River Basin. It is worth noting that the cost of irrigating farming is higher than the normal rain-fed agriculture but the outcome from this venture is enormous.