i. Title of Proposed Research

Commercialization of Grape Value Chain in Barkum, Bunkure LGA, Kano State, Nigeria

ii. Thematic Area

Agriculture and Food Manufacturing

iii. Executive Summary

This proposal seeks funding support of two hundred million naira only (₦200,000,000) for the establishment and commercialization of a grape value chain in Barkum, Bunkure LGA of Kano State, Nigeria. The project covers the cultivation of grapes on 2 hectares of farmland, processing into value-added products (juice, raisins, jam, and vinegar), and market distribution. The initiative aims to improve food security, enhance nutrition, generate employment, and boost agribusiness in Northern Nigeria.

iv. Background of the Institution

The Federal College of Agricultural Produce Technology, Kano is the training arm of the Nigeria Stored Produce Research Institute (NSPRI), a parastatal of the Federal Ministry of Agriculture and Rural Development. The college was saddle with the mandate of training middle level manpower as well as conducting Research on Agricultural produce. The College was established in 2008.

Presently the College operate its academic, training and research activities in three campuses, Hotoro CBN Quarters, Barkum (Bunkure LGA) and Danhassan (Kura LGA) Kano State. It has the 19 Academic Programs in the fields of Agricultural value chain at both National and Higher National Diploma as follows;

a. Crop Production Technology
b. Food Science Technology
c. Agricultural Extension Management

d. Agribusiness Management
e. Post-harvest Technology
f. Produce Inspection Technology
g. Nutrition and Dietetics
h. Pest Management Technology
i. Agricultural Technology
j. Horticultural Technology
k. Animal Health Production Technology
l. Animal Production Technology
m. Cooperative Economics
n. Computer Science
o. Software Development
p. Statistics
q. Networking and Cloud Computing

On the part of practical abilities, the college has the following practical strength;

1. Crop Production for both annual and perennial crops.
2. A complete food processing and packaging plant (tomato paste and gruel).
3. Designed fabricated solar dryers made by the college engineers and technologist
4. Modified fish smoking kiln.
5. Laboratories for food analysis.

v. Background of the Research

Nigeria is heavily dependent on imported fruits and fruit-based products despite having favorable agro-ecological zones for local production. Grapes, in particular, are in high demand for fresh

consumption and processing into wine, juice, raisins, jam, and vinegar. Currently, Nigeria imports over 90% of its grape-based products, leading to high foreign exchange spending. Kano State, with its semi-arid climate, has shown potential for grape production, especially in Bunkure LGA.

A grape is a fruit, botanically a berry of the deciduous woody vines of the flowering plant genus *Vitis*. Grape is one of the nutritious, delicious and refreshing fruit which occupies more than half of the world total fruit production area and ranks first in the global tonnage of fruit production. Grapes are one of the world's most commonly produced fruit crops, with approximately 74.5 million tons produced annually (OIV, 2022). The cultivation of grapes is spread throughout the world with an estimated surface area of 7.3 million hectares in 2022; five countries represent 50 % of the world vine yard which are Spain, China, France, Italy and Turkey (OIV, 2022). Grapes are consumed as both fresh and processed products, such as jam, juice, jelly, grape seed extract, dried grapes, vinegar and grape seed oil. The reason for these varied processed products is due to the extreme perishability of the fruit. Grape has high nutritional value and energy content.

Grapes is a versatile crop that can adapt to different types of climates and a variety of soils. Table grapes typically require a hot and dry climate (i.e. warm days, cool nights) and low humidity (typically Mediterranean climate). Grape is a semiarid subtropical crop which requires warm and dry summer and cool winter. It thrives well in regions with a temperature ranges from 4.5^0 C to 45^0 C. Grapevine is adapted to many types of soils, but are most successfully grown on sandy or fine sandy loams with average fertility and good drainage. On soils with low fertility, grapes grow slowly and produce low yields (Esteban *et al*., 2002). Above all, there must be adequate sunlight to ensure a sufficient supply of carbohydrates which affects characteristics such as maturity degree, sweetness, and coloration of the fruit.

Grapes were introduced to Nigeria in 1965 and was established at Maigana, Daura, Gembu, Biu, Riyom and Panyam by the United State Agency for International Development (USAID). In 1963, the Premier of northern Nigeria visited Morocco and Libya where he found grape and apple being grown on similar soils and climatic conditions as some part of northern Nigeria. Therefore was then introduced in 1965 through USAID (Tappan, 1966).

vi. Statement of the Problem

In 2023, Nigeria imported $8.53Million of Grapes, becoming the 82nd largest importer of Grapes (out of 222) in the world. During the same year, Grapes were the 479th most imported product (out of 1,184) in Nigeria. Nigeria imported grapes primarily from South Africa, China, Egypt Lebanon and Spain (Ahmed *et al*., 2024).

Grapevine was introduced into Nigeria in the 1965 and is mainly grown as own-rooted vines for fresh fruit consumption in the northern guinea savannah ecological zone of the country. However, there is a lack of information on the grapevine cultivars production in Nigeria. Ahmed *et al*. (1982) observed that there were some varieties being grown around Zaria which failed to fruit due to lack of knowledge to make these varieties produce under tropical conditions. Despite the nutritional composition of grape the production level is minimal with high cost of purchase in Nigeria due to the low information about the production guidelines. The most serious problems experienced with grape growing in Nigeria concerns with fertilization, diseases, pest problem and lack of research to identify suitable varieties, inadequate infrastructure like cold storage and transportation, insufficient water and power supply for irrigation, limited access to credit and expertise, and low yields due to poor management practices (Ahmed *et al*., 2024).

vii. Objectives of the Research

The objectives of the proposed study include the following;

1. Development of Grapevine Yard of two hectare capacity at the College Permanent site.

2. Determination of the adaptability potentials of large scale production of grapevine varieties in the Sudan Savannah of Nigeria
3. Development of Processing, Packaging and grape juice manufacturing unit at the College Permanent site.
4. Development of training and learning center of grape production and processing in Nigeria.

viii. Research Questions

The Research Questions that the proposed study would attempt to answer include the following;

1. Will it be possible to produce grape fruit variety in Nigeria?
2. Can grapevine varieties adapt to the different agro-ecological zones of Nigeria?
3. Can the adapted grapevine varieties yield commercial quantities?
4. Will it be possible to package and process grape fruit in Nigeria?
5. Can grape fruit grown in Nigeria be nutritionally beneficial?

ix. Theoretical Framework

In Northern Nigeria, agriculture is the backbone of the economy, with a strong focus on cereal crops and livestock. However, there is growing interest in diversifying agricultural production by introducing high-value horticultural crops such as grapes. Northern Nigeria's semi-arid climate, characterized by hot days and cooler nights, presents a unique environment for grapevine production. With proper management and technical knowledge grapevine cultivation could become a viable agricultural practice in the region, which would ultimately translate into increased revenue to farmers and reduced import of grape fruit into Nigeria.

The proposed project will establish a grape farm on 2 hectares of land, integrate processing facilities, and develop a sustainable value chain to supply local and regional markets. The project aligns with national goals of import substitution, job creation, and agribusiness development.

x. Methodology and Work Plan

Production:

Soil analysis, land preparation and installation of drip irrigation system. Seven different varieties will be planted using Good Agricultural Practice (GAP). Organic fertilizers and integrated pest management (IPM) systems will be used to manage the vine yard. Bower trellis will be used for the grapevine support.

Processing and Value Addition

Mini juice processing facility will be installed (capacity: 2–3 tons/day), with juice extraction and bottling units. Solar-assisted raisin dryers will be required. To dry the grape fruit into raisin. Small-scale fermentation unit for vinegar production (research and pilot scale).

Postharvest and Storage

Cold storage chambers (5–10 MT capacity) for storing fresh fruits. Packaging in food-grade containers.

Training & Capacity Building

i. Farmers' field school demonstrations.
ii. Women cooperative processing clusters.
iii. Agribusiness and entrepreneurship training workshops.

Market Development

- Linkages with supermarkets, hotels, and export channels.
- Branding and certification for quality assurance (NAFDAC, SON).

xi. Expected Outcomes and Impact

a. Establishment of 2 hectares of grapevine yard in Barkum yielding between 2-3 years after establishment.
b. Increased availability of locally produced grape fruit and its products.
c. Employment generation for over one hundred and fifty people directly and indirectly.
d. Strengthened market linkages and agribusiness opportunities.
e. Improved nutrition and food security.

xii. **Commercialization and Sustainability Strategy**

• establish a cooperative for grape growers and processors in Barkum.

• Establish a sustainable Public-Private Partnership (PPP) paradigm.

• Promote goods under the local "Kano Grapes" brand.

• Take advantage of export prospects to ECOWAS nations.

• Create business innovation hub for the development of businesses producing goods derived from grapes.

xiii. Estimated Budget (N200,000,000.00)

Item	Description	Cost (₦)
Land preparation and irrigation	Clearing, drip system, trellis installation	25,000,000
Improved seedlings	5,000 seedlings, transport, planting	10,000,000
Fertilizer, chemicals & inputs	Organic and IPM	8,000,000
Processing facility	Juice line, raisin dryer, fermentation unit	60,000,000
Cold storage and packaging	10 MT cold room, packaging materials	30,000,000
Training and capacity building	200 farmers/women	15,000,000
Labor and farm operations	Field staff & technicians (2 yrs)	12,000,000
Research, monitoring and evaluation	Data collection, extension	10,000,000
Market development and branding	Certification, brand design	10,000,000
Contingency (5%)	Miscellaneous	20,000,000
Total		**200,000,000**