

AQUACULTURE PROJECT PLANNING AND APPRAISAL

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ABSTRACT

This study reviews the role of aquaculture project planning and appraisal in Nigeria's fisheries and aquaculture sub-sector as part of the larger effort in the quest for food fish security in Nigeria. The focus was on human capacity building in the subject matter. There is a great need for the development of local capacity on small-scale, medium-scale and large-scale project formulation and appraisal even at undergraduate level to realize and sustain the set target in the fishery sub-sector of the Agricultural Transformation Agenda (ATA) of present administration in view of the fast growing aquaculture industry in Nigeria. The important roles of project planning and appraisal techniques as vital stages in the development of aquaculture projects are reviewed under the following sub-headings: the link between projects and national development plans, the nature and characteristics of aquaculture projects, types of aquaculture projects, project sequence and cycle, project appraisal, and so on. The main aim is to ensure that, as its contribution to overall national development efforts, investment decisions and actions in fisheries and aquaculture sub-sector are based on well formulated and environmentally friendly projects.

KEYWORDS: Aquaculture, projects, planning, appraisal, national plans, clean environment.

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INTRODUCTION

The total local fish production in Nigeria currently stands at 700,000 tons per annum while average importation is estimated at some 800,000 tons per annum. However, projected demand for fish in Nigeria stands at about 3 million tons suggesting actual shortfall of 1.5 million or 50% of the estimated demand (Odusote, 2013). In 2010, the total aquaculture investment and capital contribution in Nigeria were put at N7 billion and N20 billion respectively (Faturoti, 2010). This figure is considered encouraging but much more is expected from aquaculture production in Nigeria. The fishery sub-sector of agricultural transformation agenda under the chairmanship of President Goodluck Jonathan and the stewardship of DrAkinwunmiAdesina, the Honourable Minister of agriculture, has set a transformation target for the increased and sustainable production of 1 million tons of aquaculture fish per annum for the next 5 years (Odusote, 2013). In 2010 alone a total of 340 students from various universities, polytechnics and colleges of education across Nigeria were in African Regional Aquaculture Centre (ARAC), Aluu, Rivers State for their 6 months supervised industrial work experience (SIWES) program (Oparaet *al.*,2010). Majority of these students lacked the necessary skills in project formulation and appraisal. These young students are the future leaders of our dear country, Nigeria and as such they should be equipped with the necessary skills in project formulation and appraisal early in their academic training. There is, therefore, a great need for the development of the local capacity on small-scale, medium-scale and large-scale project feasibility studies, project preparation, analysis and appraisal even at undergraduate levels to realize and sustain the set target in the fishery sub-sector of the Agricultural Transformation Agenda (ATA) of present administration.



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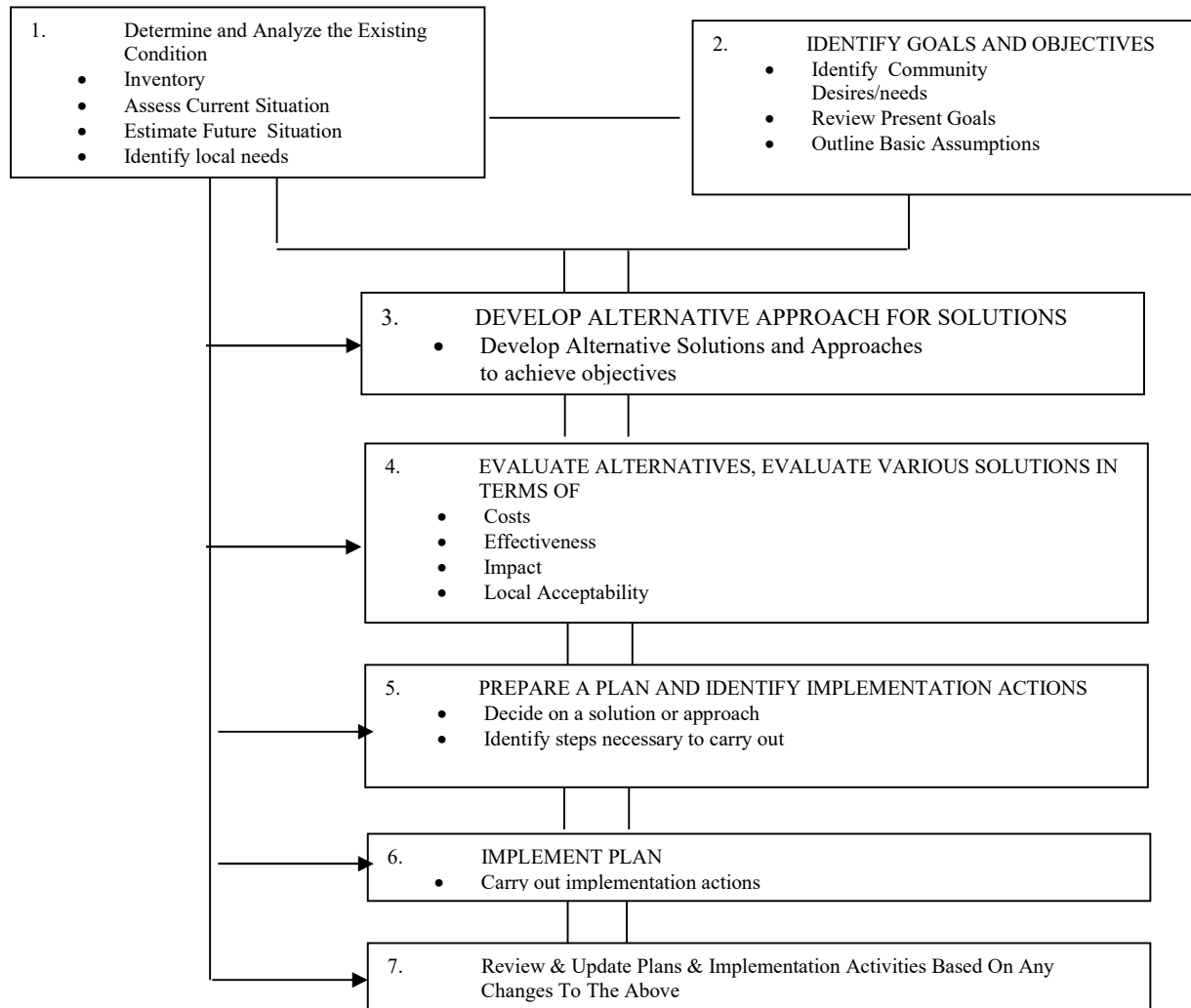
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This paper reviews project planning and appraisal techniques as vital stages in the development of aquaculture projects in the overall quest for national development. The main focus is on the nature and characteristics of aquaculture projects, types of aquaculture projects, and project sequence and cycles and project appraisal. The main aim is to ensure that investment decisions and actions in the fisheries and aquaculture sub-sector in Nigeria are based on well formulated projects.

PLANS, PROGRAMES AND PROJECTS

What is a Plan?

Every developing country such as Nigeria has a national plan which usually contains a set of economic and social objectives and strategies for their achievement. A “plan” is a document that results from the planning process (Ibeakuzie, 2003). The document serves as a tool for fast-tracking economic growth, hence it is



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often referred to as a development plan. The objectives in the national plan, as expected, are national and broader in outlook. All sectors of the economy are represented in the development plan or document, and during annual budget preparations financial allocations are made to the different sectors represented in the national plan. An example of a planning process is given in figure 1.

What is a program?

A program is a tool for achieving the stated objectives in the national plan. Each program has its own set of objectives which are in line with the overall development plan from which specific projects are identified and selected.

What is a project?

A project may be defined as a set of organized activities directed to achieve specified objectives within a specified time frame and financial budget. As stated earlier a project originates from a program. It is conceived not in isolation but within an overall national economic development plan. All projects have certain features in common. They: (i) have specified objectives or purpose, (ii) have a definite time frame for implementation, (iii) have to be completed within a fixed budget.

Relationship between Plans, Programs and Projects

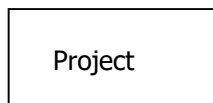


Fig. 2: Project

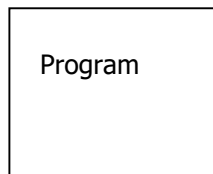


Fig. 3: Program

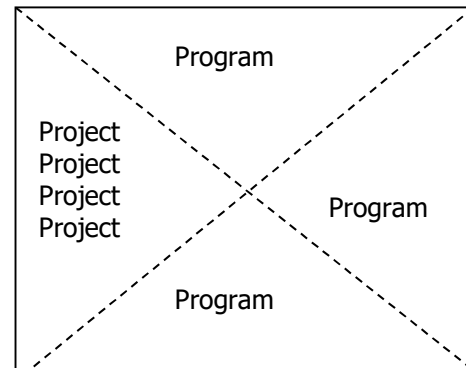


Fig 3: program

Figures 2, 3 and 4 illustrate the relationship between plans, programs and projects.

The project is the smallest unit in the relationship (figure 2) followed by program (figure 3) and then by plan (figure 4) in that order. Figure 4 demonstrates that a plan may contain several programs while a program in turn may contain several projects of various sizes and nature. In this arrangement, plans and programs provide background information which facilitates analysis of project investment proposals. Therefore, projects can be regarded as components of a large less precisely defined program. It is easily seen therefore that projects can be distinguished from programs in several respects such as size and level of definition. Although a whole program could be subjected to analysis as a single project, it is generally reasonable to keep projects close to the minimum size which is economically and technically feasible. If projects' size and complexity approach that of programs, high returns from one part of the project will mask the low returns from the other and so the project may be difficult to manage efficiently.

WHAT IS AQUACULTURE?

Aquaculture can be defined as the rearing of aquatic plants and animals such as sea weeds, crustaceans, molluscs, amphibians, reptiles, and fish in enclosures or confined aquatic environments (Ansa, 2012).



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Aquaculture is a multidisciplinary field of study. Its major sub-disciplines include biology, biochemistry, engineering, surveying, chemistry, veterinary science, extension, economics, law, and sociology (SEAFDEC, 1985; Uzukwu *et al.*, 2010). Successful aquaculture projects, therefore, require inputs from professionals from above mentioned sub-disciplines from inception right up to completion.

Nature and Characteristics of Aquaculture Projects

As stated earlier aquaculture is by its very nature a multi-disciplinary field of study, and so aquaculture projects are equally multi-disciplinary in nature. However all projects, whether aquacultural or not, are investment activities that have a limited defined sequence and defined expected results. Frequently each aquaculture project is unique not only in scope but in intensity. An aquaculture project could be practiced under extensive, semi-extensive, intensive, or hyper-intensive level in terms of stocking rate, feeding regime, and system management. Aquaculture projects are also capital intensive and require the commitment of scarce resources, which prevents the use of those resources elsewhere. The resources are financial capital, raw materials, biological materials, water, feed, unskilled and skilled labour, managers, land and so on. Most of these certainly have alternative possible uses elsewhere.

In Nigeria, agriculture is on the concurrent list, and so aquaculture projects may be undertaken by the three tiers of government as well as the private sector. Aquaculture projects planned for public sector or private sector in partnership with government may be defined as a set of proposals for the investment of resources into fixed productive capacity, through clearly identified actions that are expected to produce future benefits of a fairly specific kind, the whole series of actions being the subject of individual planning and examination before being adopted and implemented with a single overall financial and managerial framework (Unpublished report). In this case a project manager is appointed with full responsibility for seeing the project through to commissioning.

Types of Aquaculture Projects

Aquaculture projects can be classified based on the number of farm produce produced in the farm:

- (i) Single-purpose project such as table fish project, fingerlings production project, and fish feed production project.
- (ii) Multipurpose projects – a group of related goods and services can be provided more cheaply from a multipurpose project than from the most economic, alternative single-purpose projects. Integrated fish cum piggery, poultry, rabbitry, and crop production project, where waste from one component can be an input into another, is a striking example.

Another way to classify aquaculture projects is in terms of geographical location from: (i) inland or freshwater fish farm projects, and (ii) coastal or brackish water fish farm projects. In terms of size aquaculture projects can be classified as: (i) small size projects, (ii) medium size projects, (iii) large size projects, reflecting the level of resource commitment.

Projects can also be formulated based on type of culture system as: (i) monoculture, (ii) polyculture, (iii) monosex culture, (iv) integrated culture, and (v) water recirculation system, (vi) partition culture system.

In the area of research and development aquaculture projects can be classified as: (i) experimental project,

(ii) pilot project, (iii) demonstration project, and (iv) replication projects.

(i) Experimental projects: They are in general small scale, highly exploratory, risky projects that do not provide immediate economic returns. They are useful in the acquisition of new knowledge, new technology, and new products.



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(ii) Pilot projects: They can test the applicability of experimental results in places with conditions similar to those under which the experiments were conducted; they can test the feasibility and acceptability of new products or technologies in new environments, thereby extending the proven feasibility of a new finding beyond the experimental stage.

(iii) Demonstration projects: The purpose of a demonstration project is to show that the new methods or technologies are better than old ones in terms of productivity, cost effectiveness, efficient delivery of services and income generation. Their major objective is to showcase the benefits of the new innovations to potential adopters.

(iv) Replication projects: The dissemination of tested methods or techniques through replication projects is the final stage in an experimental series. The major contribution of these projects is to expand productive capacity.

AQUACULTURE PROJECT PLANNING

Every project requires sound planning for it to achieve its objectives. Planning or the process of planning is a series of logical, common sense steps that are used in arriving at a decision on how best to achieve a desirable future objective. Thus all planning activities: (i) deal with the future, (ii) assist in making decisions and (iii) help achieve desired goals. So the day-to-day functions of a project planner are: (i) development of plans, (ii) assisting in implementation of plans (Ibeakuzie, 2003). Project planning in aquaculture proceeds through several steps or stages. The stages are identification, preparation, appraisal, implementation and evaluation.

Project Sequence and Cycle

Project typically runs through several stages of activity or cycle from conception to completion (Grover, 1983). An analysis of the project cycle is important for two reasons. Firstly, the cycle provides an outline or a summary of tasks to be performed by different organizations, each considered important to the success of the project. Secondly, the cycle provides a framework for seeing the complexity of the project and for ordering of developmental activities. The basic model of a project cycle as reported by Uzukwu (2010) recognized five main stages, namely: (i) Identification, (ii) Preparation, (iii) Appraisal and Selection, (iv) Implementation, and (v) Evaluation. The project cycle can be considered as a comprehensive sequence in the sense that each stage naturally follows the preceding one and leads onto the next cycle.

Identification:

Generally the motivation for a project may be resource-based, that is, may stem from the opportunity to make profitable use of available resources. It may be market- based, that is, arising from an identified demand locally or overseas. It may yet be need-based, that is, the motivation is to make available to all people in an area some basic material requirements and services. For instance the huge deficit between fish demand and supply in Nigeria (Anyanwu, 2006) would justify establishment of more fish farms across the country. Most projects start as rudimentary ideas in search of a solution to a problem. At this stage possible sources of funds must also be identified.

Preparation

Project preparation begins with pre-feasibility and feasibility studies. Resource base (environmental, biotechnical, and socio-cultural) investigation is undertaken, since not all sites are suitable for aquaculture projects. During this stage project alternatives that can mitigate the problem are also identified. Then follow the design of the pond system and support facilities of the project. It includes the preparation of a feasibility



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report or a set of operational proposals for the project that are locationally, biotechnically, socio-economically, and financially feasible. The report contains decisions that have been made on scope of the project, location and site, soil properties and water supply requirements, oxygen supply, project size and intensity, biological and manpower requirements, marketing strategies, financial returns and so on. The feasibility report contains full technical specifications of distinct proposals and full details of financial and economic costs and benefits expected from the project.

APPRAISAL and SELECTION

Appraisal

In this stage a comprehensive and systematic review of all aspects of a project proposal is undertaken. Generally, it is safer to use internal government or company staff only for this task, and not consultants. Projects should be appraised first at the desk and then in the field. Appraisal should cover the following areas:

- (i) Technical -is what is proposed reasonable and achievable?
- (ii) Financial -Have the requirements for funds needed bythe project been properly calculated, their sources well identified, and adequate arrangements made for their repayment where necessary?
- (iii)Commercial -How will the necessary inputs for the project be sourced, and are adequate arrangements made for the disposal of the produce?
- (iv) Incentive - Are arrangements so well made that all stakeholders who will contribute capital will be happy to do so, at least to the extent proposed in the plans?
- (v) Economic - Does what is proposed in the plan make economic sense from the standpoint of personal, corporate or national development interest when all aspects of the project (positive and negative) have been taken into consideration and correctly valued?
- (vi)Managerial -Do those who will be responsible for operating the project have the capacity to do so satisfactorily, and do they have enough power and scope to do what is required?
- (vii) Organizational - Is the project so organized internally and externally into departments as to allow the proposals to be implemented properly and flexibly to allow for changes that may be necessary as the project progresses?
- (viii) Environmental - Was environmental impact assessment study carried out for the project? Are there provisions made for safe disposal of effluents that will be generated in course of operating the project?

The foregoing questions are the subject of a typical appraisal report.

Selection

Based on the appraisal report, final decisions are taken regarding whether to adopt and select the project or discard it. The selection stage is the stage where decision-makers, including financiers, host communities, and other stake holders determine whether or not the project will be implemented. If environmental impact assessment (EIA) was carried out, the environmental impact statement (EIS) will play a prominent role in the decision of the host communities irrespective of the technical and economic feasibility reports of the project. If the project involves loan finance, the financier will certainly carry out his own appraisal before signing loan agreements and final release of funds to the borrower(s). Frequently comments made at the



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appraisal stage result to alterations in the project plan. After the selection stage the project proposal is ready for implementation.

Implementation

In this stage, funds are disbursed to set up the project and get it running. It is important to ensure that the project is carried out as proposed in the plan. However problems frequently arise when the economic and financial environments at implementation differ from that expected during appraisal. Consequently the original proposals must be modified, though with difficulty, because of the need to forge ahead in implementation. During implementation stage many of the real problems on site are identified, and so a feedback mechanism has to be put in place for the benefit of all stake holders and for future projects.

Evaluation

During this final stage, the project is evaluated and the lessons learnt are identified so that future projects can be improved accordingly. The evaluation is aimed at looking back over the implementation activities in comparison to actual targets, and to judge whether the decisions and actions taken were in the best interest of all stakeholders. The existence from the outset of well prepared alternative project proposals is imperative. Ibeakuzie (2003) emphasized this in his summarized basic steps of a generalized comprehensive planning process as given in figure 1 and Table 1.

Table 1. Basic steps of the planning process

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1. Determine and analyze the existing situation
 2. Identify goal(s) and objectives
 3. Develop alternative approach for solutions
 4. Evaluate alternatives
 5. Prepare and adopt a plan. Identify implementation actions
 6. Implement plan
 7. Review and update plans and implementation strategy.
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SUMMARY

The process of fisheries and aquaculture projects planning and appraisal was reviewed. The important roles of project planning and appraisal techniques as vital stages in the development of aquaculture projects are reviewed under the following sub-headings: the link between projects and national development plans, the nature and characteristics of aquaculture projects, types of aquaculture projects, project sequence and cycle, project appraisal, and so on. The main aim was to ensure that, as its contribution to overall national development efforts, investment decisions and actions in the fisheries and aquaculture sub-sector are based on well formulated projects.

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