

***Learning from Sanambele:
Role of Food Insects in
Village Nutritional Health***

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***The Quiet Revolution* and our New Paradigm, Bottom-up Philosophy**

Experiential, holistic, participatory, site-focus

THE QUIET REVOLUTION!
THANK YOU TO OUR SPONSOR:



USDA National Institute of Food and
Agriculture (NIFA) Higher Education
Challenge Grant Program

***Montana State University-
Bozeman***

***PSPP 465R Health, Poverty,
Agriculture: Concepts and Action
Research***

BIOL 106CS

Issues of Insects and Human Societies



Land Grant Universities:

Virginia Tech

University of California-Davis

University of California-

Riverside

Montana State University

Non-Land Grant

Service-Based, Private, Urban:

University of St. Thomas

St. Paul MN

Public, not service-based:

University of Montana

Tribal College 1994 Land Grant : Chief Dull Knife College College of the Northern Cheyenne People



Dull Knife



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Underlying Philosophy of The Quiet Revolution

Part 1

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Underlying Philosophy of The Quiet Revolution

Part 2

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Underlying Philosophy of The Quiet Revolution

Part 3

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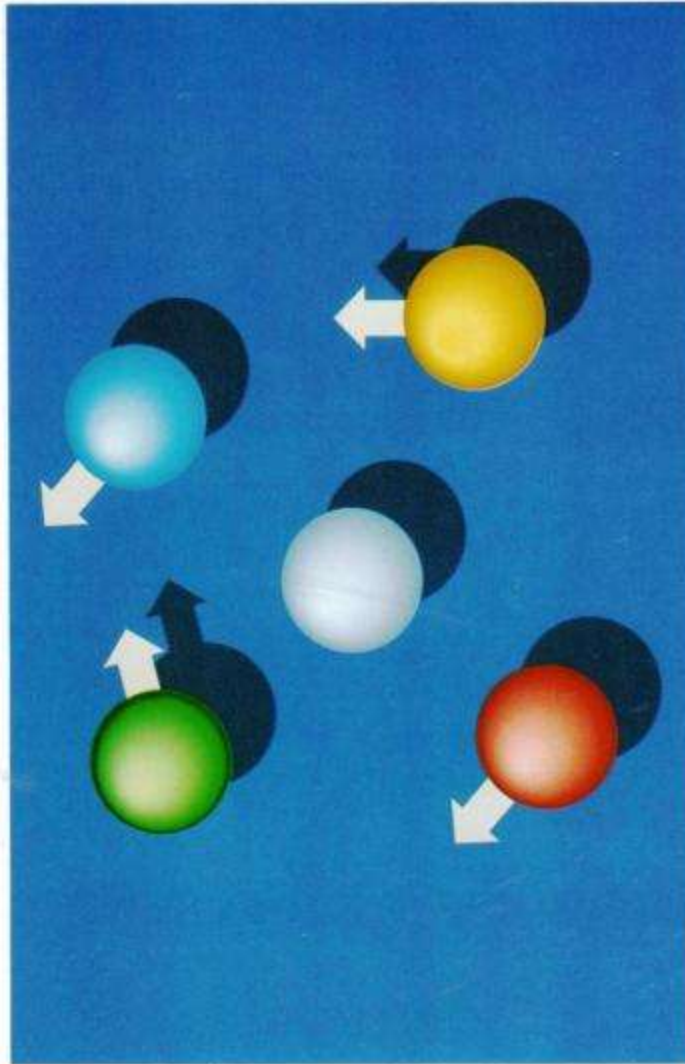


Plate 1. Although they have considerable knowledge of green, yellow, red, and blue, people in single, isolated disciplines are unable to manage gray (the "whole") of which they have no knowledge. Management is not even focused on gray, as the arrows indicate. This single-discipline approach to management was generally recognized as a failure many years ago.

Savory and
Butterfield 1999

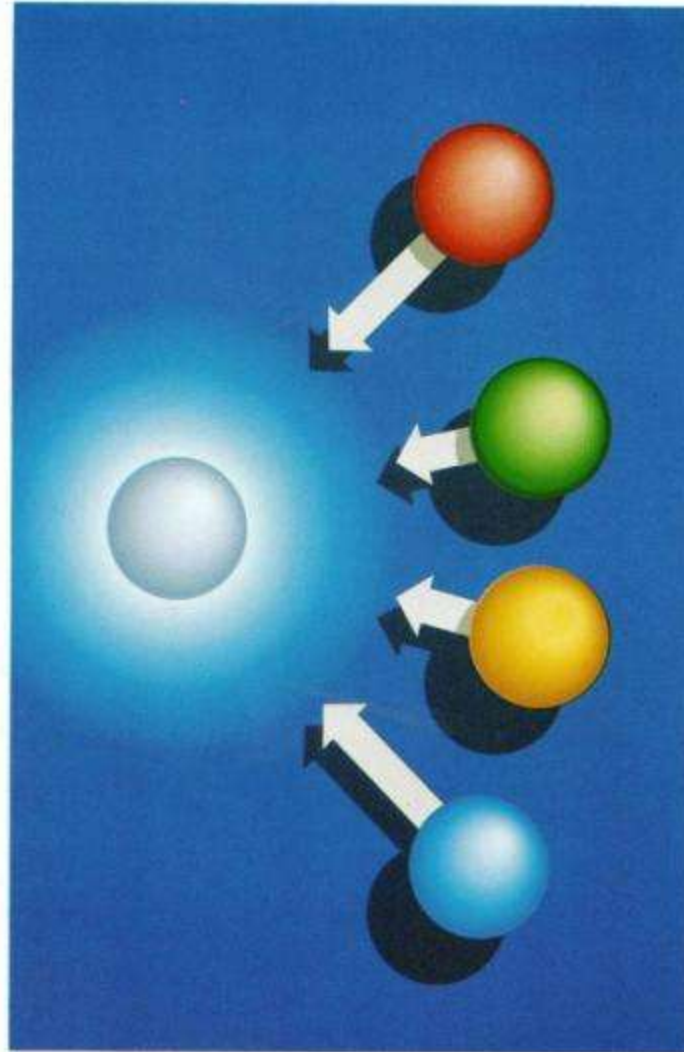
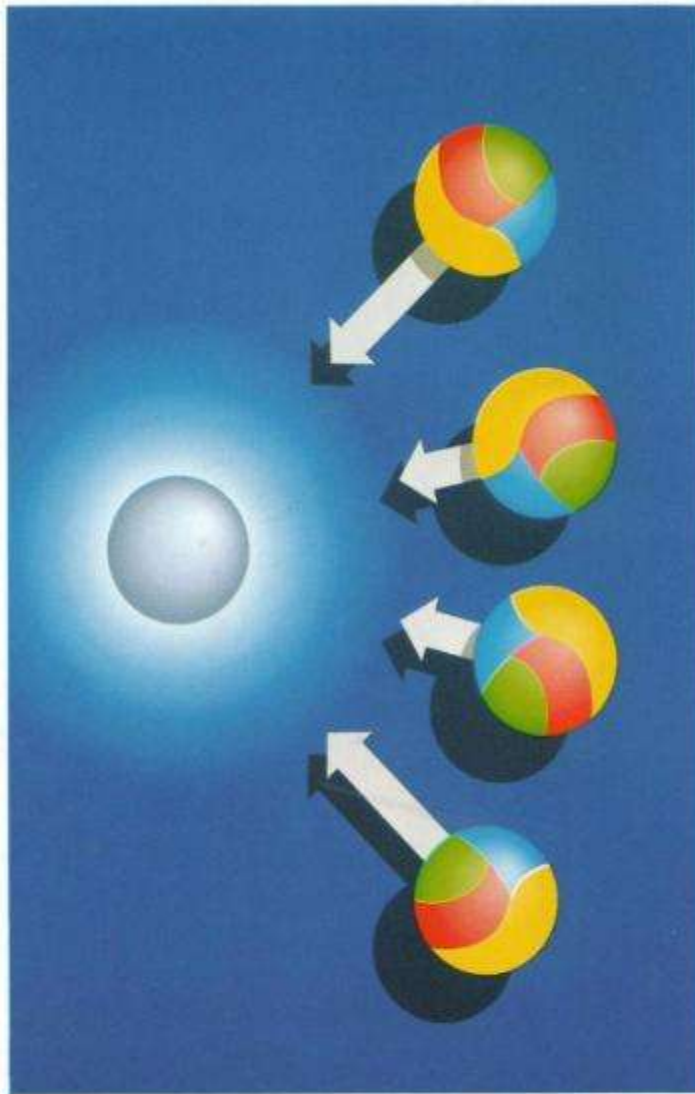


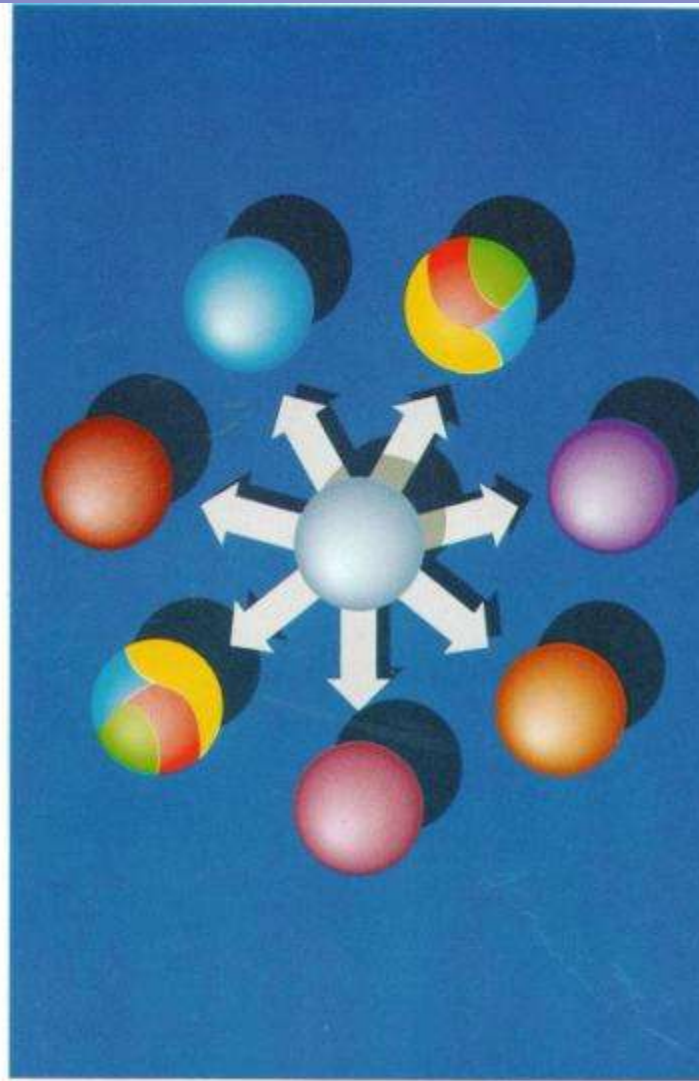
Plate 2. *People in a multidisciplinary team are focusing on gray from their perspective, as arrows indicate, but still with no knowledge of gray. The lack of success arising from multidisciplinary management was attributed to poor communication owing to the jargon associated with the various disciplines, rather than a lack of knowledge.*

Savory and
Butterfield 1999



Savory and
Butterfield 1999

Plate 3. *To overcome communication problems, people trained in several disciplines form interdisciplinary teams that then focus their attention on gray, as the arrows indicate. Knowledge of gray is still lacking, however. The lack of success arising from the interdisciplinary approach to management has only recently been acknowledged.*



Savory and
Butterfield 1999

Plate 4. *We now take the perspective of the whole (gray), first of all by defining the limit of a "manageable" whole, then determining what that whole must become based on the needs of the people within it and the environment that must sustain their endeavors (the holistic goal). Now the people making decisions within the whole can look outwardly at all available knowledge to determine which best serves their needs and takes them toward the holistic goal.*

WELCOME TO SANAMBELE

Traditional Bambara
village in Mali



Location:

2 hours by car or motor bike from the capital
city, Bamako

9 hours by public bus

Population:

1999 - 732 people

2005 – 1,000 people

2010 - 1,200 people

History

- 1999 IPM CRSP participatory IPM vegetable growing project for export
- 2005 Montana State University students / faculty / mentors from Mali national agricultural research organization conduct gender-based focus groups in 11 villages in region, including Sanambebe
- 2005 Samambebe identified holistic goals as a village: #1 malaria eradication, #2 hunger

Malaria History

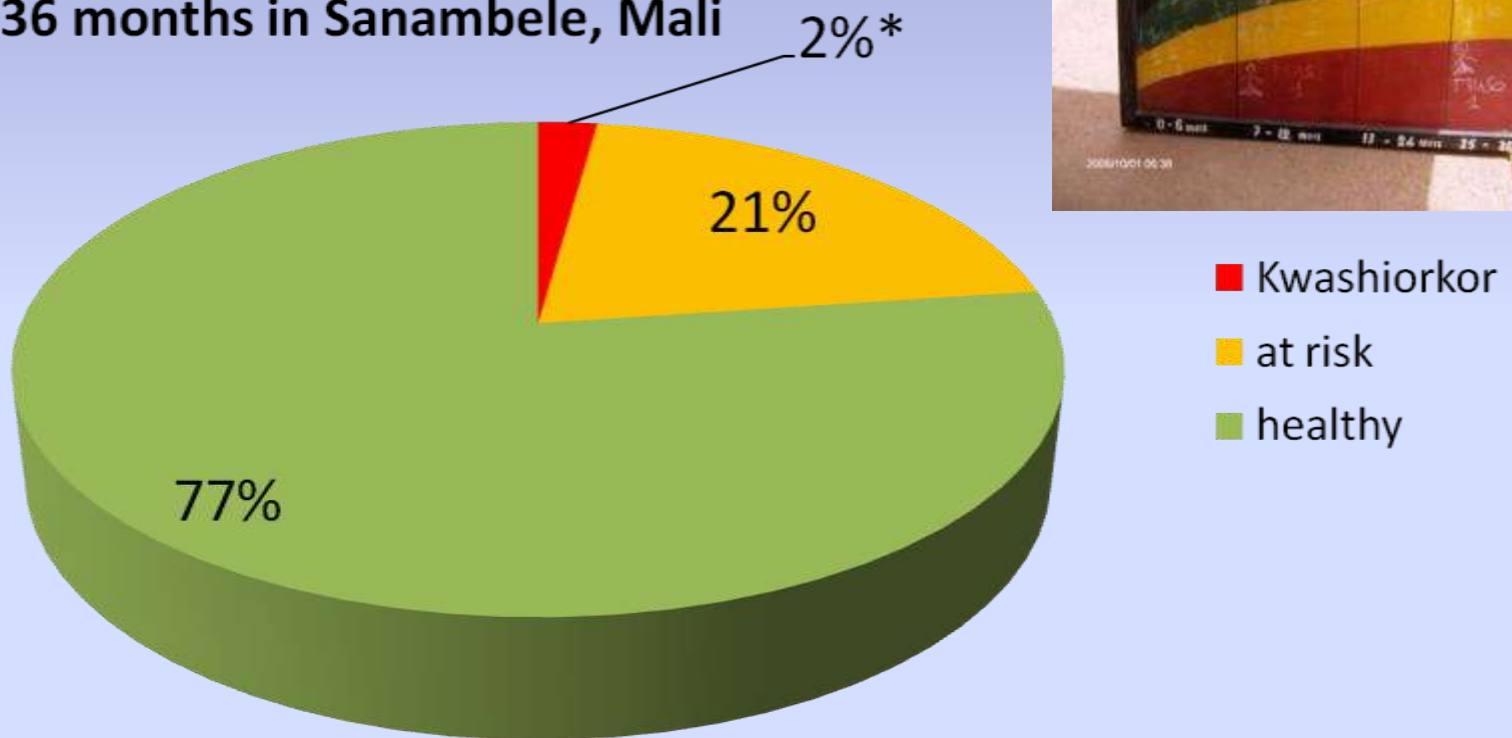
- 2007-2008 villagers develop sustainable, village-based malaria IPM (eradication) plan with suggestions from PSPP 465R students/mentors
- 2009 first year no child dies from malaria and mosquitoes disappear from village in rainy season.
- 2010 Village leaders make plans to help neighbor village develop malaria IPM

“Hunger” History

- 2008 23% of young children, 0 to 36 month old with Kwashiorkor or in risk category
- 2008 Village women/village midwife develop recovery diet for children at risk
- 2008-2009 Montana State PSPP 465R students and mentors learn about diet and kwashiorkor

2008 Kwashiorkor History

Health Statistics of children ages
0-36 months in Sanambele, Mali



*These cases recovered. No deaths due to Kwashiorkor in 2009

μουμε
peselen
AUGUTI
NEGE
Bileman

14-14-25

99 MU CE
43 43

71 = 77
13 = 219
2 = 27



0 - 6 mois

7 - 12 mois

13 - 24 mois

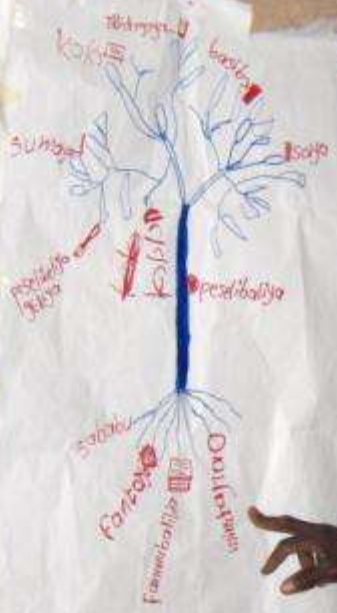
25 - 36 mois

2009 Kwashiorkor history

- March Sanambele Women's Association President initiates classes for moms to learn-to-read through nutrition lessons.
- March Women learn to recognize kwashiorkor and make intervention diet for at-risk children
- Sept women discourage children's grasshopper hunting and eating due to pesticides in nearby cotton fields
- Sept students and mentors introduce brick wall concept of complete proteins



Jabri
 Konobali
 kase mnyama
 suafilantuna soso koro
 sunanjo kase mnyama
 wuluwulu jige ser deke
 maricongo rawet barigese
 se so kafeka jama
 kanya sabati
 wamaw lafana kaseba
 afe wosa kanya
 ni dugukoro



Jabri - karamantoli pason
 kalo 3 falo
 kalo 6 filanin
 kalo 8 no
 kalo 9 no
 kerey sabati bilidde hoso
 den da cogadin kasefakoro fene

nenen Peaurusa katabe gasi dugu
 katanje dugu
 to. t. k. d.
 gu ge 3
 gu daga daga
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 lian dabi



2010 Kwashiorkor History

- No deaths from Kwashiorkor
- Some children recovered from at-risk status



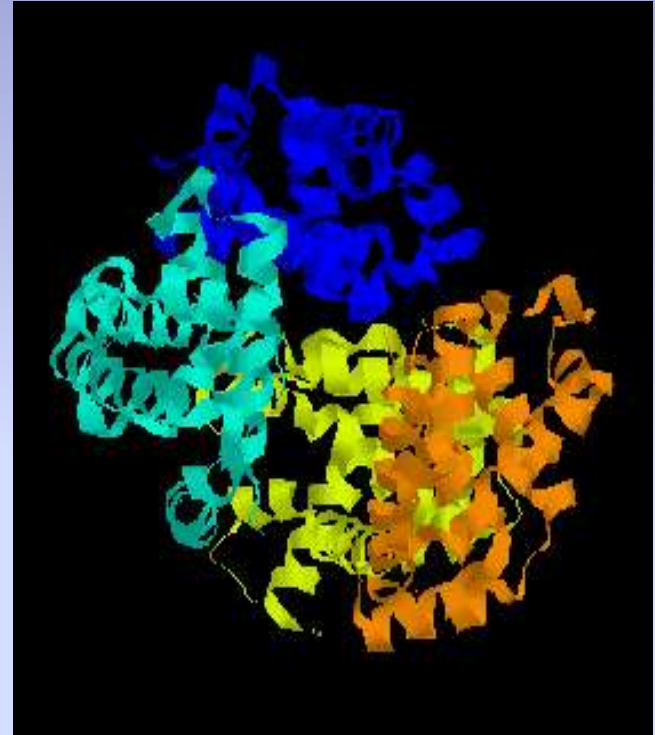


Understanding Kwashiorkor

Complete Proteins, Essential Amino
Acids, and Protein-Energy
Malnutrition

What Are Proteins?

- Class of nutrients required by all living things.
- Pivotal role in many life processes
 - Structural component of cells
 - Component of enzymes and hormones
 - Aid in transport of many chemical compounds within the body
- Constructed of “building blocks” called amino acids



Two Classes of Amino Acids

- Nonessential
 - Body can manufacture
 - Need not be present in the diet
- Essential
 - Body cannot manufacture in sufficient quantities
 - Must be present in the diet
 - Ratios important!

Essential Amino Acids for Children

Arginine

Histidine

Isoleucine

Leucine

Lysine

Methionine

Phenylalanine

Threonine

Tryptophan

Valine

Complete Protein

- Contains all of the essential amino acids
 - Animal products
 - Some nuts
 - NOT MILLET
 - NOT SORGHUM
 - NOT CORN

(Cowpeas contain all essential amino acids, except tryptophane.)



Kwashiorkor

- Form of protein-energy malnutrition
- Results from diet sufficiently high in calories but low in high-quality protein
- Can occur in children of all ages
- Most commonly appears shortly after weaning
- March 2009: Farmers of Sanambebe identify Kwashiorkor as a major problem facing their village

Consequences of Kwashiorkor



- Distended abdomen
- Edema in the hands, feet, and face
- Delayed mental and physical development
- Reddening of the hair
- Irritability
- Listlessness
- Loss of appetite
- Can be fatal!

In Sanambele:
Traditional Adult foods
Traditional Children's foods





Nutritional Facts

Kwashiorkor (Diet is deficient in complete proteins: need meat, eggs, and dairy)
Can cause permanent damage

Malian Diet consists of:
millet, sorghum, rice, corn, tomatoes,
carrots, peanuts, and cowpeas:
**Incomplete source of
essential proteins**



Complementary / Complete Protein Sources



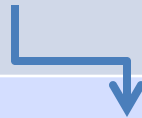
Cowpeas
peanuts
chicken and entrails
wild caught birds
wild caught fish
wild caught frogs
goat meat
goat milk
cow meat
cow milk
sheep meat
grasshoppers
termites
giant water bugs



Nutritional aspect

- Young children (5-10 years old) need ~1g protein/kg bodyweight/day → 19-34 grams protein

	Average Weight of insect	Protein content per 100 grams of weight	Protein content per insect (average)	Number of grasshoppers to be consumed to make up 10% of diet	
				5 year old	10 year old
male	0.313 grams	~20.6grams	0.1376g	27 or	48 Or
female	0.688 grams	~20.6 grams	0.07g	13	24



Compared to ~29 grams per 100 grams of lean beef



© Reuters

- *Oedaleus senegalensis*



- *Kraussaria angulifera*



Grasshopper are supplemental snacks for young children

Western Attitude

REJECTED

- Risk of pesticides should be assessed
- Risk of losing cultural richness
- Reassess holistic goals to identify current issues



Recommendations

- Listen
- Respect and recognize value in traditional wisdom
- Encourage holistic goal setting
- Be an example of ethnorelativism



Acknowledgements



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T H A N K Y O U !



Questions?

