

THE ROLE OF TOTAL QUALITY MANAGEMENT AS A KEY INTERVENTION IN SMALL CONSTRUCTION CONTRACTOR CAPACITY BUILDING IN SOUTH AFRICA

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ABSTRACT

Purpose of this paper - South Africa experiences consistent economic growth that stimulates construction. But, the industry lacks skills and support structures for entrepreneurial development. Government intervened to create an enabling environment for previously (pre-1994 democracy) disadvantaged persons to enter the construction industry as emerging (small) contractors. Many resulting programmes were unsuccessful.

Methodology/Scope - A holistic and fully integrated project management approach was required to address the shortcomings. A Total Quality Management (TQM) strategy was developed as a key component of an Integrated Emerging Contractor Development Model (IECDM). A 24-month IECDM programme was introduced to cover an entire province.

Findings - Constant measuring of outcomes provided quantified and qualified data for analysis that dictated managerial interventions. The successful outcomes of the IECDM resulted in a follow-up programme to be launched in 2008. The results are also under consideration as input to the creation of a national best practice model.

Value – The methodology followed in this research to quantify the development and capacity outcomes regarding emerging contractor development in South Africa is unique and the first of its kind. The measurement tools used were all part of an overall total quality management strategy, ensuring that continuous management of outcomes delivered the required results.

Key words: Capacity building, emerging (small) construction contractors, enabling environment, mentoring, project management, Total Quality Management.

INTRODUCTION

Numerous attempts by a variety of agencies were undertaken in South Africa to develop small (emerging) construction contractors (ECs) that were disadvantaged in the pre-democratic era in South Africa before 1994. Accelerated development of ECs generally had little success, mainly due to the fragmented nature of such attempts. An Integrated Emerging Contractor Development Model (IECDM) was created, in conjunction with the author, to address the problems experienced in developing self-sustainable construction contractors for the construction industry. The industry suffers from a lack of capacity, whilst previously disadvantaged persons are in need of support to improve their entrepreneurial development, managerial and technical skills, in order to become self-reliant. This model was developed for the Eastern Cape Development Corporation (ECDC) and introduced throughout the Eastern Cape Province, South Africa, as the first holistic approach.

The problem to create an IECDM consisted of three sub problems, being firstly to identify supportive legislation, secondly to identify all the possible role players that could be sourced in

support of the holistic IECDM and thirdly to structure the programme, that was introduced, in such a way that the outcomes could be measured and the results acted upon.

The methodology applied entailed that all possible role players/agencies that could contribute to the development/empowerment of ECs were identified and their probable contributions assessed. Cognisance was taken of all legislative and other initiatives taken by government in order to create an enabling environment for ECs. The fact that these government directives are generally accepted as roadmaps for the upliftment of people in South Africa, made the introduction of the IECDM acceptable to the identified role players and other stakeholders. The Total Quality Management tool devised for the programme was based on the identification of knowledge areas and application thereof to be mastered by the ECs. These knowledge areas (45) were placed on an assessment schedule, with provision for non-quantified information to be provided. Each of the 45 knowledge areas was assessed monthly, according to a 10-point scale by the relevant mentor for each contractor. Areas of weakness were identified for each contractor and acted upon as described later. The data collected for all contractors was statistically processed and presented diagrammatically for each EC, each region and for the province as a whole.

The contributions of each role player/stakeholder in the IECDM are described, following Figure 1, which presents the complete model.

Figure 4 is a diagrammatic (overall) example of the quantified data result that was continually obtained as managerial input.

A first follow-up assessment regarding role player perspectives on the post-IECDM period has been done and is reported in this paper.

The conclusions drawn and recommendations made are thus based on the programme as a whole, including the follow-up investigation done, particularly also discounting the qualitative data provided by mentors. It is therefore broader based than the confined information contained in this paper.

The client for this programme, the ECDC, has confirmed their satisfaction with the outcomes of the IECDM and has decided to launch a repeat programme in 2008. The conclusions and recommendations that emanated from the programme reported on in this paper will form part of the follow-up 2008 programme strategies. Enhanced data collection and processing will also be introduced.

STRUCTURAL INTERVENTIONS

Government, and other organs of state have made the following structural interventions, in order to create an “enabling environment” for the rapid development of, inter alia, construction contractors (summarised by Hauptfleisch, 2006:2-3). These interventions were assimilated where possible in the development of the IECDM:

Creating an enabling environment: Construction Industry Development Board (CIDB)

The South African Government has adopted legislation to create an enabling environment, from which inter alia flowed the Construction Industry Development Board Act (Act 38 of 2000). The CIDB mandate that followed from the above legislation is encapsulated in the following abstract in the Construction Industry Development Board: Annual Report (2004/2005:12):

- Provide strategic direction and develop effective partnerships for growth, reform and improvement of the construction sector;
- Promote sustainable growth of the construction industry and the sustainable participation of the emerging sector.

Broad Based Black Economic Empowerment

Government initiatives are further supported by the Broad Based Black Economic Empowerment Act (No 53 of 2003) (BBBEE, 2003:2) that is in the implementation phase, and reads as follows: “To establish a legislative framework for the promotion of black economic empowerment; to empower the Minister to issue codes of good practice and to publish transformation charters; to establish the Black Economic Empowerment Advisory Council; and to provide for matters connected therewith.”

Construction Education and Training Authority

The Skills Development Act (Act 97 of 1998) provides for the creation of a Sectoral Education and Training Authority (SETA) for each of the various economic sectors. The Construction Education and Training Authority (CETA) is responsible for the construction industry. A levy, expressed as a % of salaries and wages paid by employers, is placed in a fund that is applied in terms of stated guidelines, to ensure that education and training take place in the industry.

STRUCTURING OF AN INTEGRATED EMERGING CONTRACTOR DEVELOPMENT MODEL

The enabling environment that has been created, as overviewed above, leaves the construction fraternity with the challenge to create a working model to achieve the stated objectives within the unique demographics of South Africa. The IECDM is a serious attempt to put such a working model to the test (Hauptfleisch, 2006:4-8).

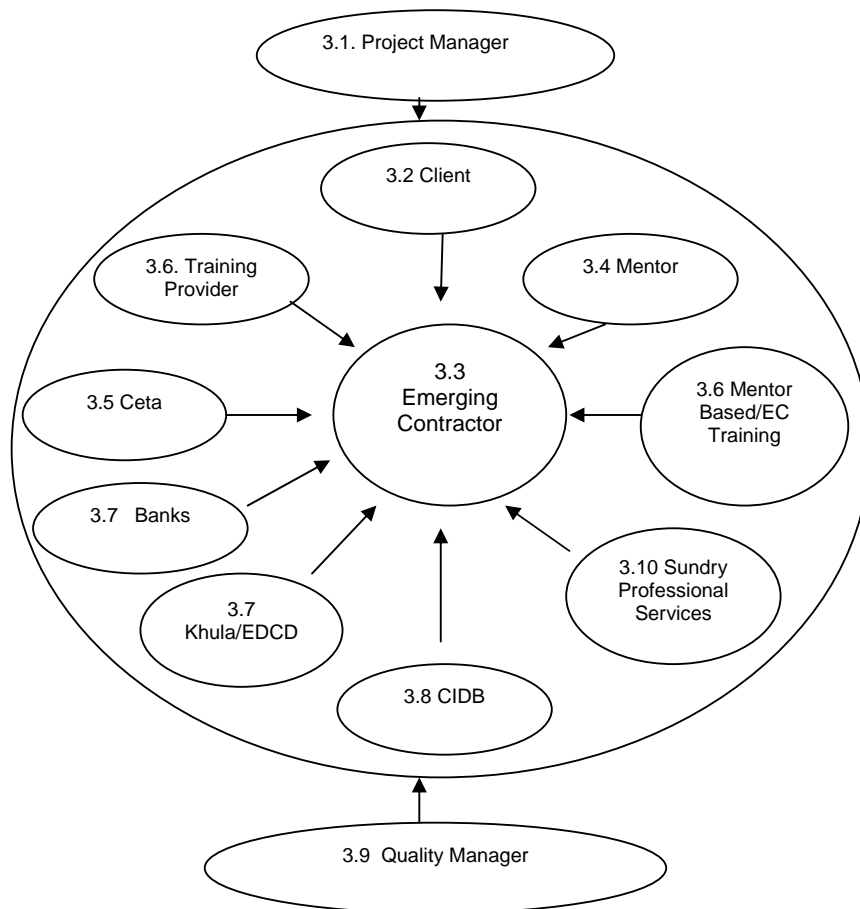


Figure 1: Integrated Emerging Contractor Development Model

Source: Hauptfleisch, 2006:5

The results obtained from the first practical introduction of the IECDM are reported in this paper.

Figure 1 is a diagrammatic presentation of the (IECDM), depicting the entire identified role players required in order to maximise the development of emerging contractors.

SELECTION OF EMERGING CONTRACTORS, MENTORS AND TRAINING SERVICE PROVIDERS

Emerging Contractors (ECs)

Emerging Contractors for the programme were selected from applicants who responded to a comprehensive advertising campaign in the Eastern Cape. A good response was obtained and the assessment to identify the most suitable candidates was conducted by the Council for Scientific and Industrial Research (CSIR) in terms of the South African Construction Excellence Model (SACEM) guidelines. Approximately 60 candidates were advised of their selection, some of whom did not take up the offer. Further selection was executed and a final group of 54 was taken on board. The programme was then structured and launched from five centres.

Mentors

Mentors for the programme were selected by inviting applications via a province wide advertising campaign. All those who aspired to become mentors on the programme were subjected to the established Mentorship Accreditation Programme of the University of the Free State.

Training Service Providers

Three training service providers were selected from the CETA database in conjunction with CETA. Two of these were a source of continuous concern and turned out to be the weakest link in the programme, requiring constant management interventions to rectify. The third provider was excellent and maintained a very high standard. All the training providers however failed to create some key competencies with the contractors.

TOTAL QUALITY MANAGEMENT (TQM): METHODOLOGY AND APPLICATION OF OUTCOMES

Indabas (meetings) and TQM Visits

In order to ensure that the required results were achieved a system of constant communication/contact was put in place. TQM being an important element of the IECDM, dictated that the entire development process of the contractors had to be managed constantly. Two activities were introduced to achieve this. Firstly, Indabas (meetings) were held in every centre, every three months, where all stakeholders were required to be present. Secondly, during the period between Indabas the TQM team visited every mentor, with the contractors assigned to each mentor present, in the offices of the mentor or on a construction project of the contractor, in order to monitor the progress of each contractor, to evaluate the interaction between mentor and contractors, to ensure that actual capacity building was taking place, to agree on corrective measures where deviations from stated objectives occurred and to generally monitor and manage the programme towards achieving the standards set.

Manual for Small Construction Contractors

The management team obtained permission from the Building Industries Federation South Africa (1990's), now Master Builders South Africa (MBSA), to adapt their Manual for Smaller Builders into a fit for purpose, for the IECDM, Manual for Small Construction Contractors (MSCC).

Quantified Data: Mentors' Evaluation of Emerging Contractors and Others

The MSCC was positioned to be a reference standard for the level of competency achieved by the contractors. The indexing of the manual was further used as reference for the monthly assessment

made by mentors of each contractor's development level. Each knowledge area contained in the index as well as some others was taken up into a ten-point assessment scale that was then assessed on a monthly basis by every mentor for every contractor. This provided the management team with a wealth of sensors (45 knowledge areas) relating to every aspect of each contractor's individual development. An effective progress measurement tool was thus created. Figure 2 is an example of the typical documentation completed monthly by the mentors. The results obtained were translated into statistical data for each contractor, combined for every region and for the IECDM as a whole. The statistical data was processed further through a computer programme, specifically designed by the CSIR for the IECDM, and presented in easily understandable diagrammatic presentations (see example, Figure 4).

Quantified Data: Emerging Contractors' Evaluation of Mentors and Others

The emerging contractors were also afforded the opportunity to evaluate the mentors and other role players on the programme. Figure 3 reflects a typical example of the documentation completed by the EC's in order to solicit their views. Their feedback, reflecting the actual experience of the beneficiaries of the programme, was very valuable as TQM input and provided very specific insights that were also used to assist with the management of the programme.

Management Development Programme

After approximately twelve months it became evident from the data obtained from the mentors that the formal training component presented by the training service providers was not going to be sufficient to create self-sustainable contractors.

Although the mentors' primary task was to assist contractors with their businesses, and business development in general, it became imperative that their terms of reference had to be expanded and that they would have to become involved in assisting to resolve knowledge gaps experienced by the contractors.

Having established shortcomings, the management team introduced a further development tool that was named the Management Development Programme (MDP). The MDP was structured in the format of a simple bar chart for the remainder of the IECDM programme. The underlying principle was to place each item contained in the MSCC on the bar chart, where after each contractor's proficiency was evaluated by the mentor regarding each specific knowledge area in the MSCC. The mentors were then required to intervene and specifically oversee capacity creation in areas of weakness. This intervention is visually very evident from Figure 4, showing the specific impact of the MDP from June 2006 onwards.

CONSTRUCTION EDUCATION AND TRAINING AUTHORITY (CETA)

The Role of CETA

As the statutory body responsible for training in the construction industry, it was obvious that CETA participation should be sought in the IECDM. It was agreed with CETA that the contractors on the IECDM would be accepted for training in order to earn a qualification, deviating from the normal tripartite agreement involving the contractor, a training provider and an employer. In this instance the ECDC was accepted as fulfilling the role of the employer, supported by the mentorship intervention. The Learnership that was selected for the IECDM is the NQF Level 2, Construction Contractor Learnership.

NAME OF EC: _____
 NAME OF MENTOR: _____
 REGION: _____
 DESCRIPTION OF PROJECTS: _____
 DATE OF EVALUATION: _____

PROGRESS EVALUATION: NQF LEVEL 2

The progress evaluation is based on a 10-point scale for which minimum standards to be achieved are determined by the Mentor and Emerging Construction Contractor Programme: Setting of Minimum Standards for Quality Assurance of Integrated ECDP. Progress evaluation is also required regarding a number of items not contained in the above programme, i.e. technical advancement (See item 4)

The 10-point tick box scale to be utilized as follows (benchmarks only provided, use entire scale for evaluation).

- 1 = The EC is not capable at all to execute this activity independently
- 5 = EC is capable to execute this function with assistance
- 10 = EC is capable to execute this function independently on a sustainable basis

ASPECTS TO BE EVALUATED: DEVELOPMENT OF BUSINESS PROCESSES

1	2	3	4	5	6	7	8	9	10
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SECTION 1: RUNNING A SMALL BUSINESS

A. ADMINISTRATION:

1. The Business plan: Development achieved

Comments: _____

Figure 2: Mentor’s Monthly Evaluation of Emerging Contractor

Source: Hauptfleisch, 2006.

Training Methodology

The training methodology followed consisted of a dual system, having a classroom training component and structured workplace experience, the latter supported by mentors. The classroom training was scheduled to take place over a 24-month period with two full days of training every week

EMERGING CONTRACTOR'S MONTHLY PROGRESS EVALUATION OF MENTORING PROCESS

NAME OF EC: _____

NAME OF MENTOR _____

REGION: _____

DESCRIPTION OF PROJECTS: _____

DATE OF EVALUATION: _____

PROGRESS EVALUATION: NQF LEVEL 2

The progress evaluation is based on a 10-point scale for which minimum standards to be achieved are set against the Mentor and Emerging Construction Contractor Programme: Setting of Minimum Standards for Quality Assurance of Integrated ECDP.

The 10-point tick box scale to be utilized as follows (benchmarks only provided, use entire scale for evaluation).

- 1 = Poor
- 5 = Average
- 10 = Excellent

1. Evaluation of relationship with mentor and quality of support provided to EC

1	2	3	4	5	6	7	8	9	10
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Comments: _____

Figure 3: Emerging Contractor's monthly Progress Evaluation of Mentoring Process

Source: Hauptfleisch, 2006.

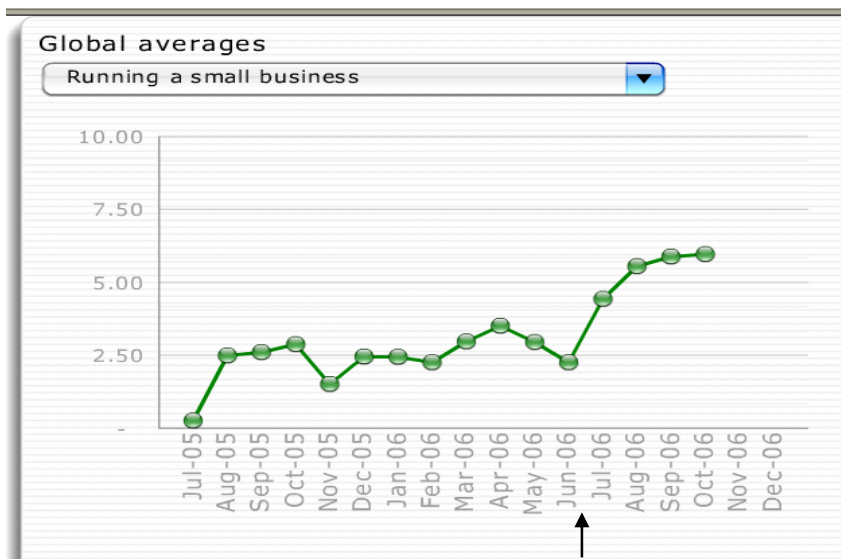
QUANTITATIVE DATA: CSIR DIAGRAMMATIC PRESENTATION AND COMMENTS

All the quantitative data generated during the programme (as discussed above) was submitted to the CSIR for processing. This element of the TQM process is unique and the first of its kind applied in order to continuously track, assess and manage programme outcomes when embarking on the accelerated development of beneficiaries in a learn and earn environment.

The most important outcome of the CSIR Report is that it conclusively shows that it is possible to set standards for all aspects of a development programme, measure the outcomes, assess deviations and take corrective steps based on the measured outcomes (TQM), during the life of the programme. One example of a diagrammatic presentation is shown below in Figure 4, providing a perspective of the overall ability developed by the contractors during the programme (CSIR Close-Out Report, 2007:1-22). Table 1 provides the scoring and ranking scales, as was determined in order to reflect the contractors' ability to manage a small construction business, termed “Running a Small Business-Global Averages.”

Running a Small Business-Global Averages

When viewed across the overall performance for the time under review (see Figure 4), October 2006 represents the highest rating at 59.7% (average, approaching very good performance). When compared to the 24.9% recorded in August 2005, through to June 2006 (being “fair”), the performance regarding this indicator has increased by almost 35 percentage points since the inception of the programme, mainly during the period June 2006 to October 2006. This represents a substantial increase in the ability of contractors to run a small construction business. This fairly dramatic improvement specifically co-incided with the introduction of the Management Development Programme (MDP), requesting mentors to identify knowledge weaknesses and to take steps to rectify it (TQM), underscoring the mentors’ contribution in capacity generation.



Introduction of MDP

Figure 4: Running a Small Business – Global Averages

Source: CSIR, 2007.

Table 1: Scoring and Ranking

Score	Performance
0-20%	Poor performance (contractor is not capable to execute an activity independently)
21-40%	Fair performance
41-60%	Average/good performance (contractor is capable to execute and activity with assistance)
61-80%	Very good performance
81-100%	Excellent performance (contractor is capable to execute activities independently and in a sustainable manner)

Source: CSIR 2007.

FOLLOW-UP SURVEYS

Further fairly comprehensive studies were undertaken, following the official completion of the programme November 2006, in order to obtain a final perspective from the participants, dealing with aspects not contained in the CSIR Report. This survey (Close-out Stakeholder Questionnaires) lead to two further reports, firstly reflecting views of mentors and training providers and secondly the views of the EC's. These reports generally commented favourably on the IECDM. Some of the resultant data, based on inputs obtained from the main beneficiaries of the IECDM, the EC's, is reflected in Sections 1 and 2 below (ECDC, IECDM Close-Out Report, 2007: 19-20).

Section 1 requested the respondents to rate the overall performance of the model. The scoring system utilised was based on a 1-10 rating with:

1-2 = poor, 3-4 = fair, 5-6 = average/good, 7-8 = very good, 9-10 = excellent

- Question 1.1: Rate the overall IECDM programme in terms of delivering on the key objective being enterprise development of emerging contractors.
The average score was 8, thus falling into the range of "very good".
- Question 1.2: Rate the mentoring programme introduced by the project team in terms of value adding beneficiation of the emerging contractor.
The average score was 9.3, thus falling into the range of "excellent".
- Question 1.3: Rate the management of the IECDM by the ECDC appointed project team.
The average score was 8.33, thus falling into the range of "excellent".
- Question 1.4: Have you as the emerging contractor noticed significant growth of your enterprise regarding sustainability and viability as a construction enterprise.
The average score was 8, thus falling into the range of "very good".
- Question 1.5: Rate the CETA learnership in terms of the value adding beneficiation it has provided for the emerging contractor.
The average score was 8.33, thus falling into the range of "excellent". The emerging contractors have indicated a high level of satisfaction with the learnership qualification. This in contradiction of the 6.33 scored for the same element by the mentors. Based on the scores received and the comments, it can be said that although the emerging contractors felt they gained from the learnership the mentors questioned the lack of practical application on site of the modules taught on the learnership.
- Question 1.6: Rate the overall TQM process in terms of the value adding, providing corrective measures and to guide the mentor/emerging contractor /training provider relationship.
The average score was 8.67, thus falling into the range of "excellent".
- Question 1.7: Has the introduction of the Manual guideline document (MSCC) created a sound knowledge base for the mentor/contractor relationship:
The average score was 9, thus falling into the range of "excellent".

Section 2 took into account the business development of the emerging contractors; the response was requested as a yes or no to the question put forward:

- Question 2.1: Asked whether the IECDM had improved the business skills of the emerging contractor to manage their enterprises effectively.
100% responded with "yes". 0% responded with "no".
- Question 2.2: Asked whether the emerging contractor was now in a position to execute projects of larger capacity as a result of the knowledge gained through the IECDM.
100% responded with "yes". 0% responded with "no".
- Question 2.3: Asked whether the emerging contractor was able to tender and compete more efficiently for construction projects post IECDM than prior to the IECDM.
100% responded with "yes". 0% responded with "no".

- Question 2.4: Asked whether the emerging contractor felt the knowledge base regarding the construction industry has been enhanced as a result of their participation in the IECDM. 100% responded with “yes”. 0% responded with “no”

GENERAL COMMENTS REGARDING STATISTICAL DATA

From a purely methodology perspective, it is important to note that the data contained in all the reports represent the *perspectives* of mentors and EC’s. The data contained was not tri-angulated. However, the feedback from mentors and contractors, over a large geographical area, without personal contact with each other, consistently confirmed the same trends, supporting the reliability of the data.

CONCLUSIONS

- The research conducted during the creation and practical implementation of the IECDM (as a holistic integrated programme in practice) and the ensuing results, conclusively showed that the elements contained in the model are vital to achieve successful outcomes resulting from the creation of an enabling environment for emerging (small) contractor development in South Africa.
- The programme has to be rigorously managed. This requires that a competent project manager and management team be appointed to manage the programme on a day-to-day basis.
- **All elements of the programme have to be supported by Total Quality Management processes and managed each step of the way so that corrective action may be taken in time. This is done by way of the programme owner (client) receiving regular progress reports and management action plans, based primarily on quantitative data, supported by qualitative data.**
- An important principle underlying the IECDM is recognition that it is a training programme with the objective of creating sustainable construction businesses. Training has a price tag and satisfactory results are achieved more effectively and efficiently when programmes have the necessary financial resources and the full commitment of all stakeholders.
- Selection criteria should be further developed and applied to identify and select suitable contractors to enter the programme, as well as for training service providers. Minimum standards have to be set and adhered to.
- Financial packages should be obtained for the EC’s from financial institutions that are committed to the programme and the development of contractors. The nature of the programme offers security to a bank that it cannot normally obtain from an emerging contractor operating on his own.
- The IECDM is mentor-based and the appointment of an accredited mentor (accreditation based on construction knowledge and aptitude) is central to the success of the programme. The University of the Free State has such an accreditation programme. The multitude of tasks fulfilled, the constant business development support and the actual training provided by mentors, are extremely important interventions in small construction contractor capacity building in South Africa. Without it there is virtually no chance of success. However, there is also very little hope of achieving sustainable skills development if the entire programme is not subjected to rigorous TQM in order to identify and act upon deviations from stated objectives as soon as it occurs. If data collection, interpretation and managerial action is not instituted to determine what level of development has been reached by the EC’s, the evaluation of proficiency becomes very subjective and thus untrustworthy.

RECOMMENDATIONS

The IECDM requires that a local, regional or national body, with sufficient muscle, undertake the programme. Economy of scale is achieved by implementing the comprehensive programme across a region such as a province. Integrated programmes are remarkably cost effective when conducted on a fairly big scale. Typically organisations such as government departments (Departments of Public Works or Housing), metros, and development corporations are ideal promoters for the model.

Contractors are developed successfully when they have continuous construction work. If possible, contractors on the programme should be provided with term contracts for a minimum period of 24 months. This time scale also synchronises with CETA Learnership requirements.

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