COCOA UNITS

FOR

GRADES 6 - 8

CLASSES IN PAPUA NEW GUINEA SCHOOLS

Cocoa Coconut Institute
Papua New Guinea

Department of Education

First Edition

2013

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Grades 6 - 8 (Upper Primary Classes) in Papua New Guinea Primary Schools

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Mr. Alfred Nongkas was the CCI Industry team leader in the Cocoa Curriculum Project while Mr. Anton Varvaliu provided the administrative support and advice. Mr. Chris Fidelis of CCI provided some graphics and content input while Mr. Godfrid Hannattof NARI Kerevat helped with some graphics. Their contributions are acknowledged.

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Edited by Dr. Arnold C. PARAPI (PhD-Agriculture Education)
Cocoa Curriculum Consultant

Cover Page: Kamanakam Primary School Students in the School Cocoa Plot

CONTENT

MESSAGE FROM THE SECRETARY OF EDUCATION

Cocoa growing is a major cash crop for Papua New Guinea (PNG). It is a crop that earns a lot of foreign currency for the country. As a sustainable and renewable industry, it offers great potential for school leavers to take up cocoa farming as an entrepreneurial activity and live a sustain life in the communities. These are some of the reasons the Education Department is pleased to partner with a major commodity crop sub-sector such as the cocoa industry to develop relevant and appropriate curriculum to impact our school leavers in the rural communities of the country. The Education Department beliefs in integral human development and strengthening the rural population therefore such a relevant curriculum and partnership arrangement with a major commodity crop is encouraged and promoted.

Cocoa is a rural and community based cash crop and the knowledge, skills and attitude of cocoa production, processing and marketing will go a long way in promoting and enhancing community living. This is why cocoa units are approved for use by teachers and schools to teach such subject matter at upper primary classes in the primary school. These cocoa units will be taught as units of Making a Living (MAL) curriculum and it is highly recommended to teachers and schools.

The MAL curriculum for upper primary classes was designed to teach students with the process skills of identifying community based learning opportunities for school leavers linking the community. Therefore the cocoa units to be taught units of MAL are to promote community based teaching and learning.

Through the cocoa units of MAL, the students will learn about the economics of cocoa and its importance to the community and the country. It will teach them about the cultural, social and the economic importance of the crop. The management of the cocoa and generation of income will support life in the communities. One of the new units of cocoa in MAL introduces students of the importance of the crop and this unit is intended to create the motivation needed amongst student to take up cocoa as an entrepreneurial activity to sustain their livelihood in the community.

It is my honor and privilege to commend and approve this Cocoa Units as units of MAL to be taught in the Upper Primary Schools in the lowlands regions of PNG.

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DR. MICHAEL TAPO (EdD)
Secretary for Education

MESSAGE FROM THE CHIEF EXECUTIVE OFFICER, CCI PNG LTD

This cocoa curriculum provides the fundamental knowledge, skills and attitude of cocoa farming for grades 6-8 classes at upper primary level of education in the country. It has been developed by the Cocoa Coconut Institute (CCI) of Papua New Guinea (PNG) in consultation with the National Department of Education. With our major partner, the National Department of Education, we have development this curriculum for the benefit of the future cocoa farmers at an early age of their education. We certainly hope that learning cocoa production, processing and marketing knowledge, skills and attitude will enable them to take up cocoa farming as an entrepreneurial activity when they leave school as school leavers.

Cocoa is major lowland crop and is central to the economic, social, cultural and political fabric of the lowland communities in Papua New Guinea. It is through cash income that is derived from cocoa that contributes to the wealth and status of farmers and communities that grow cocoa as a means of earning cash income. It is for this reason, the cocoa curriculum has been developed so that youth with to gain maximum benefit from growing cocoa.

Like many commodity crops that a dependent on the international demand and supply situation which highly impact cocoa price and the resultant cash the farmer receives, from cocoa farming is a very challenging enterprise. These coca production challenges include: the difficult terrain in which rural farmers live, infrastructural problems prevent efficient marketing, farmer attitude for growing cocoa, competing opportunities in other crops and livestock, cocoa farming has been badly impacted in recent times by the incursion of Cocoa Pod Borer. This has significantly reduced cocoa production in some communities. It is therefore the CCI's duty to consolidate current research and extension programs while engaging new and innovative ways to increase production. One such opportunity to increase and maintain high production is to skills our youth to take cocoa production seriously through formal education and training programs.

An estimated 50, 000 students that leave school each year to go to the communities. It is important to appropriately skills them so that they can have cocoa farming as a better alternative than to engage in anti-social and criminal activities. For these reasons the CCIPNG is keen to assist the school better prepare the youth for life in the villages. I feel strongly that the cocoa curriculum offers great potential to youth to be enterprising and productive members of the community. Therefore with the Education Department's approval, I have much pleasure in recommending cocoa entrepreneurship learning opportunity in schools as a viable alternative to encouraging the students to take up cash income opportunities as the school leavers enter the communities, while in turn helping to our economy grow.

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DR. EREMAS TADE, (PHD)
Acting Chief Executive Officer

INTRODUCTION

The cocoa curriculum is a partnership endeavour between the Cocoa Coconut Institute of Papua New Guinea and the National Department of Education. It follows on from the successful partnership between the Coffee Industry Corporation and the National Department of Education that saw the development and launching of the coffee curriculum in Papua New Guinea.

The Education Department is responsible for curriculum matters in PNG schools but does not have the specialist personnel in all industry based areas to support content input in curriculum development. Therefore, the partnership arrangement between the education sector and the private sector agriculture enables the much needed curriculum content input into the curriculum of school system. This helps to teach our students, many of who will be school leavers, to learn community based production skills to create self-employment and living a productive, yet sustainable livelihood in the communities.

These cocoa units are especially developed for students the upper primary level of education in the country. The content are fundamental coffee knowledge, skills and attitudes that are intended to create interest in the growing, production, processing and marketing of cocoa as a cash crop in the country. Other more advanced units will be taught in the high schools and secondary schools of country.

The first edition of the cocoa curriculum is a trial edition which will be piloted in selected schools in the East New Britain Province after launching. One school each at each level of education will be selected to trial the curriculum. After the trial or field testing of this edition, content and technical editing will be done to include the field experiences to the second edition or the expansion edition to be used in schools of the cocoa growing regions of Papua New Guinea

The Education Department welcomes the much needed subject matter or content support from the Industry such as cocoa for the development of curriculum for our school system. The CCI PNG and Education Department hopes that this intervention by a partnership arrangement will provide the desired impact on our productive population (the youth) and the wider society in the country.

Enjoy learning about cocoa and make learning experiential, meaningful and productive!

RATIONALE

The Making a Living (MAL) aims to make explicit and clear the knowledge, skills, attit and values the students should achieve during and at the end of a desired learn period(s) as they prepare to exit the school system as school leavers after grade 8.

The process skills of MAL and the subject matter to be taught have been developed usi the Outcome Based Education (OBE) approach. The OBE is currently being reviewed directed by the government and if the education system is to revert to the Objecti Based Teaching and Learning approach, a second addition will be produced reflectir the changes.

This Cocoa Teachers Resource book will also be field tested in four selected schools the East New Britain Province. One school for the different levels of Education (i.e Primary, High School, Secondary School and Vocational Centre) will be used for the fiel trail.

The cocoa units for the upper primary classes are developed by the Cocoa Coconu Institute in partnership with the National Department of Education under the school developed strands in MAL. In line with the primary aims of the National Curriculum statements for upper primary classes, the cocoa teacher's resource book will be taught as units of MAL. That means that the cocoa units with will be planned, taught and assessed as a unit of MAL.

The cocoa units to be covered in the cocoa curriculum should lay the strong foundation for further learning of cocoa management, processing and marketing to increase yield and improve the quality of cocoa produced for export. Unit such: the importance of cocoa in the industry, it's origin, its parts, and its functions will be learnt as part of MAL. An important unit in the MAL cocoa curriculum will be the 'motivational unit'. The motivational unit is intended to help create and maintain interest in cocoa production as a viable self-employing and cash driven crop that contributes significantly to the rural economy in the country. Other more advanced units of highly skilled cocoa management practices, processing and marketing will be covered in the secondary cocoa units.

Cocoa is a coastal cash crop. Over 85% of the rural farmers are involved in growing cocoa as a cash crop. This crop provides the only source of cash crop in the remote, isolated and rural area of 14 Provinces in the coastal regions of the country. At the time of writing this curriculum resource book, Bougainville leads the country in cocoa production followed closely by East Sepik and Madang province. It therefore means that cocoa is an important economic crop in the country and students leaving schools and returning to their communities as school leavers must have the skills necessary to grow cocoa and manage it as a business.

The cocoa units:

- Motivate the minds of the young students and introduces them to the important tree crop.
- Develop enthusiasm among students on the cash reward generated to them by farming cocoa as a cash crop

- Introduces the students to the importance of cocoa in the economic, social and cultural lives of the students when they leave school.
- Encourages self–reliance and self-employment through teaching of practical oriented cocoa farming skills.
- Promotes student–centred learning through experiential learning, guided discovery, problem solving and participatory oriented learning approach. This will stimulate the minds of students to become critical thinkers in addressing complex issues when theory reach in higher grades in secondary schools
- Prepares students to be useful, purposeful, productive and enterprising citizens in the communities.

Through studying the cocoa units in MAL, the student:

- Will be actively engaging in practical skills of cocoa that will enable them to develop positive knowledge, attitude and skills essential in making a living curriculum.
- Will gain useful knowledge, skills and attitude to grow cocoa as an entrepreneurial activity.
- Gain positive benefits as student as a school leaver while also promoting good community living knowledge, skills and attitudes.
- Will learn relevant and appropriate knowledge, skills and attitudes development that will be required in improving better lives after school.
- Grow cocoa sustainably and within internationally required environmental practices.

The implementation of the cocoa units will enable schools to:

- Develop cocoa projects that will support the .school learning and improvement program
- Plan and teaching relevant community based curriculum
- Earn internal school revenue from cocoa as an entrepreneurial crop. These money can be used for school curriculum endeavours
- Establish a school cocoa learning laboratory that will be a community resource to benefit the community. The cocoa land lab can be used as a community learning and improvement program.

AIMS

The students:

- Better appreciate the origin, domestication and spread of cocoa as a cash crop Papua New Guinea
- Study the importance of cocoa as an economic and entrepreneurial crop
- Appreciate the importance, value and safe use of cocoa tools and equipment
- Understand the role of cocoa nurseries and manage nurseries within budgets and adhering to environmental requirements
- Be confident technically in new growing cocoa plots and rehabilitating those that need rehabilitating
- Study the external and internal features of the cocoa bean so that they appreciate the importance and value of cocoa bean to exporters
- Appreciate the key steps and major points necessary for the production of high quality cocoa
- Understand and appreciate the economic reasons for selling/buying wet cocoa beans or cocoa dry beans
- Identify the social needs of cocoa as a cash crop and how it impacts the self, the family, the community and the country
- Be aware that within the Cocoa Industry, there is the CCI responsible for cocoa research and the Cocoa Board that it responsible for policy and marketing aspects of cocoa.
- Acknowledge the importance of the Cocoa Board and the Cocoa Research Institute. With that knowledge the school leavers will have the opportunity to seek assistance as and when required

STRANDS, SUB STRANDS, LEARNING OUTCOMES AND INDICATORS

Strand: Managing Resources

Sub-strand	Grade 6	Grade 7	Grade 8
Crop and Animal Management	**6.1.3.** Share an understanding of the economic, cultural, social and nutritional value of crops and animals. They can also compare the benefits of traditional, commercial crops and animal management.	**7.1.3.** Explain appropriate crop management practices and demonstrate these through undertaking a practical cocoa project	**8.1.3** Plan, design and implement a cocoa crop projects relevant to local conditions and resources to be used in generating an income
Indicators	Students will be achieving this outcome when they: • Discuss personal understanding of economics, social, cultural value of the crop in personal, community and national needs. • Identify benefits associated with traditional and commercial crop management • Identify local environment conditions that would influence the choice of cocoa for that area.	Students will be achieving this outcome when they: • Discuss the importance of the crop to achieving sustainable living • Investigate and explain the origin, domestication and spread of the crop • Plot on a map the route of spread of the, center of origin and main centers of production • Identify external parts and the main functions of cocoa crop • Investigate resources, tools and equipment necessary for undertaking a cocoa project production) • Identify and describe a range of appropriate management practices	Students will be achieving this outcome when they, for example • Gather and collate information on the description of the different breeds of cocoa nurseries suited to local conditions • Explain some detail features of roots and shoot systems of the cocoa crop • Develop effective plans and designs • Describe the different procedures involved in cocoa harvesting and processing of cocoa beans. • Undertake appropriate record-keeping associated with a cocoa project • Evaluate effectiveness of the cocoa

		(Describe the main production stages of cocoa in PNG) • Investigate resources necessary for undertaking a cocoa project • Plan and apply skills necessary for managing cocoa and evaluating outcomes of a cocoa project	project and make suggestions for improvements in a similar cocoa project • Reflect on production to check if the cocoa project has achieved its full production potential

STRAND: MANAGING RESOURCES

Sub strand: Crop and animal management

	Grade 6	Grade 7	Grade 8
Learning Outcome	6.1.3. Learn and understand the economic, cultural and nutritional value of crops and animals and compare the benefits of traditional and commercial crops and animal management.	7.1.3. Explain appropriate crop management and animal husbandry practices and demonstrate these through undertaking practical a project	8.1.3 Plan, design and implement a crop or an animal project suited to local conditions and resources aimed at generating an income
Making a Living Process	**Investigate:** Students find out opportunities for growing cocoa and share when they • Observe and ask questions and gather information about cocoa. • Discuss advantages and disadvantages of traditional and commercial cocoa management.	**Make or produce:** Students make or produce when they • Plan and implement a cocoa project • Work individually or cooperatively in groups on a cocoa project • Apply cocoa management techniques successful and increase production	**Plan and design:** Students plan and design when they • Identify specific cocoa project managing local environment and market conditions • Assemble resources needed to undertake a cocoa project • Calculate input costs of a cocoa project • Develop an implementation plan for a cocoa plot **Make or produce**: Students make or produce when they • Apply appropriate cocoa management practices in a cocoa project • Maintain high quality cocoa production • Harvest and process quality cocoa pods and beans

Recommended knowledge	**Economical values of cocoa** • Source of income for individuals, communities and the country **Importance of cocoa to** • Human consumption • Source of income • Social • Cultural value • Trade and export. **Benefits of commercial cocoa** • High yielding varieties & clones • Early growth and maturity • Large commercial and specialty markets • High export potential of the crop.	**Apply appropriate cocoa management practices of** • Land • Nursery techniques and field planting procedures • Cocoa rehabilitation • Pests and disease control	**Importance of planning for coco** Think, plan and … preparation for … reflecting the • Needs of … community • Economic, … and cultural … value of coco… as a cash cr… **Principles of planni… and implementing a cocoa project** **Farm inputs such as** • Labor • Materials and management practices for cocoa trees • Investigate the economic potential of the cocoa project • Plan and design the cocoa project for the household • Estimate time frame and costs involved in the cocoa project • Apply appropriate cocoa management practices • Evaluate the cocoa project and identify ways of improving the project in the future • Rainfall for the cocoa crop • Soil type for

	Compare benefits by • Establishing the benefits of commercial cocoa varieties and clones. • Make informed decisions about which of the cocoa varieties or clones are the most beneficial and appropriate to the community		cocoa production • Humidity • Altitude • Land forms
Recommended skills and suggested activities		**Possible practical activities** • Site and land preparation • Apply correct nursery and field planting techniques • Apply correct weed, pest & disease control methods • Apply environment ally sound management practices	**Application of basic cocoa farming practices** • Good site and land preparation • Apply correct nursery and field planting techniques • Apply environmentally sound crop protection of weeds, pests and disease control procedures

PROJECT UNIT- GRADE 7: ORIGIN, HISTORY AND SPREAD OF COCOA AS A COMMERCIAL CROP

Strand: Managing resources

Sub strand: Crops and animal management

Learning Outcomes

7.1.3 Explain appropriate crop management and animal husbandry practices, and demonstrate these through planning, implementing and evaluating a cocoa project

Purpose

The purpose of this unit is to deal with the fundamental subject matter or production knowledge and skills needed by a new or a prospective cocoa farmer but for a Grade 7 level student. The specific areas considered are the history, origin, spread, uses and the main parts of the cocoa as a cash crop. These knowledge, skills and attitude enable the basic knowledge on cocoa as a prerequisite to upper Primary classes and onto Secondary Schools in PNG.

These cocoa units introduce the student to the origin of cocoa, its domestication and the spread throughout the world. The students will also know about the main external parts and functions of the cocoa crop. These will be dealt with and followed by an overview of the cocoa developed for PNG conditions. At the end, the tools and equipment needed for cocoa farming are learnt.

Unit Content

Knowledge: Students will understand and demonstrate

- Entrepreneurial value of growing cocoa as a major cash crop,
- The origin, history, the early uses of cocoa and the spread of cocoa around the world,
- The introduction of cocoa and the impact of the cocoa industry in PNG,
- Major cocoa growing Provinces and production statistics in PNG,
- Major production issues and benefits of cocoa to PNG farmers and the government,
- The importers and consumers of PNG?
- External parts of the cocoa crop, particularly the roots, the shoot systems and the beans,
- The cocoa production cycle, its operations and reasons for phasing-in cocoa production operations in one calendar year,
- Materials, tools and equipment used in cocoa farming such as;
    - tools and their descriptions,
    - uses of tools and safety precautions,
    - equipment and their descriptions,

Skills: Students will develop the skills to:

- use the world map to trace the route of cocoa origin
- use the PNG to locate major cocoa growing Provinces,
- use basic materials, tools and equipment to grow cocoa successfully,
- care, maintain and storage of cocoa tools, implements and equipment,
- prepare soil for growing cocoa seedlings in the nursery or in the field,
- care and maintain young and field cocoa crops,
- identify external parts of a cocoa crop,

Attitudes: Students will develop some positive attitude such as:

- Good work ethics such as responsibility, honesty, commitment and dedication,
- Care and concern for cocoa crop,
- Pride in their achievements.
- Positive and caring attitude towards cocoa as an business crop

Teaching and Learning Activities

Process skills	Student activities	Assessment task	Materials
Investigation 1 week	• Trace the history of cocoa into PNG • Identify major cocoa growing provinces • List wet bean buyers in the community • List major cocoa dry bean buyers in PNG	Theory Test or story about cocoa in the community	Maps of PNG and the World Handouts
Planning and designing 1 week	• Calculate the number of cocoa seedlings to buy and grow • Determine materials, tools and equipment needed and their costs • Draw a sketch of the cocoa garden • Prepare a cocoa crop diary • Label cocoa tree parts and their functions	Assignment 1:Determine cocoa project input and their costs requirement Produce a plan action	
Implementing 9 weeks	• Calculate the land area needed • Make cocoa nursery • Prepare soil for cocoa nursery using appropriate tools and equipment • Sow cocoa seeds with the correct spacing • Care and maintain young cocoa by weeding, mulching, fertilizing, drainage, shading, pest and disease control	Assignment 2: Cocoa rehabilitation and in-filing the cocoa calendar with cocoa activities Nursery management	Land, Tools, Implements and Equipment Cocoa seedlings
Evaluation 1 week	• Identify problems, issues to correct and strengthen success of the cocoa garden • Look at strategies and options ways of overcoming the problems and issues	Assess the options and plans to correct the operations problems	Use guest or resource persons from CCIPNG and CB, NGIP or Provincial DPI to help assess problems and plans

	• Analyze progress and • Plan to correct problems		

Assignment

Assessment methods	Assessment task	Criteria	Recording method	Comments
Formative Assessment: **Assignments**	Assessment 1: Report or Story by students on the history of cocoa in PNG	Student to present report charts and maps of the World and PNG	Marks awarded and records in class list	Theory based assessment
	Assessment 2: Cocoa Garden Plan for assessment	Group Plan of a cocoa project with farm inputs and costs analysis	Mark the group plan	Group mark
	Assessment 3: Advantages and disadvantages of cocoa rehabilitation and filing the cocoa calendar with cocoa growing activities	Each student will: • Remove all the weeds, • Make drains, • Make drains, using correct depths and widths, • Make fence correctly, • Grow shade trees, • Grow shade trees with correct spacing and recommended shade trees, Carry out correct pruning procedures,	Checklist Class list with set of criteria in the checklist	Individual mark Individual mark (Select skills as appropriate)
Summative Assessment	Assessment 4			

Observation	Nursery management	• Apply organic and inorganic plant foods to the cocoa trees, • Apply correct type and dosage of plant foods to cocoa trees, • Monitor and control frequently coffee pests and diseases,	Class list with set of criteria in the checklist	Individual mark (Select skills as appropriate)
Observation	Basic cocoa rehabilitation activities	• Monitor and control cocoa pests and diseases using recommended controlling agents with correct dosage.	Class list with set of criteria in the checklist	Individual mark (Select skills as appropriate)

PROJECT UNIT- GRADE 8: BASIC COCOA PRODUCTION PRACTICES

Strand: Managing resources

Sub strand: Crops and animal management

Learning Outcomes

8.1.3 Plan, design and implement a crop or animal project suited to local conditions and resources aimed at generating an income

Purpose

This unit looks at foundation knowledge on cocoa management. The topics to study include the types of cocoa nurseries, coffee parts, field management and harvesting and processing. The unit aims to equip students with basic information on the parts and function of a cocoa plant, and simple but essential practices applied in establishing and managing a smallholder cocoa garden, plot or block.

The study on cocoa nursery outlines the different types of nurseries used in germinating and rearing cocoa seedlings while cocoa anatomy looks at the parts and functions of a cocoa tree. The study of morphology is necessary because it introduces and broadens the minds of the students to better understand the functions of the cocoa tree and its parts. The study of anatomy is also necessary for the proper and timely application of cocoa management inputs, such as fertilizer application, pruning operations, shade regulations and pests and diseases control in the field. In the field harvesting and processing, students will learn basic theoretical skills involved in harvesting pods and processing cocoa beans to get good quality dry beans.

Unit Content

Knowledge: Students can:

- Describe the different types of cocoa nurseries,
- Explain the difference between roots and shoot systems of the cocoa crop,
- Outline the procedures involved in establishing cocoa in the field,
- Identify the different procedures involved in harvesting cocoa and drying the cocoa beans.

Skills: Students will develop the skills to:

- Prepare cocoa seed for germination,
- Sow cocoa seeds correctly,
- Transplant cocoa seedlings correctly to polythene bags,
- Name the root types of cocoa correctly,
- Name parts of the cocoa shoot system,
- Prepare land for growing cocoa plants,
- Make proper drainage system for cocoa garden,
- Plant cocoa with correct spacing in the field,
- Manage overgrown seedlings successfully,

- Rotate cocoa plants with food crops,
- Care for the cocoa garden by weeding and mulching,
- Infilling of the dead cocoa seedlings with healthy seedlings in the field,
- Do the basic cocoa rehabilitation,
- Establish cocoa shade trees,
- Carry out cocoa pruning successfully,
- Apply correct cocoa plant fertilizers,
- Harvesting of cocoa pods and beans,
- Processing of cocoa beans.

Attitudes: Students will develop some positive attitudes, for example:

- Good work ethics such as responsibility, honesty, commitment and dedication,
- Care and concern for cocoa as a crop,
- Pride in their achievements.

Teaching and Learning Activities

Process skills weeks	Student activities	Assessment task	Materials
Investigation: Find out opportunities for growing cocoa as a cash crop 1 week **Planning and designing** 2 weeks	• Select appropriate site for cocoa nursery • Discuss reasons for selecting types of cocoa nursery giving their advantages and disadvantages • Show steps in preparing a good polythene bags • Show techniques of transplanting cocoa seedlings into polythene bags • Discuss cocoa as a tree crop • Calculate costs involved in a project and estimate number of cocoa seeds to be used • Identify tools and other materials required and where to obtain these materials • Draw a sketch of the cocoa nurseries • Prepare a basic coffee husbandry/field management diary • Calculate the land area	Prepare a portfolio providing evidence of the following; • Distinguish the types of cocoa nurseries, • Define root and shoot systems, • State main functions of the parts of a cocoa plant, • Identify procedures involved in field coffee establishment, • Outline techniques of harvesting cocoa pods and obtaining good cocoa beans • Describe stages involved processing cocoa beans, • Calculate cocoa specifications.	Basic information on cocoa husbandry

Making or producing 16 weeks	used for the nurseries • Calculate the land area used for field cocoa establishment • Calculate expected harvest in kilograms • Produce a plan of action • Build cocoa seedbeds and polythene tent • Sow seeds in the seedbeds • Place well mixed soil in the polythene bags and sow seeds • Transplant seedlings from seedbed to polythene bags • Clear and prepare the land for field establishment • Make drains • Make proper transplanting holes for cocoa seedlings • Transplant cocoa seedlings in the planting field • Intercropping cocoa with other crops • Mulching • Replacing dead cocoa seedling • Follow basic cocoa rehabilitation program; - Fencing, - Weeding, - Drainage, - Shade, - Pruning, - pests and disease control, - nutrition. • Record cocoa garden activities that has taken place above • Harvest cocoa pods • Process cocoa beans • Keep accurate records • Identify success or problems of the basic cocoa husbandry practices • Suggest ways of overcoming the identified problems • Analyze all the information and make	Seedbed construction Polythene tent construction Growing cocoa seedlings in the polythene bags Preparing a good polythene bag mixture Land clearing and preparation for field cocoa establishment; • Method of clearing, • Drainage, • Field transplanting. Intercropping coffee with other crops like coconut Basic cocoa rehabilitation procedures	Land, raw materials, garden tools, polythene bags, Cocoa seeds Harvesting and processing materials, tools and equipment

Evaluation 1 week	recommendations	Correct harvesting and processing techniques

ASSESSMENT

Assessment methods	Assessment task	Criteria	Recording method	Comments
Formative Assessment **Assignment**	Portfolio	Each student will prepare a portfolio and keep journals providing evidence of the following; • Distinguish the types of cocoa nurseries, • Define root and shoot systems, • State main functions of the parts of a cocoa plant, • Identify procedures involved in field cocoa establishment, • Outline techniques of harvesting cocoa pods, • Describe stages involved in processing cocoa beans • Calculate cocoa specifications.	Checklist with set of criteria	
Summative Assessment **Theory test**	Demonstrate knowledge on types of cocoa nurseries, root and shoot systems of cocoa and their functions	Each student will: • List and explain types of coco nurseries, • Define the root and shoot systems, • List main cocoa plant parts, • Describe the functions of the main parts of the cocoa plant, • Explain the procedures involved in establishing cocoa in the field, • Outline the stages of the cocoa harvesting and	Checklist with set of criteria	

Summative Assessments		processing line.	
Observation	Seedbed construction	Each student will: • Make 3 types of cocoa nurseries, • Build a shade cloth tent for cocoa seedlings.	Class list with the criteria
Observation	Growing cocoa seedlings in the polythene bags	Each student will: • Prepare a good poly bag soil mixture, • Grow cocoa seedlings in the polythene bags.	Class list with the criteria
Observation	Land clearing and preparation for field cocoa establishment	Each student will: • Follow a correct land preparation method, • Make proper drainage for cocoa garden. • Transplant cocoa seedlings following correct transplanting techniques in the field.	Class list with the criteria
Observation	Intercropping cocoa with crops coconut	Each student will: • Grow recommended food crops among the coffee plants.	Class list with the criteria
Observation	Basic cocoa rehabilitation procedures	Each student will: • Use basic cocoa rehabilitation procedures in managing a cocoa garden.	Class list with the criteria
Observation	Correct harvesting and processing techniques	Each student will: • Harvest and process cocoa	

		beans using approved techniques.		

ASSESSMENT AND REPORTING

Assessment

Assessments in *Making a Living - Cocoa Units*, Formative and summative assessme
are to be used as shown and discussed in the context to follow.

Formative assessments are assessments used for learning purposes. Teachers can u
these as guide to measure students' learning of knowledge and skills on coco
production, processing and marketing. This can and will include preparation of studen
for the summative (final) assessments. As part of formative assessments student pe
assessment can also be used. Group assessment should also be used to test gro
dynamic and group work. Teachers should teach via project method and using th
entrepreneurial approach where student experience cocoa production with the view t
achieving high performance amongst students.

Summative assessments are assessments of teaching and learning, used at the end of
sub-unit or a topic to assess the overall student performance at the end of the projec
Decide when to do the final theory tests/exam and assess the final cocoa learning
experiences. High percentages of students' marks should come from the cocoa project
practical learning experiences (about 80%) and only a small percentage (about 20%) is
derived from theoretical learning outcomes. The total *MAL* subject marks should come
from a combination of theory and practical marks of cocoa units and other MAL subjects.

Teachers must ensure that they refer to assessment guidelines in the *MAL* syllabus fo
each grade shown in *Cocoa Teaching Resource Book for Upper Primary Teachers in the
Schools.*

Reporting

Teachers must also make sure that the MAL cocoa units are taught and assessed
consistent with the recommendations for teaching and assessment of student
performances. Teachers must assess student performance of practical physically in the
field and as recommended in Making a Living-Cocoa Units.

Both theory and practical assessment must be administered and recorded correctly.
Achievement standard of each student toward their final grading for Making a Living
subject must be an accurate reflection of each student performance.

Schools are allowed to decide on how reports prepared and given to students. The Cocoa
Research Institute of Papua New Guinea recommends that a Cocoa Certificate is
awarded together with the Basic Education Certificate at the end of Grade 8. The cocoa
learning certificate (when issued to student) can be used to demonstrate that cocoa units
have been learnt while in upper primary classes.

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Cocoa as an Entrepreneurial Activity

Cocoa is an important cash crop for the coastal many rural, remote and isolated villages and communities in the country. Together with coffee these two commodity crops provide for a cash income for about 85 percent of the people in the country. As such the cocoa crop is an important economic lifeline for our rural people.

Cocoa has been and will be a major source of income for many communities. However in the last five years, the invasion of the cocoa pod borer (CPB) has devastated the cocoa industry in Papua New Guinea (PNG). The East New Britain Province (ENBP) was producing about 23, 000 tons of cocoa in 2005 for export until after the CPB invasion which has reduced cocoa production to a mere 7, 000 tons in 2012. The reduced production means a low cash income therefore many farmers have departed from cocoa for other cash income earning opportunities.

Other Provinces where the CPB incursion has been low, cocoa production has gone up. Bougainville, East Sepik Province, Madang and Morobe Provinces have increased production dramatically and they are now the leading producers. Efforts are being made by the CCI and the Cocoa Board along with other stakeholders to contain the spread and impact of the devastating pests. Admittedly though, cocoa remains a major player in the social, economic and the political fibre of the communities in Papua New Guinea. It is for these reasons among others that the cocoa units for MAL and Agriculture in secondary schools have been conceived so that this important cash crop is sustained to remain a major contributor to the lives of our rural population.

As should be appreciated, cocoa together with coffee touch many communities in the rural areas where 85% of our people live. Cocoa is a lowland crop and is a major contributor to the social, economic and cultural activities of the coastal communities. It is therefore important to teach and prepare the youth to consider cocoa as an entrepreneurial crop in the communities and each household can potentially benefit enormously if they are to take up cocoa as an entrepreneurial crop. When all things are considered, the cocoa curriculum at grades 6-8, offers great potential to prepare our youth for life after school. Cocoa as a cash crop when school leavers are well prepared to return to the communities with cocoa skills, it can help the youth become purposeful and productive citizens of our country.



Cocoa Caring and Management in the field
(Photos: Arnold C. PARAPI & Sebastian VUARI)

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