FACULTY OF BIOSCIENCE ENGINEERING

ANAEMIA AMONG PREGNANT WOMEN IN BURKINA FASO

Course: Community Health Promotion

Professor: Maïté Verloigne

Tutor: Sarah Devos

Group members

Adissa Ouedraogo

Esther Chawanda

Irene Muhoracyeye Nziz

Jinmei Wei

Najma Shirwa

UNIVERSITEIT GENT

STEP 1: NEEDS ASSESSMENT

1.1 ESTABLISHING A PLANNING GROUP

INTRODUCTION

Maternal anaemia remains an acute problem in public health worldwide because of its magnitude and negative results. Although maternal anaemia is common throughout the world, it is especially prevalent in low and middle incomes countries. According to the World Health Organization, maternal anaemia affects 57.1% of pregnant women in Africa, classifying anaemia during pregnancy as a serious public health issue (Meda et al., 2016a). It has been well-established that anaemia has substantial negative effects on the health and economic well-being of nations and communities. Maternal anaemia increases the risk of pre-term delivery and low birth weight, and iron-deficiency anaemia, anaemia underlies 115,000 maternal deaths and 591,000 perinatal deaths each year (Usaid & Spring, 2021).

Sub-Saharan countries experience a high prevalence of anaemia in pregnancy, where 39% of women of reproductive age and 46% of pregnant women are anaemic (Mruts et al., 2022). In 2019, data collected by the health data organization exhibited that iron deficiency caused maternal and neonatal disorders causing 490.59 deaths (0.53% of the total death). Iron and folic acid (IFA) deficiency are considered the primary cause of anaemia, but the influence varies among population groups and geographical regions. The main risk factors contributing to iron deficiency anaemia include a low intake of iron, poor absorption of iron from diets, and a period of life when the iron requirement is higher than normal, like growth and pregnancy. Other contributors to anaemia are acute blood loss, severe and chronic infections (particularly HIV and Helicobacter pylori), micronutrient deficiencies, such as vitamin B deficiency, and haemoglobinopathies. (Ilboudo, Traoré, Méda, Hien, Kinda, Dramaix-Wilmet, Blaise, et al., 2021).

According to Global Nutrition Report, Burkina Faso is reported to be one of the countries still struggling with achieving the global targets regarding maternal, infant, and young child nutrition (MIYCN) (WHO, 2019). As a low-income country, Burkina Faso is among the countries with a high prevalence of anaemia due mainly poverty and food shortage (Meda et al., 2016b).

TABLE 1. PLANNING GROUP OF INTERVENTION

Planning Group	Justification	Responsibility
Women of reproductive age	Beneficiary	-Active involvement in the intervention - Offering feedback
Community leader	Primary actors	- Social influence and mobilizations -Provide information and assurance to the community. -Facilitate problem solving and decision-making process -Gives permission to continue with the study and interventions.
Community health workers	Primary actors	-linkage between target group and program designer - share current community health need -Implementation -follow up
Trained enumerators	Data collector	-Leading focus groups and knowledge evaluation. - Participate in the baseline survey and follow-up session
Economist	Expert	- Provide financial education -Project support measures (to insure a regular follow-up and evaluation) -Develop teaching curriculum for the financial education

Nutritionist	Expert	- Provide nutritional and health educational advice -Regular check-up of effectiveness
Ministry of health	In charge of health-related interventions in the country	-Define health intervention guidelines. -Offer approval for the intervention.
Ministry of finance and commerce	In charge of micro-finances	-Provide financial support for activities -Monitoring and ensure the effectiveness of the intervention
NGOs	Partners for the program	- Share experience and information to provide collaborative and technical support

All the stakeholders involved in the anaemia intervention case of Burkina Faso, and their responsibilities are presented in the table above.

1.2. QUALITY OF LIFE

Maternal anaemia results in increased risk for maternal and child morbidity and mortality, high puerperal infection rates, and more low-birth-weight babies. Severe anaemia has a relation to premature deliveries, caesarean sections, prolonged labor, and preterm delivery (Meda et al., 2016a). The primary concern about the adverse effects of anaemia on pregnant women is that this population is thought to be more vulnerable to perinatal mortality and morbidity (Allen, 2000). Maternal anaemia also increases the mother's risk of dying during and after childbirth. Severe anaemia can cause circulatory decompensation, increased cardiac output, an increased

risk of haemorrhage, and a decreased ability to tolerate blood loss, all of which can result in circulatory shock and death (Young, 2018).

Furthermore, the consequences of anaemia during pregnancy affect not only the mothers, but also their children, including increased risks of low birthweight, preterm birth, perinatal mortality, and neonatal mortality (Young, 2018). Iron deficiency anaemia may have an indirect negative impact on infant development. Children diagnosed with iron deficiency in infancy performed poorly on measures of mental capacity, motor development, and socio-emotional functioning when tested at ages ranging from preschool to adolescence (Lozoff et al., 2006) During a child's development, there may be an effect on language development, behavioural effects, and decreased physical activity (Amegbor et al., 2022).

Women play an important economic role in society because of their effects on the workforce, household, and community levels. As a result, anaemia during pregnancy can significantly reduce physical work and earning capacity (World Health Organization, 2015). Clinically, the treatment of anaemia requires a wide implication of health workers, therefore the health sector represents a major actor. Two main treatments are known: iron supplements and blood transfusion which have proven their efficacity. In addition, the risk and cost–benefit profile needs to be considered in selecting iron treatments. Blood transfusions are associated with high costs and a limited resource, whereas oral iron treatments are in good supply and are the least expensive of all iron therapies; however, they require repeated administration and cannot be easily monitored.

1.3. THE HEALTH PROBLEM

Anaemia is defined by the World Health Organization (WHO) as a low haemoglobin concentration or haematocrit, with haemoglobin (Hb) levels of 12.0 g/dL in women and 13.0 g/dL in men. It is more common in women than in men (Domenica Cappellini & Motta, 2015). Iron deficiency anaemia (IDA) remains the leading cause of anaemia worldwide, and it has a significant impact on the lives of young children and premenopausal women in both low-income and developed countries ((Camaschella, 2015) Iron deficiency anaemia is due to lack of mobilizable iron stores with a compromised supply of iron to tissues. It is estimated that one third of women of child-bearing age are anaemic, of whom half is has a result of menstruation and poor diets (Brabin et al., 2020).

Women and young children are particularly at risk because of their higher needs for vitamins and minerals for pregnancy, lactation or growth and they may suffer consequences such as higher frequency of illness and impairment of physical and mental development. The main

causes of anaemia in pregnancy in Africa are nutritional deficiencies (especially iron and folic acid), haemorrhage during pregnancy, haemoglobinopathies, malaria intestinal helminthiasis, HIV and Helicobacter pylori infections (Lassi et al., 2017).

In Burkina Faso, maternal deaths and feto-infant mortality are among the highest in the world. According to the DHS (Demographic Health Survey), the prevalence of anaemia was 88% among 6 to 59 months old children and 49% among 15 to 49 years old. The prevalence of anaemia in pregnant women in Burkina Faso is 58% regardless of the implementation of recommended preventative strategies. it is estimated that around 40- 50% of anaemia is linked to iron deficiency, globally, but this proportion can vary greatly on the prevalence of other factors such as malaria, intestinal parasites, and deficiency in vitamin B12 or B9 (Ilboudo, Traoré, Méda, Hien, Kinda, Dramaix-Wilmet, Savadogo, et al., 2021). According to DHS (Demographic Health Survey) (2018), anaemia prevalence varies by region, with the highest prevalence observed in the Centre-Ouest region, where 68% of women aged 15-49 years are anaemic. The Centre-Nord, Centre-Est, and Est regions also have high prevalence rates, ranging from 62% to 65%. The survey also indicates that anaemia prevalence is higher among rural populations than urban populations.

During pregnancy, anaemia is an important consequence of malaria infection and in Burkina Faso the intensity of malaria varies according to the season. This seasonal peak is variable across the three major geographic zones linked with the duration of the rainy season: up to three months in the north, six months in the centre and nine in the south of the country. The western part of Burkina Faso has higher rainfall than the rest of the country. Its environmental parameters offer optimal conditions for the development and persistence of malaria, which contribute to high prevalence of anaemia in this region (Millogo et al., 2022).

THE BEHAVIOURAL AND ENVIRONMENTAL FACTORS

There are limited data sources for Burkina Faso. Thus, data from Burkina Faso and sub-Saharan Africa were combined to infer the factors and determinants of pregnancy anaemia in Burkina Faso.

BEHAVIOUR FACTOR

Several research had investigated the various factors that cause anaemia in pregnancy. Maternal age, residence, literacy, antenatal care visit, inter-pregnancy interval, iron food consumption, dietary practice and habits, micronutrient intake, dietary diversity, iron supplementation, parasite infection, and gravidity were identified as independent predictors of developing anaemia in pregnancy (Fite et al., 2021). Good dietary habits during pregnancy are important in determining both the mother's and the unborn baby's long-term nutritional status. According to studies, dietary inadequacy due to dietary habits and patterns is higher

during pregnancy than at any other stage of life (Gibore et al., 2020). Poor dietary habits in any given population are frequently the result of socioeconomic challenges and a lack of nutritional knowledge. The proportion of people living in poor households in Sub-Saharan Africa is significantly higher than in other parts of the world (Amegbor et al., 2022). Because of individual and household poverty, most of the population in this region has difficulty accessing proper nutrition, contributing to Sub-Saharan Africa's high anaemia burden ((Amegbor et al., 2022).

ENVIRONMENTAL FACTORS

- **Household environment**

Several household factors ranging from food security to economic status of the household have been identified to have a link with the development of anaemia especially in the vulnerable population (pregnant women and children under-five) (Moradi et al., 2018). According to a review of the literature on food insecurity and anaemia, there is an increasing interest in food insecurity and macronutrient insufficiency issues (especially anaemia) in the context of mothers and baby health. Food insecurity and anaemia have been proven to have a greater impact on women of reproductive age, particularly expecting moms, due to their higher need for micronutrients (Ghose et al., 2016). This relates to the gender dimensions of food security, as well as the impact of women's socioeconomic vulnerability on their lack of control over their nutritional and other health problems. According to household dietary surveys, male members consume more calories and nutritious meals and use health care services more frequently than female members (Ghose et al., 2016).

Furthermore, pregnant women from lower socioeconomic groups are more likely to develop anaemia than those from higher socioeconomic classes. This is because income is closely related to economic status. Lack of family income leads to fewer daily food purchases, which reduces the quantity and quality of mother's food per day, thereby lowering nutritional status. Which occurs in case of a low-income population as they have difficulties accessing rich food in Iron ((Noviyanti et al., 2019).Additionally, Poverty and income inequality have a direct impact on the two main pillars of food security: accessibility and availability, and their individual or combined effects are likely to create challenging compromises between food and other household and personal necessities, setting the stage for food vulnerability and increased susceptibility to micronutrient deficiency diseases(Ghose et al., 2016).

- **Community environment**

Feeding traditions varies from one culture to another and from one society to society. Consumption habits are an element of any culture in a community and are linked to

traditions, beliefs, and taboos. Every society, whether traditional or modern, has both helpful and detrimental feeding practices. Food habits and dietary prejudice disproportionately harm women and children (Biza Zepro, 2015).Various researchers observed that many women in developing countries restrict their food intake during pregnancy for a variety of reasons, which can be attributed to either cultural inspired food prohibitions, food modification related to pregnancy, the desire to have smaller infants because smaller infants have a lower risk of delivery complications, and the perceived severity of delivery complications because large babies make delivery difficult (Nana & Zema, 2018). As a result, food taboos and restrictions during pregnancy place pregnant women at a significant risk of maternal death, low body weight, iron deficiency, and anaemia, which is frequent among mothers in impoverished countries (Biza Zepro, 2015).

- **Societal environment**

Burkina Faso is in the initial stages of demographic transition. The main urban area is represented by the capital city of Ouagadougou and its surroundings. Changes in lifestyle and dietary habits typical of urbanized populations have already occurred here (Casari et al., 2022). This shift reflects socioeconomic changes as well as a shift away from subsistence farming and toward more occupation jobs. As a result, the diet shifts from traditional to Modern with high-caloric and processed food (Casari et al., 2022). Inadequate micronutrient intake in food insecure households can be caused by either under-consumption of food or overconsumption of energy-dense but nutrient-poor diets, which are becoming increasingly affordable sources of calories for poor consumers (Ghose et al., 2016).

Food consumption varies depending on the location you are in. Most studies in Burkina Faso have observed a food system difference between rural and urban areas, with urban areas differing from rural areas in food habits, culinary practices, and food supply. New easy-to-prepare and processed foods appear on a regular basis in the city, and street foods, which are ready-to-eat foods sold on the street by small vendors, are becoming increasingly popular (Becquey & Martin-Prevel, 2010).

DETERMINANTS OF RISK FACTORS

The dietary diversity that caused anaemia in pregnant women is partly determined by access to a food market and highly depends on their traditional food culture. In Burkina Faso, women do not get enough budget for family food and most of the people grow their own food. Unequal family food distribution contributes to low diet diversity and inadequate food intake in pregnant women as well. The pregnant are not allowed to eat meat and eggs during pregnancy (Custodio et al., 2020).

Except for food access and diversity, their attitude and knowledge to anaemia and Iron Folic Supplements (IFS) are determinants of anaemia development. Women in Burkina Faso are provided with IFS and policies of iron supplementation for pregnant women established for several years. However, their limited understanding of anaemia and the important role of IFS/iron, no clear perception of the severity of anaemia, their worries for gastrointestinal side effect of IFS and their aversion to IFS prevent women from correct behaviour. Although part of some pregnant women trusts iron supplementation, they do not have enough self-efficacy to take IFS when out of the hospital (Compaore et al., 2014).

1.4 ASSESSMENT OF THE CAPACITIES OF THE COMMUNITY

The majority of Burkina Faso's population is made up of women, the young population represents a large part of the Burkinabe population. Although constantly improving, the literacy rate remains insufficient, especially among girls. Girls' schooling remains an enormous challenge in sub-Saharan Africa, Burkina Faso has made significant progress in education through a ten-year plan, but it still faced gender inequality. Which encroaches on women's rights and makes them inferior to men. It has also been shown that a good education for young girls would significantly reduce poverty and thus economic growth in the country. Anaemia during pregnancy has an impact on the health of women, their offspring, and society. This mostly occurs among rural and poor areas of the country. Actors' investment in the community is essential in this context.

1.5 PROGRAM OUTCOMES

The primary outcome of the program is to decrease the prevalence of anaemia among pregnant women in Burkina Faso. The program's success can be measured by monitoring changes in anaemia prevalence rates before and after program implementation. This can be achieved by changing the dietary behaviour in rural areas. This will be achieved through comprehensive information and promotion of a balanced diet. These measures are expected to eventually result in the improvement of iron levels among pregnant women. The program can increase awareness and knowledge among women of reproductive age, healthcare providers, and the public about the importance of preventing and treating anaemia during pregnancy. This can lead to increased demand for anaemia prevention and treatment services.

1.4 TAGERT POPULATION GROUP FOR THE INTERVENTION

The inclusion criteria for the study subtends women of reproductive age between 15 and 25 in Nouna province, Centre-Ouest region who permanently live in the study area and have no willingness to move from their villages at least for the duration of the study and are willing to

comply with the study conditions and undergo blood testing for blood iron (ferritin) and haemoglobin level.

STEP 2: PREPARING MATRICES OF CHANGE OBJECTIVES

2.1 HEALTH BEHAVIOURS AND ENVIRONMENTAL CONDITIONS NEEDED TO CHANGE TO IMPROVE HEALTH AND QUALITY OF LIFE OUTCOMES.

As mentioned in step 1 of our intervention, dietary habits remain the leading cause of anaemia among women in Burkina Faso. As part of the poorest countries, most of the population lives below the poverty line, making it difficult to adopt a healthy eating habit.

Most families consume staple foods that are very often composed of the same base (cereals: millet, corn, rice, sorghum ...) with an accompaniment of sauce that also differs very little (o (okra, amaranth leaves, baobab, ...). Mostly insufficient in quantity and poor in nutrients (iron), the priority is given to the head of the family and children to the woman's detriment. The consumption of fruits and vegetables is not a common habit in Burkina Faso, however, there are so-called seasonal fruits covering all periods of the year.

In view of the above, a diet low in essential nutrients and inadequate consumption of fruits and vegetables play an important causal link with the occurrence of anaemia in women of childbearing age. Hence, the focus of this intervention is to address the problem by stimulating change in dietary habits through the implementation of teams within the community (women's cooperatives). This team will oversee training, and sensitization campaigns to lead to a better choice of healthy foods habit. Therefore, the change in dietary pattern is the expected outcome of this intervention with the purpose to reduce the prevalence of anaemia.

The general outcome of our intervention focuses on women at reproductive age between 15 and 25 influenced by an environmental factor which is the household pattern. Decision makers of this household organization are men (fathers), leading to unequal food distribution in the family. In this regard, the expected behavioural outcome is the diversification of food consumption, and the environmental outcome is the adequate distribution of foods at the household level.

2.2 TO SUBDIVIDE BEHAVIOURAL AND ENVIRONMENTAL OUTCOMES INTO PERFORMANCE OBJECTIVES (TABLE 2)

- Objective for women of reproductive age (15-25): Daily consumption of balanced diet.

- Objective for environmental agent: ensuring regular food availability at household level.

2.3 TO SELECT IMPORTANT AND CHANGEABLE DETERMINANTS OF THE HEALTH BEHAVIOUR AND ENVIRONMENTAL CONDITIONS.

Based on our analysis in step 1, we have determined several factors and determinants that influence the prevalence of anaemia among women of reproductive age. Some determinants have been chosen based on the analysis. These include knowledge, attitude and culture/norms for the environmental conditions and health behaviour that can be changed.

2.4 CHANGE OF MATRICES.

Table 2: Change of matrix for women of reproductive age (15-25)

Performance objectives	**Determinants**		
	Knowledge	**Attitude**	**Self-efficacy**
P.O.1 Consume at least 3 fruits and vegetables.	**C.O.1**Define the specific fruits and vegetables that are available locally, their nutritional value, and how to prepare them for consumption.		**C.O.2**Confidence in their ability to overcome any barriers or challenges that may arise, such as the cost or availability of fruits and vegetables.
P.O.2 Increase the frequency of household food consumption.	**C.O.3**Define the local food environment, including the types of foods available, their nutritional value, and how to prepare them for consumption**.**		**C.O.4** Confidence in their ability to influence the food choices and consumption patterns of their households and families.
P.O.3 Incorporate diverse food into their daily meals	**C.O.5** understanding the nutritional value of diverse foods, their benefits		

Table 3: change of matrix for the Family

Performance objectives	**Determinants**		
	Knowledge	**Attitude**	**Self-efficacy**
P.O.1 Increase availability and accessibility of iron rich fruits and vegetables	**C.O.6** Define the importance of iron-rich fruits and vegetables for preventing anaemia and maintaining good health.	**C.O.7** Recognise the role of consuming iron-rich fruits and vegetables, such as the belief that they are tasty, healthy, and important for maintaining good health.	
P.O.2 Increase animal source food availability at household level		**C.O.8** Recognise the importance of women consuming animal food source and their impact on their reproductive health	
P.O.3 Encouragement of sustainable farming practices	**C.0.9** Label types of crops that are suitable for the local environment and best agricultural practices for growing these crops.	**C.O.10** A belief in the importance of their role in improving their family's nutrition and overall health outcomes through sustainable agriculture practices.	

STEP3: SELECTING THEORY-INFORMED INTERVENTION METHODS AND PRACTICAL STRATEGIES

Table 4:

Change objectives.	Methods	Parameters for use	Applications
Change objective of women of reproductive age			
KNOWLEDGE			
C.O.1 Define the specific fruits and vegetables that are available locally, their nutritional value, and how to prepare them for consumption. **C.O.3** Define the local food environment, including the types of foods available, their nutritional value, and how to prepare them for consumption. **C.O.5** Understanding the nutritional value of diverse foods, their benefits.	Repeated exposure Belief selection	Neutrality of original attitude. Requires investigation of the current attitudinal, normative, and efficacy beliefs of the individual before choosing the beliefs on which to intervene.	-Posters highlighting various fruits and vegetables that are beneficial to alleviate anaemia -Distribute brochures containing locally available foods and their nutrition values to each family to increase their knowledge and awareness of the relation between a diversified diet and anaemia -Organize Nutrition education sessions
Self-efficacy			
C.O.2 Confidence in their ability to overcome any barriers or challenges that may arise such as the cost or availability of fruits and vegetables	Facilitation	Requires real changes in the environment instead of in the perceptions of the environment. Requires the identification of barriers and	-Create community garden for fruits and vegetables farming -Government subsidiary of agricultural inputs like seeds, fertilizers

		facilitators and the power for making the appropriate changes. Facilitating conditions on one environmental level are usually dealt with by intervening on a higher environmental level.	
C.O.4 Confidence in their ability to influence the food choices and consumption patterns of their households and families	Persuasive communication	Messages need to be relevant and not too discrepant from the beliefs of the individual; can be stimulated by surprise and repetition. Will include arguments.	-Organizing focus group discussion focusing importance of integrate women in family food decision and the role of the environmental agent in food choice - Cooking demonstration

Table 5:

Change objective for the family			
KNOWLEDGE			
C.O.6 Define the importance of iron-rich fruits and vegetables for preventing anaemia and maintaining good health.	Repeated exposure	Neutrality of original attitude.	• Distribute brochure containing local available foods and their nutrition values. • Organize Nutrition education sessions
C.O.9 Label types of crops that are suitable for the local environment and best agricultural practices for growing these crops.	Discussion	Listening to the learner to ensure that the correct schemas are activated.	• Organize focus group gathering ideas about local crops from community residents.
ATTITUDE			
C.O.7 Recognise the role of consuming iron-rich fruits and vegetables, such as the belief that they are tasty, healthy, and important for maintaining good health.	Feedback	Feedback needs to be individual, follow the behaviour in time, and specific.	• Recognize families doing good in community via video and posters
C.O.8 Recognise the importance of women consuming animal food source	Repeated exposure Facilitation	Neutrality of original attitude.	• Distribute brochure containing local

and their impact on their reproductive health		Requires real changes in the environment instead of in the perceptions of the environment. Requires the identification of barriers and facilitators and the power for making the appropriate changes. Facilitating conditions on one environmental level are usually dealt with by intervening on a higher environmental level.	available foods and their nutrition values. • Organize Nutrition education sessions together with cooking class. • Providing animal (rabbit or chicken) to families for meat sources (this activity will be done at the beginning of the intervention by the program)
C.O.10 A belief in the importance of their role in improving their family's nutrition and overall health outcomes through sustainable agriculture practices.	Guided practice	Subskill demonstration, instruction, and enactment with individual feedback; requires supervision by an experienced person; some environmental changes cannot be rehearsed.	• Teach through "farmer school" at community level of sustainable agriculture practices to women and men in community (the farmer school will informal school organized with the community) • Give feedback of the agriculture practice by the trainers from the farmer school

There are several strategies that we have identified to facilitate the success of our intervention. These include creating posters and brochures to disseminate information,

organizing focus groups to gather feedback and insights from the participants, offering cooking classes to educate individuals on healthy meal preparation and establishing community kitchen gardens to promote sustainable food practices. By utilising a combination of these strategies, our intervention can effectively raise awareness, foster community engagement, and promote positive behaviour change towards healthier lifestyles.

STEP 4: PRODUCING PROGRAM COMPONENTS AND MATERIALS

4.1 SCOPE AND SEQUENCE OF THE PROGRAM

The intervention will be launched with a meeting with local government and community leaders to give an overview of the whole intervention and the timeline to finish each step with the key actors and stakeholders. This will be followed by the informative session and community health promotion sessions which are organized by community health workers and supported by community leaders. The Information Session is an information campaign designed to raise the health awareness of our target population and change the way the environmental agents (the head of the household) think about their daughter's and/or wife's health. The informative session is an information campaign that is devoted to raising health awareness of our target population and changing the way the environment agents (the household leader) think about their daughter' and/or wife's health.

Analogously, the community leaders and health workers will have focus group discussions with the target populations and the head of household giving them an overview of the intervention, delivering the benefits of the intervention, and stressing the importance of iron for reproductive-age women to prevent diseases from iron deficiency, pregnancy and postpartum. Furthermore, the health workers will distribute nutrition brochures and put-up health promotion posters on bulletin boards. Later, they will organize weekly community meetings to teach residents nutrition knowledge and separate cooking skills twice a week during the first stage of the intervention. To obtain enough food and nutrients from food, the local government will organize farmer training and give each family free animal protein sources. The feedback and consulting session will be held after the campaign. Community health workers and community leaders will do a regular evaluation and assessment of the intervention. Rewards (domestic animals or meals or other equivalent things) will be given as incentives for keeping good behaviours.

The following table presents the scope and sequences of the intervention. The timeline, main activities, and participants are listed in the table.

Table 6:

Phase	Participants	Activities	Delivery channels
Phase 1 (1-2 months)	Local government Community leaders Ministry of Health	1. A preliminary meeting with local government and community leaders to present them with the goals and long-term benefits of the intervention. 2. Show the timeline of the key steps and activities of intervention to government and community leaders. 3. Get official permissions for the intervention from the local government	Conference meetings with government staff, and community leaders are organized by working groups. PowerPoint presentation A formal conference
Phase 2 (3-6 months)	Research coordinators, community leaders, the enumerator	4. Surveys about nutrition status of reproductive age women in local community by focus group discussion; Analyse nutrition value of local food	Focus group discussion -
	Nutritionist, NGO, working group, community health worker, Ministry of finance and commerce.	5. Put up informative posters about this intervention program in community bulletin board. 6. Community health worker training and nutrition intervention experience sharing from NGO staffs. 7. Making food and nutrition guideline brochures and posters according to local food	Training class; PowerPoint; \ Food survey; seminars
Phase 3 (7-8 month)	Community leaders; community health workers; working group.	8. Making plans for nutrition class and culinary session	Focus group. Community meetings organized by community leaders.

	Community leaders, working group, Ministry of finance and commerce.	9. Inform local people about the intervention within community. 10. Mobilise the head of household and reproductive age women by telling them the benefits. 11. Construct kitchen garden at community leaders' yard	Focus group discussion held by community leaders and health workers. -
Phase 4 (9-11 month)	All participants	12. Ask feedback from community members, health workers to refine the intervention details. 13. Refine intervention details	Formal meetings with government staff, NGO, focus group meeting with community members
Phase 4 (11-13 months)	community health workers, head of household, Ministry of finance and commerce, reproductive age women, local government, community members	14. Nutrition class (once every two weeks on Sunday) with free meal as incentives 15. Family cooks gather around cooking healthy meal under the guidance of community health workers. 16. Community members will be taught and trained of sustainable farming skills. 17. Distribution of animals (i.e., rabbits, chickens), build kitchen gardens, and vegetable seeds dissemination	Lectures, PowerPoint presentation, nutrition brochures Cooking workshops, lectures and practice, nutrition brochures - PowerPoint, workshops Domestic animals, seeds
Phase 5 (14- 30 month)	Coordinate researchers, community health workers, Community leaders, reproductive age women,	18. Monitor and evaluate the implementation according to the plan. 19. Praise session to award the families having good performances with meat or animals every 6 months	Focus group discussion; family visits. Meat/animals

4.2 MATERIALS AND BUDGET

The table below indicates the budget and materials required for the intervention. The cost of the intervention includes the response team, utilities, logistics materials, **and** operational costs. This list, however, is a crude estimate, and it does not consider the financial context of the intervention site. The population of Nouna is estimated at 366,934 individuals in 2018 with 49.5% women and 50.5% men with a distribution of 50,927 households (Données Statistiques – Centre De Recherche En Santé De Nouna, n.d.).

Table 7: Materials and Budget

Budget Type	***Numbers***	***Average Unit price (Euros)***	***Duration***	***Total cost (Euros)***
Personnel				
Economist	1	1,000/month	3 months	3,000
Nutritionist	1	1,000/month	6 months	6,000
Research coordinators	2	1,000/month	6 months	6,000
Enumerators	4	50/day	30 days	1,500
Community health workers	10	30/day	60 days	3,000
Community farmer trainer	10	20/day	60 days	3,000
Drivers	2	100/day	90 days	9,000
Utilities				
Vehicle and fuel consumption	2	50/day	90 days	4,500
Cooking materials		100/day	12 days	1,200
Logistics				
Computers/laptops	4			2,000
Projectors	1			300
Posters	30	10		300
Brochures	500	2		1,000
Operational cost				
Iron folic acid supplements				2,500
Deworming tablets				1,500
Training costs	4	300/session	20 sessions	6,000
Total above				50,800
Miscellaneous cost		**10% of total cost**		5,080

4.3 THEME: "EMPOWERING WOMEN, NOURISHING FUTURES"

This theme encompasses the key aspects of the intervention, emphasizing the importance of empowering women and focusing on nutrition to improve their overall health and the well-being of their future children.

"Empowering Women, Nourishing Futures" communicates the following ideas:

- Empowerment: it highlights the need to empower women by providing them with knowledge, resources, and support to take control of their health and make informed decisions regarding nutrition.
- Nourishing: the theme emphasizes the significance of proper nutrition, specifically addressing anaemia prevention through the consumption of iron-rich foods and a balanced diet. It reinforces the idea that nutrition plays a vital role in the health and development of both mothers and their unborn children.
- Future-oriented: by focusing on the nourishment of futures. The theme acknowledges the long-term impact of addressing anaemia in women. It highlights the potential for healthier outcomes not only for the mothers but also for the next generation, stressing the importance of investing in the health of both.
- Positive outlook: it carries a positive tone, promoting optimism and hope. It suggests that by empowering women and addressing anaemia; we can create a brighter future for families and communities.

The theme encapsulates the goals and aspirations of the intervention, rallying support, and inspiring action to reduce anaemia prevalence in women and promote better health outcomes for generations to come.

STEP 5: PLANNING PROGRAM ADOPTION, IMPLEMENTATION, AND SUSTAINABILITY

5.1: To identify potential users of the health promotion program

Q1: Who will decide to use/adopt the program?

Following an awareness of the intervention's components, local governments will embrace the program. The program will be implemented at the community level, using created official documents utilized as guidelines and instructional materials for the implementation stage.

Q2: Who will the decision makers need to consult?

To be educated, decision-makers will need to confer with health specialists involved in this intervention, such as nutritionists and economists, as well as healthcare providers at large. A consultation with the beneficiaries is also required to understand their requirements and what can be done to enhance their lives. A consultation with government institutions such as the Ministry of Health, Ministry of Education, Ministry of Agriculture, Ministry of Finance, and other government agencies is required to understand what has been done and what can be done, as well as the progress and various programs that can align with the intervention.

Q3: Who will implement the program?

This program will be implemented at the community level by community health workers, nutritionists, economists, trained enumerators, and non-governmental organizations (NGOs) with the coordination from the government. Their responsibilities and planned activities are explained respectively in Table 1 and Table 6.

Q4: Will the program require different people to implement different components?

The program will require experts in different field for the intervention implementation. For instance, economists are needed to train our beneficiary regarding financial literacy.

Q5: Who will assure that the program continues as long as it is needed?

The program will be conducted by community health professionals who are involved in the everyday lives of the program's beneficiaries to ensure its sustainability. Furthermore, the involvement of community leaders, family members, and especially men in the lives of beneficiaries will have an impact on program durability. Finally, women of reproductive age

(the intervention's beneficiaries) will play an important role in ensuring the intervention's long-term viability so that other women can benefit from it.

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