

Market Gardening Activity and Improvement of Living Conditions for Women from the "Benkadi" and "Dèmèton" Associations in the Rural Commune of Sanankoroba, Mali

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ABSTRACT

This project analyzes market gardening activity and improvement of living conditions of women from the "Benkadi" and "Dèmèton" associations in the rural commune of Sanankoroba, Mali. It aims to understand the practice of market gardening by women's associations in the rural commune of Sanankoroba; the constraints and benefits of the activity. The methodology is based on field observation, documentary research and questionnaire surveys. Field observation enabled us to visit the various market gardening zones in the commune and identify the market gardening areas of two women's associations, Dèmèton and Benkadi. A literature review was carried out using documentary research. The questionnaire survey was carried out with 31 people from the Dèmèton association and 23 from the Benkadi association. The results of the study revealed that the market gardeners were adults, and that the surface areas farmed by 85.2% of the members of the two associations varied between 1 and 2 ha, with 14.8% of the market gardeners farming less than 1 ha. The crops grown are okra, potatoes and eggplants. The equipment used is rudimentary, due to insufficient financial resources. Constraints such as lack of fencing, fertilizer and equipment are also a problem. Market gardening enabled 26% of respondents to pay for their children's schooling and family health, and 14.8% to buy food. Income from market gardening is used for other family expenses (health, clothing, ceremonies, etc.).

Key words: market gardening, improvement, living conditions, rural commune, Sanankoroba, Mali

INTRODUCTION

In Africa, market gardening is a horticultural activity. Horticulture deals with the production of ornamental plants, shelter trees, fruit trees (arboriculture) and vegetables (maraichère) (Ghazi, 1992). Vegetable crops worldwide are not produced under the same climatic or technical conditions (Bationon, 2009, p.43).

In Mali, market gardening goes back a long way. It was practiced in home gardens and focused mainly on okra, onions, chillies, cowpea leaves and so on. It was after the colonial period that European-style vegetables (lettuce, beet, cabbage, carrots, melons, cucumbers, improved tomatoes, etc.) were introduced to Mali.

Today, market gardening is developing in areas lacking surface water, and is increasingly integrated into farming systems that are essentially dependent on uncertain rainfall and marked by their extensive nature (Pourtier, 2001, p.52). Vegetables have become part of the dietary habits of both urban and rural populations (Sissoko, 2010, p.11). Market gardening is playing an increasingly important economic role in the fight against poverty in rural areas.

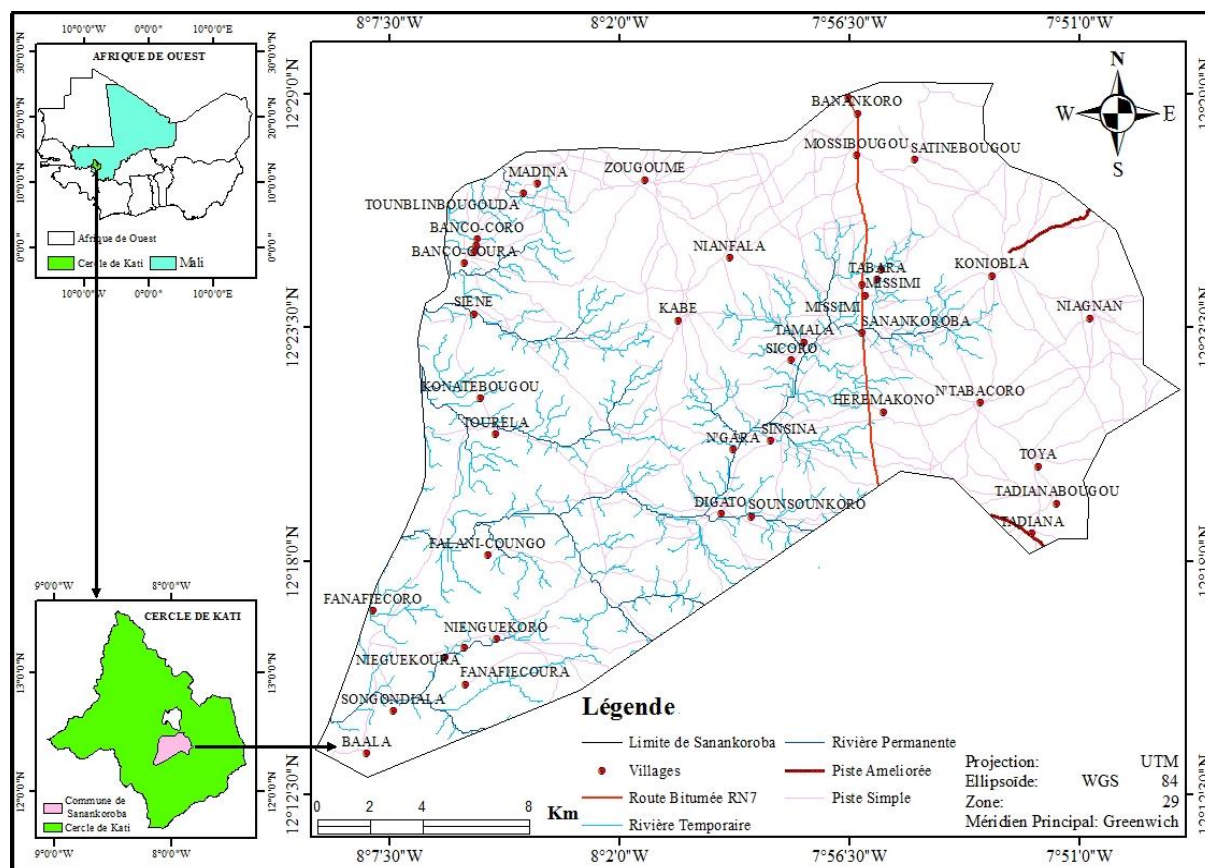
Falling rice yields partly explain the development of this activity, which keeps both men and women busy (Oei, 1983). In the rural commune of Sanankoroba, market gardening is practiced in almost all rural concessions. This project is entitled: market gardening activity and

improvement of living conditions of women from the "Benkadi" and "Dèmèton" associations in the rural commune of Sanankoroba, Mali.

MATERIALS AND METHODS

Presentation of the Study Area

The commune of Sanankoroba is located between the 4th and 8th degrees west and between the 12th and 13th degrees north. The commune's reference coordinates are 7° to 8° west and 12° north (Map 1).



Map 1: Presentation of the study area

The rural commune of Sanankoroba, one of three communes (Sanankoroba, Bougoula and Dialakoroba) in the Sanankoroba arrondissement, comprises 26 villages (Sanankoroba, Banankoro, Koniobla, Fatinébougou, N'tabakoro, Sicoro, Gnianian, Toyan, Sinsina, Dibato, Tamala, Kabé, Niafala, Ziguimé, Tourela, Baala, Madina, Siémé, Falani-Kungo, Togondiala, Kadiana, Kadianabougou, Bangokoro, Bangokoura, Nièzekoro, Nièzekoura). The commune is bordered: to the east by the communes of Bougoula and Mountougoula; to the west by the commune of Niagadina and the Niger River; to the north by commune VI of the District of Bamako and to the south by the commune of Dialakoroba. Located 35 kilometers from Bamako on Route Nationale 7 (RN7), it covers an area of 615.5 km². The Commune of Sanankoroba is landlocked. With the exception of RN7, the rural tracks are degraded during the rainy season. Accessibility remains a challenge for the Communal Council, as there are almost no communication routes in the western and eastern parts of the commune.

Equipment

In this study, data collection materials and processing tools were used. For data collection, we developed and administered a quantitative survey questionnaire to market gardeners. We also used a Dictaphone and a camera. Microsoft Excel and ArcGis software were used for data processing. The data were transcribed into tables, figures and maps. The various illustrations were then analyzed and commented on.

Methods

Three main methods were adopted to carry out this work. These were field observation, documentary research and a questionnaire survey.

- *Field observation*

In order to get to know the realities of the study area, we travelled around. Our travels enabled us to visit the various market gardening zones in the rural commune of Sanankoroba, including those of the Dèmè ton and Benkadi associations. Photographs were also taken.

- *Documentary research*

Documentary research was carried out in libraries (Mairie de la Commune de Sanankoroba, USSGB, Centre Djoliba) and on the Internet. The documents used were articles, reports, theses, etc.

- *Questionnaire surveys*

The field survey was carried out in two phases: making contact and administering the questionnaires.

- *Sampling*

On the market garden sites of the two associations (Dèmèton and Benkadi), 54 market gardeners were identified. All market gardeners were subjected to the questionnaire.

RESULTS

Characteristics of Respondents and Association Membership Strategy

Age and marital status

Age of respondents

Market gardeners in Benkadi and Dèmèton are aged between 18 and 40 (Chart 1).

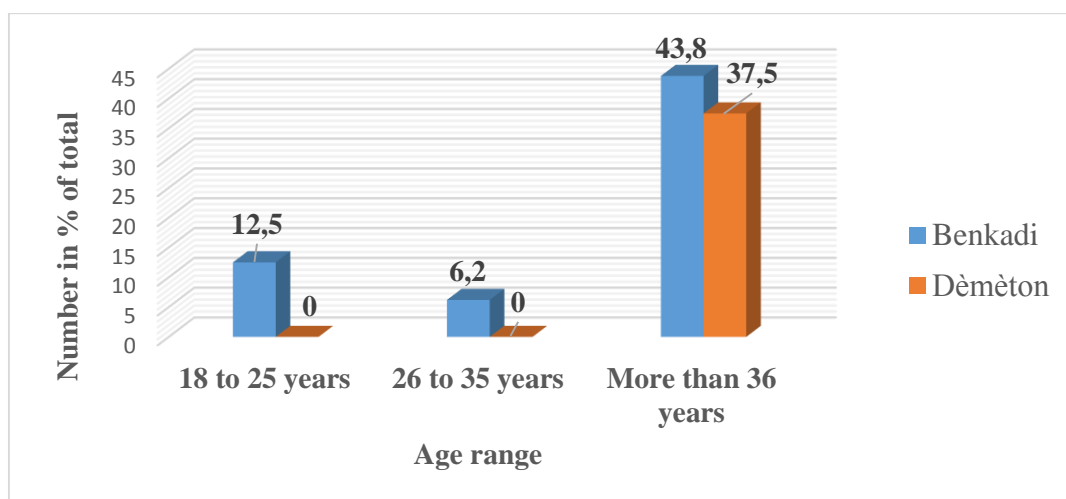


Figure 1: Distribution of respondents by age

Source: Field survey, August 2023

Analysis of graph 1 reveals that the majority of market gardeners surveyed are aged 36 and over. Indeed, the proportion of market gardeners in this age bracket and over is 43.8% for the Benkadi association and 37.5% for Dèmèton. Market gardeners are adults and physically fit for the activity, which is strenuous (especially watering) for people of advanced age.

Marital status

In terms of marital status, widows represent 25% (12.5% of Benkadi and 12.5% of Dèmèton respondents), against a minority of bachelors (6.3% of Benkadi respondents) (Chart 2).

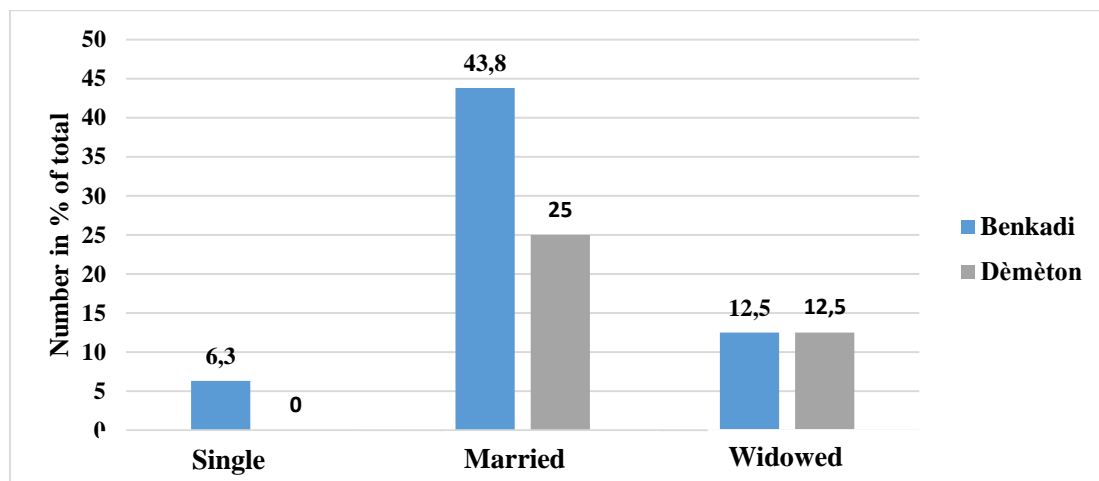


Figure 2: Distribution of respondents by marital status

Source: Field survey, August 2023

Analysis of graph 2 shows that 43.8% of respondents in the Benkadi association and 25% in the Dèmèton association are married. Widowed, single and married women in Benkadi and Dèmèton work to support their families.

A level of education dominated by illiteracy

In the rural commune of Sanankoroba, 14.8% of those surveyed (5.5% for the Benkadi association and 9.3% for the Dèmèton association) had attended Koranic school or medersa (Table 1).

Table 1: Distribution of respondents by level of education

Association \ Level of education	Benkadi		Dèmèton		Totals	
	Number	%	Number	%	Number	%
Illiterate	18	33,3	11	20,4	29	53,7
Primary	10	18,5	7	13	17	31,5
Koranic/ medersa	3	5,5	5	9,3	8	14,8
Total	31	57,3	23	42,7	54	100

Source: Field survey, August 2023

Analysis of Table 1 shows that more than half (53.7% of respondents, including 33.3% in the Benkadi association and 20.4% in the Dèmèton association) are illiterate, compared with 31.5% who have only completed primary school. Education is essential for market gardening and improving profitability.

Secondary activities

Of those surveyed, 43.75% carried out other activities in addition to market gardening (Chart 3).

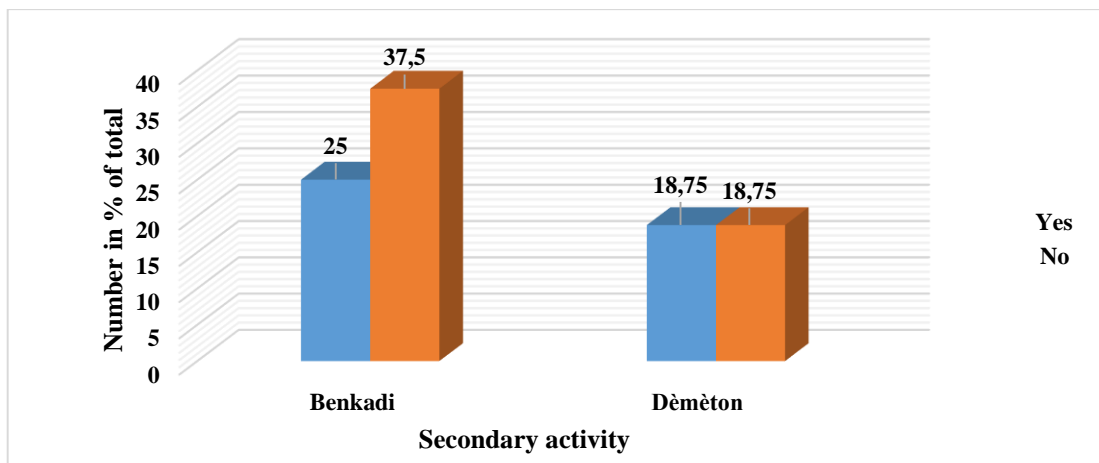


Figure 3: Distribution of respondents according to whether or not they have a secondary activity

Source: Field survey, August 2023

Analysis of graph 3 reveals that 56.25% of respondents (37.5% of members of the Benkadi association and 18.75% of members of the Dèmèton association) do not practice market gardening alone, which is nevertheless their main activity. These activities include petty trade, handicrafts, logging, etc.

Association membership conditions

In the rural commune of Sanankoroba, membership conditions for the "Benkadi and Dèmèton" associations vary from one respondent to another. The results of our surveys revealed that 42.6% of respondents joined the association through family ties (Table 2).

Table 2: Association membership conditions

Association	Benkadi		Dèmèton		Totals	
	Number	%	Number	%	Number	%
Membership conditions						
Relationship	7	13	16	29,6	23	42,6
Inherited from husbands	15	27,8	4	7,4	19	35,2
Imitating fellow members of the association	9	16,7	3	5,6	12	22,2
Help from a friend						
Total	31	57,5	23	42,5	54	100

Source: Field survey, August 2023

The proportion of respondents who joined their association by inheritance is not negligible. It represents a total of 35.2%, including 27.8% for members of "Benkadi" and 7.4% for those of "Dèmèton". Some respondents have imitated fellow members of the association. This was the case for 18.7% of members of the "Benkadi" association.

In rural areas, the formation of associations often leads to social cohesion and socio-economic development.

Working Conditions of Association Members

A wide variety of market-gardening areas in use

The results of our surveys reveal that the market garden areas farmed by the "Benkadi and Dèmèton" associations vary from less than 1 hectare to 2 hectares (Table 3).

Table 3: Surface area of market gardening areas in the "Benkadi and Dèmèton" associations

Association	Benkadi		Dèmèton		Totals	
	Number	%	Number	%	Number	%
Surface area of market garden						
Less than 1ha	7	13	1	1,9	8	14,8
1 to 2ha	24	44,4	22	40,7	46	85,2
Total	31	57,4	23	42,6	54	100

Source: Field survey, August 2023

Analysis of the table shows that plots of between 1 and 2 hectares are farmed by 85.2% of market gardeners. On the other hand, 14.8% of plots are less than 1 ha in size. This is due to the fact that women are organized into associations, which require a fairly large surface area for their activity.

The duration of market gardening varies from one respondent to another. It ranges from 2 to 12 years, according to 43.7% of "Benkadi" respondents and 31.3% of "Dèmèton" respondents (Chart 4).

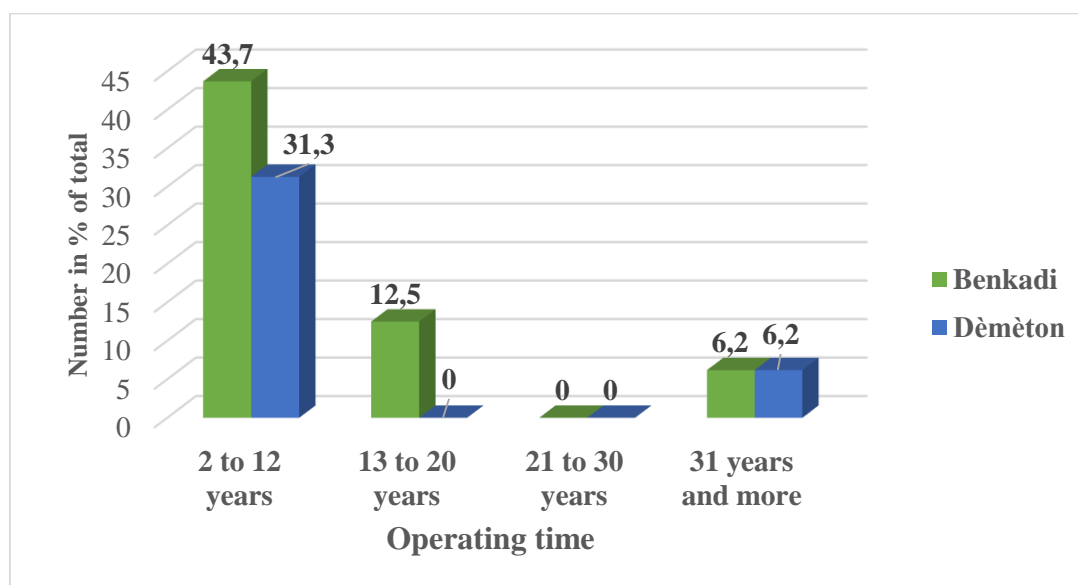


Figure 4: Duration of land use

Source: Field survey, August 2023

Analysis of graph 4 reveals that 12.4% of respondents in Benkadi and Dèmèton have been using market gardening for 31 years or more. These data show that market gardening is not a recent phenomenon in the commune of Sanankoroba, and represents an income-generating activity that contributes to food security.

The association's market garden acquisition strategies

In the rural commune of Sanankoroba, the "Dèmèton" association's market garden space was acquired thanks to the Mairie and local people, according to 9.3% of respondents (Table 4).

Table 4: Land acquisition strategies of the "Benkadi and Dèmèton" associations

Association	Benkadi		Dèmèton		Totals	
	Number	%	Number	%	Number	%
Space acquisition						
Town hall and indigenous people	0	0	5	9,3	5	9,3
Project and NGOs	9	16,7	4	7,4	13	24,1
Only with Town Hall	9	16,7	7	13	16	29,6
Indigenous	13	24,1	7	13	20	37
Total	31	57,5	23	42,7	54	100

Source: Field survey, August 2023

Table 4 shows that for the respondents, the market gardening land used by the associations was acquired from local people. These respondents represent 37.5%, including 24.1% for "Benkadi" and 13% for "Dèmèton". These areas have been acquired thanks to the Town Hall, NGOs and projects.

Work Organization, Production Equipment and Crops Grown

Work organization of association members

Our surveys reveal that the "Benkadi" and "Dèmèton" associations each have a supervisor and a secretary (Table 5).

Table 5: Role of members of the "Benkadi and Dèmèton" associations

Association	Benkadi		Dèmèton		Totals	
	Number	%	Number	%	Number	%
Role of members						
Supervisor	4	7,4	4	7,4	8	14,8
Single member	12	22,2	7	13	19	35,2
Advisor	6	11,1	4	7,4	10	18,5
Intermediary	6	11,1	4	7,4	10	18,5
Secretary	3	5,6	4	7,4	7	13
Total	31	57,4	23	42,6	54	100

Source: Field survey, August 2023

We note that 35.2% of respondents are simple members of the association, 18.5% play the role of advisor and 18.5% play the role of intermediary. Better organization means faster decision-making.

Association work equipment

With regard to work equipment, according to 33.4% of "Benkadi et Dèmèton" members, the equipment used for market gardening activities remains the watering can, pickaxe and hoe (Table 6).

Table 6: Equipment used by members of the "Benkadi and Dèmèton" associations

Association	Benkadi		Dèmèton		Totals	
	Number	%	Number	%	Number	%
Work equipment						
Rakes, shovel, daba, wheelbarrow	12	22,2	8	14,8	20	37
Watering can, pickaxe, hoe	10	18,5	8	14,8	18	33,4
Organic and chemical fertilizer	6	11,1	4	7,4	10	18,5
Rope	3	5,6	3	5,6	6	11,1
Total	31	57,4	23	42,6	54	100

Source: Field survey, August 2023

Analysis of Table 6 also reveals that rakes, shovels, daba and wheelbarrows are used by 37% of "Benkadi" and "Dèmèton" members. The use of rudimentary equipment by women is linked to a lack of financial resources. Photo 1 shows some of the equipment used by members of the "Benkadi" association.



Photo 1: Some of the equipment used in the "Benkadi" market garden

Source: Own photo, August 2023

In this market garden, a woman holding a watering can is seen watering the cultivated crops, and another person holding a daba is seen weeding.

Vegetables as the main crops grown

Tomatoes and chillies are the most widely grown crops, according to 13% of "Benkadi" members and 9.3% of "Dèmèton" members (Table 7).

Table 7: Crops grown by surveyed members of "Benkadi and Dèmèton"

Association	Benkadi		Dèmèton		Totals	
	Number	%	Number	%	Number	%
Cultivated speculations						
Tomato and pepper	7	13	5	9,3	12	22,3
Banana and lettuce	9	16,7	7	13	16	29,6
Okra and yam	9	16,7	7	13	16	29,6
Potato and eggplant	6	11,1	4	7,4	10	18,5
Total	31	57,3	23	47,2	54	100

Source: Field survey, August 2023

Analysis of Table 7 reveals that, on the one hand, okra and yam are the most widely grown crops according to 29.6% of members of the "Benkadi" and "Dèmèton" associations. On the other hand, potatoes and eggplants are cultivated according to 11.1% of surveyed members of "Benkadi" and 7.4% for "Dèmèton". Photos 2 and 3 show the crops grown by the Benkadi and Dèmèton associations.



Photo 2: Speculations cultivated by "Dèmèton"



Photo 1: Speculations cultivated by "Benkadi"

Both photos show a variety of crops: potatoes, banana trees, papaya trees, lettuce beds, etc.

Well water is the main source of supply for market gardeners in the rural commune of Sanankoroba. The number of boreholes used by market gardeners in the Benkadi and Dèmèton associations is very limited. Photo 4 below shows a borehole used by the "Dèmèton" association.



Photo 4: Water tower connected to a borehole in the "Dèmèton" market garden area

Source: Own photo, August 2023

The "Dèmèton" market garden is equipped with a borehole and water tower. This borehole, powered by solar panels, is essential for watering a larger area in a minimum amount of time.

Difficulties Associated with Market Gardening Activities

Constraints to market gardening

The results of our surveys reveal that the vast majority of "Benkadi et Dèmèton" members assert the existence of constraints that handicap their activities (Chart 5).

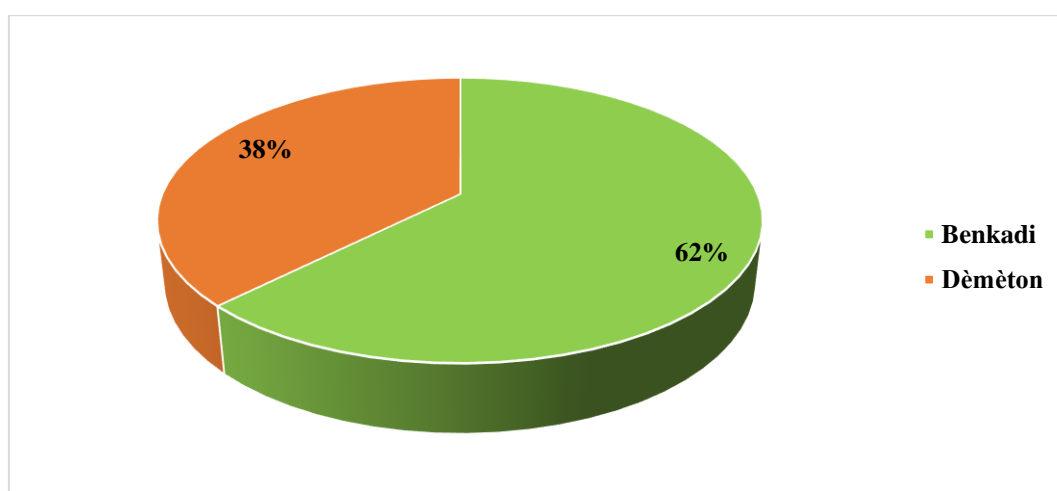


Figure 5: Existence of constraints in market gardening practice

Source: Field survey, August 2023

Analysis of graph 5 shows that market gardeners (62% of "Benkadi" members and 38% of "Dèmèton" members) face enormous constraints.

Nature and causes of constraints

The constraints that handicap market gardening are diverse in the rural commune of Sanankoroba. For 16.7% of "Benkadi" members and 7.4% of "Dèmèton" members, the lack of modern equipment is a major constraint (Table 8).

Table 8: Nature of difficulties encountered by market gardeners

Association \ Nature of difficulties	Benkadi		Dèmèton		Totals	
	Number	%	Number	%	Number	%
Lack of water	10	18,5	8	14,8	18	33,3
Lack of fencing	6	11,1	7	13	13	24,1
Lack of modern equipment	9	16,7	4	7,4	13	24,1
Lack of fertilizer	6	11,1	4	7,4	10	18,5
Total	31	57,4	23	42,6	54	100

Source: Field survey, August 2023

Analysis of Table 8 shows that lack of water is the main constraint for 18.5% of "Benkadi" members and 14.8% of "Dèmèton" members. These market gardeners also have to contend with the lack of fencing and easy access to inputs (fertilizers).

For 5.6% of "Benkadi" members surveyed, one of the causes of constraints is insufficient water supplies (Table 9).

Table 9: Causes of difficulties encountered by members of the "Benkadi" and "Dèmèton" associations

Cause of difficulties \ Association	Benkadi		Dèmèton		Totals	
	Number	%	Number	%	Number	%
Difficult access to financing	25	46,3	19	35,2	44	81,4
Difficult access to production equipment	0	0	4	7,4	4	7,4
Difficult access to inputs	3	5,6	0	0	3	5,6
Insufficient water supply	3	5,6	0	0	3	5,6
Total	31	57,5	23	42,6	54	100

Source: Field survey, August 2023

Analysis of Table 9 shows that difficult access to financing is the cause of constraints according to 46.3% of "Benkadi" members and 35.2% of "Dèmèton" members. Finally, difficult access to production equipment was cited by 7.4% of members surveyed in "Dèmèton".

The causes of market gardening constraints are therefore numerous, and strategies need to be undertaken by members of both associations to deal with them.

Multiplication of Water Towers as a Factor in Improving Market Gardening Practices

The survey revealed that 18.5% of "Benkadi" members surveyed and 7.4% of "Dèmèton" members surveyed felt that boreholes equipped with water towers would help develop market gardening (Table 10).

Table 10: Solutions recommended by members of the "Benkadi and Dèmèton" association

Recommended solution \ Association	Benkadi		Dèmèton		Totals	
	Number	%	Number	%	Number	%
Voluntary help	6	11,1	0	0	6	11,1
State and NGO aid	12	22,2	15	27,8	27	50
Community assistance	0	0	4	7,4	4	7,4
Castle multiplication	10	18,5	4	7,4	14	25,9
Government and town hall assistance	3	5,6	0	0	3	5,6
Total	31	57,4	23	42,6	54	100

Source: Field survey, August 2023

An analysis of Table 10 reveals that 22.2% of "Benkadi" and 27.8% of "Dèmèton" members feel that the state and NGOs should help develop market gardening. Despite the constraints, market gardening makes a major contribution to improving living conditions, increasing sources of income and combating food insecurity.

Income Generated by Market Gardening, a Major Support for Families in the "Benkadi" and "Dèmèton" Associations

Market gardening in the commune of Sanankoroba generates income that supports families in many ways (Table 11).

Table 11: Use of income generated by market gardening by members of the "Benkadi" and "Dèmèton" associations

Expense items	Association		Benkadi		Dèmèton		Totals	
	Number	%	Number	%	Number	%	Number	%
Family health	5	9,3	7	13	12	22,2		
Schooling for children	10	18,5	4	7,4	14	26		
Creation of new activities	6	11,1	4	7,4	10	18,5		
Acquisition of capital goods and manufactured products	6	11,1	4	7,4	10	18,5		
Purchase of foodstuffs	4	7,4	4	7,4	8	14,8		
Total	31	57,4	23	42,6	54	100		

Source: Field survey, August 2023

The study reveals that income from market gardening is used to meet family needs. Thus, for members of the "Benkadi" association, 16.6% pay for their children's schooling. 7.4% use their income to buy food. For 13% of members of the "Dèmèton" association, health care is the main item of expenditure on market garden income. In contrast, 11.1% of "Dèmèton" members and 7.4% of "Benkadi" members use income for other expenses (Table 11). In this respect, market gardening is used to support families in general (improved living conditions, source of income for producers, contribution to food security, etc.).

DISCUSSION

The study reveals that market gardening is a long-established activity practised by the populations (men and women) of the rural communes. Under the headings below, we show how this activity is presented by certain authors

The study reveals that market gardening is a long-established activity, practiced by both men and women in rural communes. The following sections show how this activity is presented by some of the authors.

✓ *Diversity of crops grown*

The results of the study reveal that in the rural commune of Sanankoroba, several crops, notably potatoes, bananas, salad plants, etc., are cultivated. In this respect, our results are similar to those of a study carried out by Sani Ali (2019, p) in the commune of Malbaza (Niger), where market garden producers grow a variety of crops (onions, cabbage, tomatoes, lettuce, carrots, chillies, peppers, cucumbers, etc.).

✓ *Market gardening, an activity that improves people's living conditions*

In West African countries, market gardening is practiced by both men and women. In the commune of Sanankoroba, it is the women's associations that practice this activity, given that the men are for the most part in the neighboring villages and own large areas dedicated to market gardening. As a result, the results obtained are not in line with those obtained by Sani Ali (2019), in the commune of Malbaza in the Tahoua region (Niger), where market gardening is practiced much more by men than by women. In Burkina-Faso too, 25 out of 53 market gardeners are women (Ouédraogo, 2013). This inequality between men and women in market gardening activities can be explained by the fact that in rural areas, women are generally occupied with market gardening activities. However, market gardening remains an activity that contributes to improving the population's living conditions, while ensuring food security. In the commune of Sanankoroba, it also contributes to varying diets and improving household economic conditions (Bognini, 2011).

✓ *Market gardening, a source of income for producers*

In many parts of West Africa, market garden produce is largely destined for the local population. Supplying the population with market garden produce often contributes to social cohesion. In the commune of Malbaza (Tahoua) in Niger, market gardening is the main source of income. This income is used for both family health care and children's schooling. In Ouahigouya (Burkina Faso), income from market gardening is used to create new income-generating activities, acquire capital and manufactured goods, and contribute to food security, health and education (Bognini, 2006).

CONCLUSION

With regard to the characteristics of the respondents, the results of the study show that the market gardeners in the two associations (Benkadi and Dèmèton) are adults and physically fit for market gardening activities. The proportion of women aged 36 and over was 43.8% for the Benkadi association and 37.5% for Dèmèton. Among these market gardeners, 68.8% are married, 53.7% are illiterate and 56.2% practice only market gardening. In addition, 16.7% of the members of the "Benkadi" association have joined their association simply by imitating their comrades who are already in the association.

With regard to working conditions, the results of our surveys revealed that the spaces used by market gardeners are limited. Indeed, the surface areas farmed by 85.2% of the members of the "Benkadi and Dèmèton" associations vary from 1 to 2 hectares, to less than one hectare for 14.8%. The crops grown are okra, yam, potato and eggplant. The members of the two associations are better organized, in order to make decisions concerning market gardening activities. However, the equipment used is rudimentary (rakes, shovel, daba and wheelbarrow) due to insufficient technical and financial resources. Other constraints hamper the development of market gardening. These include lack of fencing, fertilizer and access to production equipment.

Benkadi et Dèmèton" members believe that the state and NGOs must help develop market gardening in order to overcome these constraints. Despite the constraints associated with market gardening, it helps solve many family problems, such as schooling for children, food purchases, health care, and the purchase of equipment and manufactured goods. New activities have also been created thanks to the income generated by market gardening.

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