Applying Process Methodology to Environmental Assessment Management

by
Páll R Valdimarsson

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A thesis submitted to the School of Science and Engineering
at Reykjavík University in partial fulfillment
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Abstract

Growing concerns on the sustainability of the earth has encouraged societies to perform better in environmental matters. The impetus and the aim of the research was to examine the possibility of applying Process Methodology to Environmental Assessment Management (EAM). Why? One could say that Project Management (PM) techniques provide powerful tools for planning, implementation and follow-up in projects and by applying this methodology better results in environmental assessment and management could be achieved. Recent researches show that the tendency is to select or develop simpler and simultaneously, more effective methods in Environmental Assessment Management (EAM) and processing Environmental Impact Assessment (EIA). Increased weight is among companies, including construction companies, to implement so-called Environmental Management Systems (EMS), ISO 14001. This effort is consistent in the context of increasingly stringent legislation that foster environmental protection, as well as increased interest in environmental issues. The research is basically qualitative as it tries to explain the participant's experience on matters relating to environmental matters. Participants were 66 municipalities, with 8 firms at the forefront of environmental management and environmental assessment, two in the public sector, five in consultative engineering and one in the construction sector. Questionnaires were sent to these municipalities and firms, followed by 10 interviews with participants from the municipalities involved in environmental matters. Quantitative data was gathered from the answers to the questionnaires (survey) and analysed. The main findings indicate the need to examine closer the methodology of Environmental Assessment Management (EAM) and whether the developing of simpler, more effective and efficient methods for assessing environmental impacts could potentially lead to lower cost. By combining Environmental Impact Assessment (EIA) to Environmental Management Systems (EMS), an integrated EIA/EMS process could be made improving the efficiency of Environmental Assessment Management. By this it is possibility to develop and implement ‘user-friendly ‘methods which municipalities and others would be willing to use.

Key words: Project management (PM); Environmental Assessment Management (EAM); Environmental Management Systems (EMS); Environmental Impact Assessment (EIA).

Úrdráttur

Vaxandi áhyggjur af ástandi jarðarinnar hefur hvatt þjóðfélög til að sinna betur umhverfismálum. Hvatinn að þessarri rannsókn var að skoða möguleikann á því að nýta sér aðferðafræði verkefnisstjórnunar í umhverfisstjórnun. Hvað veldur því að vert sé að velta þessu fyrir sér? Segja má að aðferðir verkefnisstjórnunar leggi fram öflug verkfæri til skipulagningar, framkvæmdar og eftirfylgni í verkefnum. Með því að nota þessa aðferðafræði er hugsanlega hægt að ná betri árangri í umhverfisstjórnun en það er meðal annars markmið þessarar rannsóknar. Erlendar rannsóknir sýna að tilhneiging er til að velja eða þróa einfaldari og á sama tíma markvissari aðferðir í umhverfisstjórnun ásamt þeim aðferðum sem beitt er við mat á umhverfisáhrifum. Aukin þungi er meðal fyrirtækja, þar á meðal verktakafyrirtækja að innleiða umhverfisstjórnunarkerfi, ÍST EN ISO 14001. Þessi viðleitni er í samræmi við sífellt strangari löggjöf sem stuðlar að umhverfisvernd, auk þess sem almennur áhugi á umhverfismálum fer vaxandi. Rannsóknin er í grunnin eigindleg þar sem leitast var við að fá fram upplifun eða skoðun þátttakanda á málefnum sem tengjast umhverfismálum. Þáttakendur í rannsókninni voru 66 sveitarfélög, ásamt 8 fyrirtækjum í fararbroddi í umhverfisstjórnun og umhverfismati. Tvö þessara fyrirtækja eru í opinbera geiranum, fimm ráðgefandi verkfræðistofur og eitt þeirra með stærstu verktakafyrirtækjum á landinu. Sveitarfélögunum 66 ásamt þessum 8 fyrirtækjum var sendur spurningalisti sem fylgt var eftir með 10 viðtölum við valda aðila innan sveitarfélaga sem vinna að umhverfismálum. Meigindleg gögn voru greind frá svörum við útsendum spurningalistum (könnun). Helstu niðurstöður benda til að þörf er á því að skoða nánar aðferðafræði í umhverfisstjórnun og hvort ekki sé möguleiki á því að þróa einfaldari, skilvirkari og árangursríkari aðferðir við mat á umhverfisáhrifum,sem gæti hugsanlega leitt til minni kostnaðar. Til greina kæmi að sameina mat á umhverfisáhrifum einstakra framkvæmda (MÁU) við umhverfisstjónunarkerfi. Ávinningurinn af því væri skilvirkari og árangursríkari umhverfisstjórnun sem myndi síðan skila sér í hagsbótum fyrir almenning. Hægt væri að þróa og innleiða notendavænni aðferðir sem sveitarfélög og aðrir væru tilbúnir til að nota.

Lykilorð: Verkefnisstjórnun; umhverfisstjórnun; umhverfisstjórnunarkerfi; aðferðafræði; mat á umhverfisáhrifum (MÁU).

„If I have seen farther it is by standing on the shoulders of giants“

(Isaac Newton 1642-1727)

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Table of contents

Table of figures

List of tables

1 Introduction

1.1 Introduction to the research

Current practice in assessing what possible positive or negative impacts a proposed project may have on the environment is often not recognized as an important part of projects. It is rather considered as something that will increase cost and create unnecessary problems in planning and executing projects. This attitude towards Environmental Impact Assessment methods is often seen in such environmental reports as ineffectual approaches which can potentially be explained by a weak methodology.

A newly published book predicting how our world could look like in 2050 highlights the problem of climate change, development, globalization and demand on resources (Smith, 2011). True or false, this prediction is not the subject of this research but Smith's final question is: "*What kind of world do we want?*"

This is a fundamental question that has to be asked when alternatives are considered on protecting our living environment. Therefore it is necessary to use a relevant methodology that encourages both individuals and organizations to implement successful Environmental Assessment Management in their procedures.

1.2 Background research

This research project was motivated by a genuine interest in the feasibility of implementing Process Methodology with Environmental Assessment Management. An adaptive approach is needed because of some dissatisfaction with traditional procedures and principles giving an opportunity to seek more effective and realistic alternatives. Charvat (2003) shows us through comparison the advantage of using project methodology, as illustrated in figure 1. (Charvat, 2003:p6)

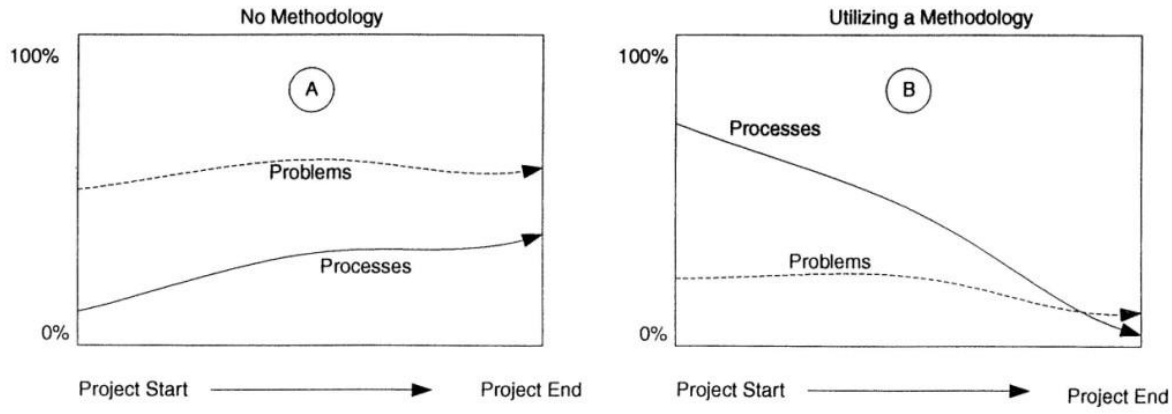

Figure 1 Difference in using a methodology (Charvat, 2003:p6)

In project A no methodology is used and shows that process issues as well as problems actually increase as the project moves along. Project B on the other hand has a structured methodology with a defined and operational project process, minimizing the number of problems that may occur in the project (Charvat, 2003).

But what brings out the thought of integrating Project Management methodology with Environmental Assessment Management? We tend to look at The Pyramid of Giza, the Coliseum, and the Transcontinental Railroad as great architectural and engineering works but overlook Project Management methodology, and yet its core principles were used extensively in these projects. Project Management has evolved over the past 4,500 years. It shows that modern Project Management practices did not begin 100 years ago but have been used for thousands of years (Holland, 2011). The methodology to assess environmental impacts, EIA and Environmental Management Systems (EMS) is historically speaking much younger. The development of methods and techniques in Project Management is more mature and provides a powerful set of tools to improve the ability to plan, implement and manage activities to accomplish specific organizational objectives. But Project Management is more than just a set of tools. It is a result-oriented management style that places a premium on building collaborative relationships among a diverse cast of characters (Larson & Gray 2011). In light of those words it is important to recognize the obvious advantages of using this methodology in Environmental Assessment Management (EAM). The ideal solution might be to have a

singular methodology for all projects from beginning to end. This of course would be difficult to attain but any effort to simplify existing methods are worth considering.

1.3 Research statement

In the coming years the sustainability of the environment will be the main focus in discussions among both public and governments (Harris et.al., 2006, page.36). The public voice will increase the pressure on policy-makers to lower the priority of private interests, instead giving the environment a higher priority and the benefit of doubt. It is therefore important that organisations (e.g. construction sector as well) develop their methodology in Environmental Assessment Management in a more simple, efficient and transparent way for the benefit of the general public.

1.4 Research aim and objectives

The aim of the research is to improve Environmental Assessment Management. To achieve this, the methods currently used in Project Management shall be assessed and the application of those methods to Environmental Assessment Management evaluated. The intention is to compare current methods of Environmental Assessment Management to what is considered the best practice in Process Methodology. If there seem to be shortcomings in current procedures, a recommendation will be made by suggesting improvements to the current practice in Project Management methods.

1.5 Research questions

Four research questions have been formulated hopefully revealing certain underlying and undesirable practices of municipalities and others when it comes to handling environmental issues. The questions relate to current practices and to find out if they could be improved by using a different methodology.

The four research questions are:

1. How well are responsible parties aware of current methods in Environmental Assessment Management?
2. Why do responsible parties consider environmental issues of less importance than other aspects?
3. Are environmental assessment methods similar between projects?
4. How is it possible to apply Process Methodology to Environmental Assessment Management?

1.6 Research justification

What justifies this research is the emphasis on environmental issues in current debates. Though the subject of research is to solve problem that is not always the case. The current review procedures relating to certain matters are equally important to see if improvements are needed or not. In environmental issues it is sensible to review the methodology to see if Environmental Assessment performance is adequate (Holling, 2005).

Questions can arise:

a) To what extent, and under what circumstances, do present methods not provide predictions of impacts?

b) Is a gap between technical impact assessment studies and actual environmental planning and decision making?

c) What if our understanding of the nature and behaviour of ecological systems does not reflect in the environmental assessment?

1.7 Definitions

Throughout this research the following definitions will be adhered to. The terms described below are potentially interpretive differently and therefore worthy of a clarification of their usage in the context of this research.

Methodology: is a set of guidelines or principles that can be tailored and applied to a specific situation. In a project environment, these guidelines might be a list of things to do. A

methodology could also be a specific approach, templates, forms, and even checklists used over the project life cycle. (Charvat, 2003)

Environmental impact: any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization´s environmental aspect. (ISO14001:2004)

Environmental Management System (EMS): part of an organization´s management system used to develop and implement its environmental policy and manage its environmental aspects. (ISO14001:2004)

Environmental aspect: element of an organization´s activities or products or services that can interact with the environment. (ISO14001:2004)

Environmental performance: measurable results of an organization´s management of its environmental aspects. (ISO14001:2004)

Responsible parties: municipalities and public and private firms related to this research that use environmental impact assessment and publish environmental reports.

2 Literature review

2.1 Introduction

There is increasing pressure on municipalities and firms (e.g. those in the construction sector) from various sources to engage in environmental management initiatives. In the past, government regulations have been the major initial environmental factors, but today the community and market have become the dominant ones playing increasingly active roles in environmental issues. It is necessary to refine techniques and methodologies to improve quality in environmental assessment and management. Rigorous analysis, responsive consultation and responsible administration are the ´three Rs´ that have been identified as a cornerstone in achieving quality (Singleton et.al., 1999). To achieve this one should focus on the possibility of applying Process Methodology to Environmental Assessment Management.

The importance of good or relevant Process Methodology cannot be understated. Not only will it improve quality and performance during project execution but it will also allow for better customer relations and confidence (Kerzner, 2010).

2.2 Relationship between subject matter

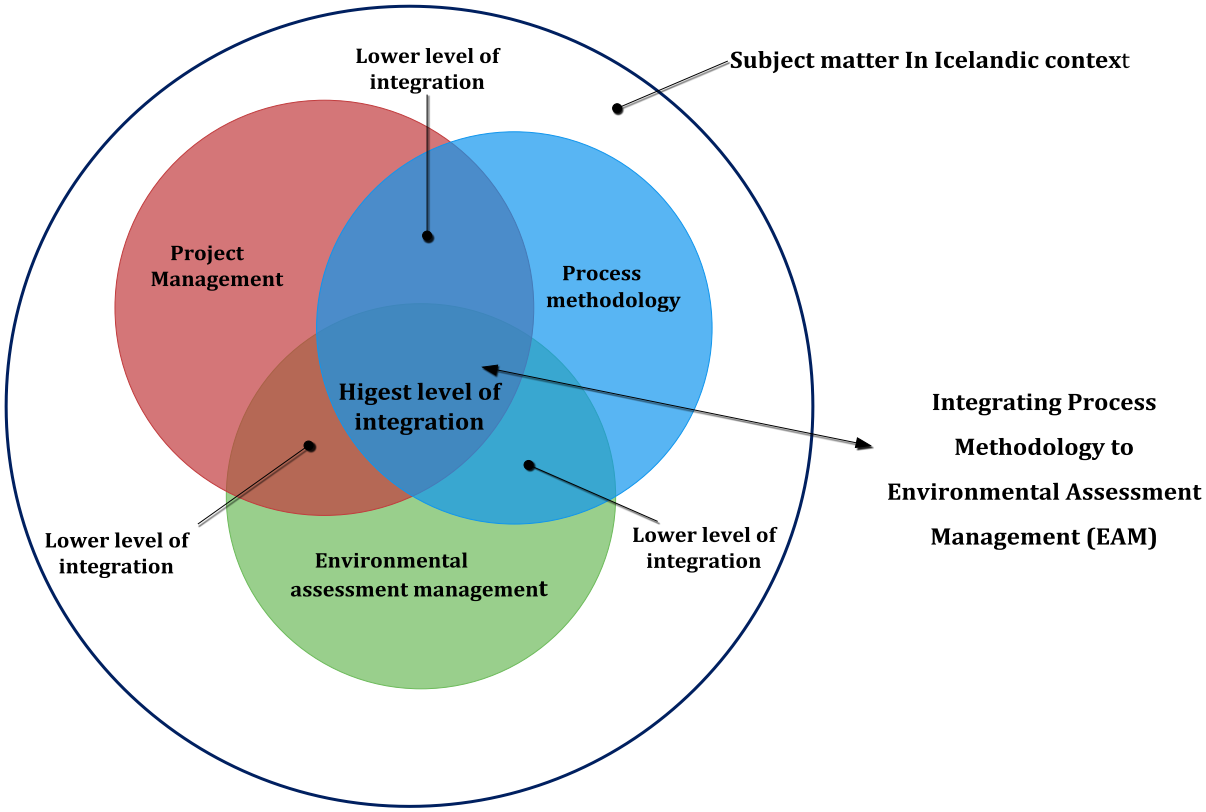

Figure 2 Process of the literature review

2.3 Highest level of integration

On the journey to the highest level of integration there appears to be a gap in theoretical literature. To fill that gap it is necessary to approach that level by exploring various definitions found in recent and diverse literature in the lower level of integration (figure 2) which is:

i) Project Management perspective on Environmental Assessment Management;

ii) An Environment Assessment Management perspective on Project Management

iii) A Process Methodology perspective on Project Management [and Environmental Assessment Management]

iv) A Project Management perspective on Process Methodology

v) A Process Methodology perspective on Environmental Assessment Management and

vi) An Environmental Assessment Management perspective on Process Methodology.

There is a large amount of literature on the field of Process Methodology and Environmental Assessment Management however that is not the main concern in this thesis, but rather to find evidence of the need to integrate these fields. This research will extend the theoretical literature on integration between those two processes which so far has been limited to a managerial perspective.

2.3.1 Development of Project Management (PM)

There are some indications that the lower level of integration between Project Management (including construction Project Management) and Process Methodology, that Project Management has evolved from a set of familiar processes to a more structured methodology considered mandatory for the survival of the firm. Companies' entire business activities can be regarded as a series of projects. Simply stated the companies' business is managed by projects. Today Project Management is regarded both as a Project Management process and a business process, which means that project managers are expected to make business decisions as well as project decisions. The importance of integrated processes (Kerzner, 2010: p249), especially quality, has become part of all project management methodologies. (Kerzner, 2010). Therefore researches show a trend to develop and expand the Project Management and processes methodologies to be more incorporated and at the same time by the need for capturing and retaining the best practice, leading to the understanding that the best practice should be a continuous improvement process (Engwall, 2003; Maylor, 2001; Cole, 2000; Lu & Wilson, 2011). Thus it can be said that to strive for the highest level of integration is not an unrealistic goal using the lower levels of integration, especially between Process Methodology and Environmental Assessment Management. The literature in this field shows a gap in knowledge which this study will somewhat attempt to fill.

2.3.2 Dynamic Environmental Impact Assessment (E+)

The starting point of this literature review is a paper written by Wagner (2007) where he analyses the association of the integration of environmental matters and other managerial processes. He states that Environmental Management (EM) is in many cases not integrated with other core managerial processes which can lead to a lack of consistency. This disconnection can than lead to a limited economic efficiency and low ecological effectiveness. Possibly a hidden value can be in integrating environmental management with the core function of a firm. A shift has taken place in the existing literature from asking ”does it“ to ”when and how does it“ to pay to be green by addressing processess such as integration that simultaneously influence environmental management activities and economic performance (King et.al., 2001). There are indications that more and more firms integrate environmental management with other core processes of the firm (Buysse & Verbeke, 2003).

Boiral (2006) states that integration can reduce organisational failure. In this respect a strong practice trend can be seen towards integration of different quality and environmental management systems such as ISO 9001 and ISO 14001. The integration of environmental topics with other processes in the firm brings not only beneficial costs but should improve performance (Wagner, 2007). Chen et.al. (2004, 2005) are interested in making environmental issues a greater part of the construction sector. Their approach is to create a methodology E+ (Chen et al., 2004: p623). Basically, it is implementing dynamic Environmental Impact Assessment (EIA) which integrates practicable Environmental Management (EM) approaches into the Environmental Management System (EMS), an ISO 14001 process throughout the whole construction project cycle. The base for his suggestions is that Environmental Impact Assessment tools do not suite the promotion of Environmental Management. Current Environmental Impact Assessment methods cannot accommodate all the issues and concerns in construction, and in projects generally, where the need is for Environmental Assessment Management (EAM). Chen concludes that weaknesses in Environmental Impact Assessment can be overcome by this dynamic environmental impact assessment process (E+). There is a need for a developed methodology that measures the advance environmental impacts of projects, a method that is more effective than EMS and EIA. The ultimate purpose of developing current methods is in this case to come up with an integrated methodology to improve environmental performance in the life cycle of a project.

2.3.3 Environmental assessment tools and methods

Dialogues on environmental issues has been increasing since 1990 when companies including the building sector, began recognise the environmental impact of their activities, (Haapio et.al, 2008) and the need for a yardstick that could measure environmental performance towards reducing environmental impacts (Crawley & Aho, 1999).

Haapio (2008) states that even though the field of environmental assessment tools are both vast and internationally well known the literature concerning the structure and content of the tools is limited. The tools have been developed for different needs and purposes and a comparison of them and their results is difficult. A vision of transforming the existing building environmental assessment tools into sustainability assessment tools seem, at the moment, distant. The scale of resource use and ecological impacts associated with buildings is widely acknowledged (Rees, 1999). Cole (2000) declares that most assessment methods focus only on environmental performance. Environmental assessment methods are not consistent and comprehensive. There are quite a few advantages of practicing environmental responsibility in the construction sector. Among those are:

a) Improved opportunities to tender
b) Less money wasted on fines
c) Less money restoring environmental damage
d) Less money lost through wasted resources
e) Improved environmental profile

The main reasons for scant inclusion of environmental issues within assessment methods is a general lack of understanding of the range and type of environmental issues in the construction Project Management process. Building environmental assessment methods offer the advantages of detailed structuring environmental criteria, identifying and communicating the range of relevant issues and their relative significance. (Pasquire, 1999). Cole (2003) goes on to state that environmental concern is greater now than before. The changing nature of environmental problems requires different approaches to address them. There is a tendency to follow only the standard regulations which can lead firms not to deal with the underlying problem. Although regulations will remain important, more innovative measures are needed to address emerging environmental problems which are more dispersed and global in nature. Future assessment methods should shift from ”green“ assessment to

"sustainability" assessment. The debate in the construction sector will be between technical performance and environmental performance. By focusing on implementing Environmental Assessment Management firms fear increasing cost despite powerful arguments on the importance of environmental issues and evidence of great benefits. It is necessary to look at the entire picture. In the short run there could be an increase in cost but in the long term there could be substantial gain. In time, many environmental considerations will undoubtedly be incorporated as standard practice. The question is how environmental assessment methods will evolve in the future:

a) Assessment methods will have to be cast within a broader array of mechanisms for creating necessary change
b) Accounting for possible synergies or integration between environmental performance criteria
c) Environmental assessment methods will have to be recast under the umbrella of sustainability
d) Environmental assessment methods will have to reinvent themselves to maintain potency.

There is no doubt that building environmental assessment methods have contributed to furthering the promotion of higher environmental expectations in the construction sector. But while current environmental assessment methods are being expected to fulfil multiple roles, it remains uncertain whether they can retain this potency (Cole,2005).

Ridgway (2005) suggests small changes can be made on Environmental Impact Assessment (EIA) so it can be used in Environmental Management System (EMS). Streamlining the links between Environmental Impact Assessment (EIA) and Environmental Management System (EMS) can be achieved simply and successfully. The difference between Environmental Impact Assessment (EIA) and Environmental Management System (EMS) is basically that EIA is usually imposed by local regulations but not closely related to day to day internal operations within an organization like EMS, aiming to minimize the risk of unforeseen environmental impacts. In the early planning phase of a project (Ridgway, 2005:p327), it is the risk identification and assessment tools of the Environmental Impact Assessment process that are of most value. Once an Environmental Impact Assessment approval is in hand and the project moves on through the development cycle the usefulness of

the Environmental Impact Assessment (EIA) and its output gradually decreases and Environmental Management system (EMS) becomes more important. An opportunity is to enhance the effectiveness of the implementation of Environmental Impact Assessment (EIA) and to improve the delivery of its commitments through the use of environmental management systems (EMS). In practice the links between Environmental Impact Assessment (EIA) and Environmental Management System (EMS) can be made quite simple and when implemented they will offer:

a) a cost-effective approach
b) a logical and systematic approach that will fulfil environmental expectations of regulators and the public.

2.3.4 Integrated EIA/EMS process

Eccleston (2011) describes complementary benefits that exist between an Environmental Management System (EMS) and Environmental Impact Assessment (EIA). He goes further and provides the basis for integrated EMS/EIA/sustainable development process (Eccleston, 2011:p253). He discusses the complementary nature, the similarities and the difference between the EIA and EMS process. EIA and EMS and the goal of sustainable development provide three separate and independent approaches for protecting the environment.

> "*The EIA process provides a scientifically based process for rigorously and objectively evaluating alternatives to a proposal or plan. In contrast, an EMS provides an ideal system for implementing and monitoring the EIA plan and final decisions. A detailed assessment of these two processes demonstrates that both systems share many common features, and that the weaknesses of one process frequently tend to be counter-balanced by the strengths of the other. Properly combined, an integrated EIA/EMS provides an efficient mechanism for evaluating and implementing agency actions*".(Eccleston, 2011, page.239)

Eccleston (2011) goes further by suggesting expanding upon earlier systems that use an integrated EIA/EMS. The advantage of integrated process is that it draws from the synergistic strengths of EIA/EMS to identify, plan, evaluate, and implement sustainable measures.

2.3.5 Unexpected events and environmental impacts

Söderholm (2008) places a focus on an interesting subject which is to look at unexpected events and environmental impact. He suggests that when dealing with unexpected events the best practice models of Project Management are not normally included. The unpredictability and randomness of project environments are kept aside and project managements are mostly concerned with internal issues. Project Management models fully illuminate the project itself while leaving the environmental somewhat hidden in darkness. Investigating the relations between project execution and the project environment is being an increasingly more interesting issue. The environment has become a greater topic when moving from major one-off projects to frequent and regular project operations. It is recognized in traditional Project Management literature that environmental relations need management attention but the more complex they become, the ability to foresee events and plan worsens accordingly. This is also made a topic of research to a greater extend today than what used to be the case (Engwall, 2003; Söderlund, 2004; Besner & Hobbs, 2006; Weck, 2005; Ford & Bhargav, 2006; Jensen et.al., 2006). Literature reviews also suggesting this as a desired topic to investigate more thoroughly. Söderholm's contribution is to enquire into the links between a project and its environment. He sees unexpected events appearing in projects as a consequence of environmental impact and should be dealt with accordingly. Traditional and normative project management models are highly rational and sequential in the approach to Project Management issues but not valid descriptions on Project Management in practice. Approaching projects from a practice perspective indicates the necessity to highlight actual activities, processes and actions of those who execute projects. The issue on project environmental relations is one of the aspects of Project Management practices that have been shielded behind rational models and planning approaches, thus not giving the complexity of project environmental practices the attention it deserves. Project environments are depicted in terms of stakeholder relations, risk assessment, program and portfolio contingencies and stage-gate decision points. Less interest is given to the everyday struggle to keep projects on track and on schedule and not much is conveyed in terms of how the unexpected is dealt with. A project is to some extent truly ambiguous and filled with unexpected events created as things do not unfold as planned or because conditions change over time. Projects have to be

considered as being contextually dependent and continuously contingent on environmental relations. Söderholm (2008) further states that there is a need for:

a) Innovative action
b) Extensive meeting schedules and short term coordination
c) Detachment strategies to isolate the consequences of revision as much as possible
d) Negotiation skills and projects safe guarding. He concludes that it is important that environmental issues keys in with project work during execution, through re-openings, revisions and fine-tuning.

There is concern on how to improve construction practices in order to minimise their detrimental effects on the natural environment (Cole, 1999), but Ding (2008) points out that little or no concern has been given to the importance of selecting more environmentally friendly designs during the project appraisal stage, the stage when environmental matters are best incorporated. Using a single method to assess a building´s environmental performance and to satisfy all needs of users is no easy task. Therefore an ideal environmental building assessment will include all the requirements of the different parties involved in the development. Some of the assessment methods are single-dimensional when the multifaceted building sustainability needs a multi-dimensional approach. He lays out the work of a multi-criteria model (Ding, 2008:p460) for appraising projects at the feasibility stage that should include environmental issues in the decision-making process. However the interaction between building construction and the environment is still largely unknown. Current environment assessment methods do not adequately and readily consider environmental effects in a single tool and therefore do not assist in the overall assessment of sustainable development. Construction is one of the largest end users of environmental resources and one of the largest polluters of manmade and natural environments. The improvement in the performance of buildings with regard to the environment will indeed encourage greater environmental responsibility and place greater value on the welfare of future generations. Existing environmental building assessment methods have their limitations that reduce their effectiveness and usefulness. There is a requirement for greater communication and interaction. Certainly sustainable development is an important issue in project decisions. A significant and growing number of studies have attempted to examine the environmental outcomes of Environmental Management Systems (EMS). There is this dialogue about

whether the purpose of ISO 14001, which is to help improve environmental performance, is being fulfilled. The results in the growing body of literature are inconclusive. The reason for this mixed conclusion is:

a) There is no agreement on what environmental performance is or how to measure it
b) There is neither clarity nor agreement on how or why Environmental Management Systems (EMS) are expected to aid performance.

It is necessary to define not just performance but what is meant by improvement. Thus one needs to focus not only on the question if there is a strong correlation between implementation of the Environmental Management Systems (EMS) and improved environmental performance, but more on how the environmental performance is defined.

2.3.6 Environmental performance

The outcome of Environmental Management Systems (EMS) is determined by the scope of that system; that is to say, it is context dependent. Environmental issues as observed in businesses have an interdisciplinary character. They cut across different sciences and cover different methodologies. Environmental performance is quite a diverse process that depends on what tools are applied and what assumptions and decisions are made. (Nawrocka & Parker, 2009). Lam et.al. (2011) state that in spite of Environmental Management Systems (EMS) being widely used in the construction industry there is room for improvement. As an important component of project management, green specifications should be able to compensate for some of the intrinsic weaknesses of Environmental Management Systems.

An interesting focus is stated by Persson (2006) where he is looking at the connection between environmental assessment methods and conflict. Generally, most environmental evaluations focus on a set of environmental parameters assumed to be effected by plan or project. The main problem is that the focus on parameters obscures stakeholder´s interests and conflict and hinders creative problem solving. He suggests that an environmental assessment will be linked to values and interests of those who are involved. We have to accept that society consists of people with different interest and values which inevitably lead to numerous conflicts. Therefore it is necessary to develop creative problem solving to find:

a) common gains
b) a win/win solution
c) environmental compensations

d) central environmental values.

Tam et.al. (2007) state that there is growing pressure for all project participants to extend their traditional business objectives of not only lowering cost and shortening project duration, but also to improve environmental performance. Gaps in communications among project participants present barriers to the improvement of environmental performance in construction Project Management. Tam et.al. (2007) further state that the demand for a significant amount of time and cost investment for improving environmental performance decreases the contractor's interest in doing so. Contractors are often more concerned with short-term interest, not long-term potential benefits (Zhang & Shen, 2000). Construction project performance has traditionally been measured in terms of time, cost and quality. Lately environment has been considered the fourth dimension (Shen & Zhang, 1999). Gangolells's study (2009) suggests that construction has been slow to adopt environmental performance evaluations like ISO 14031, and that there have been few studies on integrating aspects of environmental management in the construction planning stage in particular. Gangolell et.al. (2009) further state that only 2% of all papers on environmental management in construction provide quantitative methods. Of the papers providing such methods the most noteworthy are (Tam et.al., 2004; Cheung et.al., 2004; Shen et.al., 2005; Li et.al., 2006; Claver et.al. 2007) which try to clarify the relationship between environmental management and economic performance by integrating it into a wider framework that includes the relationship between environmental strategy and firm performance.

Only a few decades ago many managers saw environment and enterprise as antagonistic terms. Integrating the environment into the organisation represents an opportunity for the firm in terms of competitiveness. Many studies on improvements in environmental quality or performance exist. The majority of them try to change the attitude that environment and business is not a good combination but can benefit each other. Rondinelli & Vastag (2000) state that ISO 14001 does not ensure legal compliance and continued performance improvement. Scrase & Sheate (2002) suggest that the best way is to increase integrated approaches in Environmental Assessment Management (EAM). Shen & Tam (2002) state that pressure is increasing to adopt proper methods to improve environmental performance across all industries, including construction. Khan et.al. (2002) conclude that an environmental commitment of an organisation will become a market strategy. Huang & Chang (2003) state

that techniques and tools applied to environmental management are not effective enough. Forsberg & Malmborg (2004) state that with the rising interest and demand from policy makers to achieve a sustainable society, the need for environmentally related information is increasing, as is the interest in environmental assessment of the built environment. Shen et.al. (2005) state that it is important that the level of the environmental performance in implementing construction activities can be properly measured and communicated to the public and project participants. Lee (2006) places a focus on the differences between research and other technical contributions intended to strengthen assessment methodologies. Zhang (2008) states that there is increasing pressure put on firms to engage in environmental initiatives. El-Halwagi et.al. (2009) , Wu (2009) and Nikolaou & Evangelinos (2010) emphasise the importance of that last statement as well.

2.4 Summary

There is a growing trend to integrate various managerial processes including Environmental Assessment Management (EAM). The literature review has revealed different approaches to that task but the question is how far one should go beyond official rules and regulations. Most firms follow the policy of fulfilling only minimum requirements instead of going all the way and tightly-knit environmental issues to their core business. There is a need for not only following required rules and regulations but going beyond them based on knowledge and understanding of environmental matters, leading to better decision making.

Environmental Impact Assessment (EIA) can be likened to input and Environmental Management System (EMS) output producing integrated EIA / EMS process or E+. Process Methodology can be described as a process of major activities which transform an input into an output. There is a growing pressure or potential for synergistic integration of Process Methodology and Environmental Assessment Management. Existing literature shows that current environmental assessment methods are not sufficient. There is a need to go beyond current practice. Environmental issues are at the centre of a growing public debate and there is a demand for more responsible firms that integrate environmental aspects in their plans and strategies. This is not just an option anymore: it is a life dilemma for the organisations to be able to survive. A significant amount of literature exists on studies placed at the lower level of integration, growing enormously from the year 2000. This could be interpreted as a desire to reach for the highest level of integration (figure 2).

3 Research Methodology

3.1 Research method

It is important to select methods and strategies suitable to the research to acquire answers and to achieve the research´s aim and objectives. Without considering available options regarding limitations the research could be meaningless. As in the process of creating research questions the selection of the strategies and methods was reviewed as the project progressed. This was considered in order due to the nature of this project. The main strategy was to use a descriptive case study (see section 3.2) in the form of a questionnaire to acquire a deeper understanding on current practices in environmental assessment and management in all the Icelandic municipalities and some private firms.

Through the questionnaire the hope was to demonstrate a certain tendency (or trend) in the current practices in Environmental Assessment Management that could be followed up by case study interviews, so called focus interviews (Yin, 2009, p:107). The interviews would then be focused on particular themes based on the subject matter of the research, that is to say, the interviews would lead the subject to certain themes instead of establishing specific opinions about those themes. The interviews would be conducted in a semi-structured manner based on an interview guide (Kvala & Brinkmann, 2009). By using a qualitative approach to this research gives an opportunity to reach much deeper into matters making it possible to answer the research questions more accurately. Following this procedures, assumptions could be drawn on whether a certain methodological approach towards Environmental Assessment Management is lacking or adequate.

3.1.1 Research framework

The basis for the framework is the research questions. Answers to these questions will then hopefully lead to what is this research desires to accomplish (figure 3).

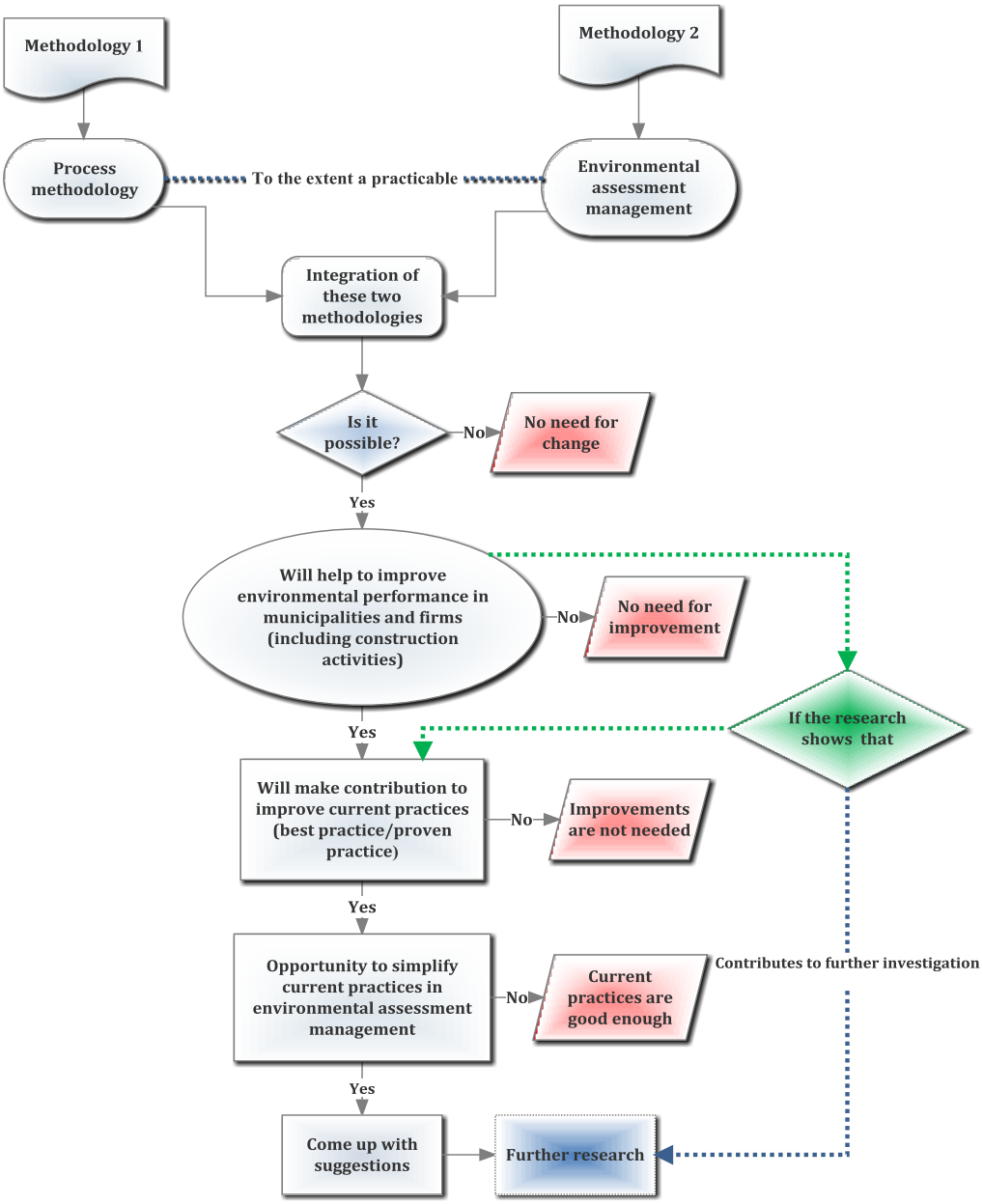

Figure 3 Research framework

3.2 Research strategy

The research strategy is based on a well-established practice (Fellows & Liu, 2008). In this particular research the path that will be taken is of a so called descriptive case study (Yin, 2009), followed by questionnaire and interviews (Kvale & Brinkmann, 2009). This is illustrated in figure 4. The nature of this research is basically a qualitative approach which was the main deciding factor when choosing the appropriate research strategy. This research aims to identify how a system works, determine what may be done better, find results and possible improvements if necessary and lastly to make recommendations for further research.

3.2.1 Research program

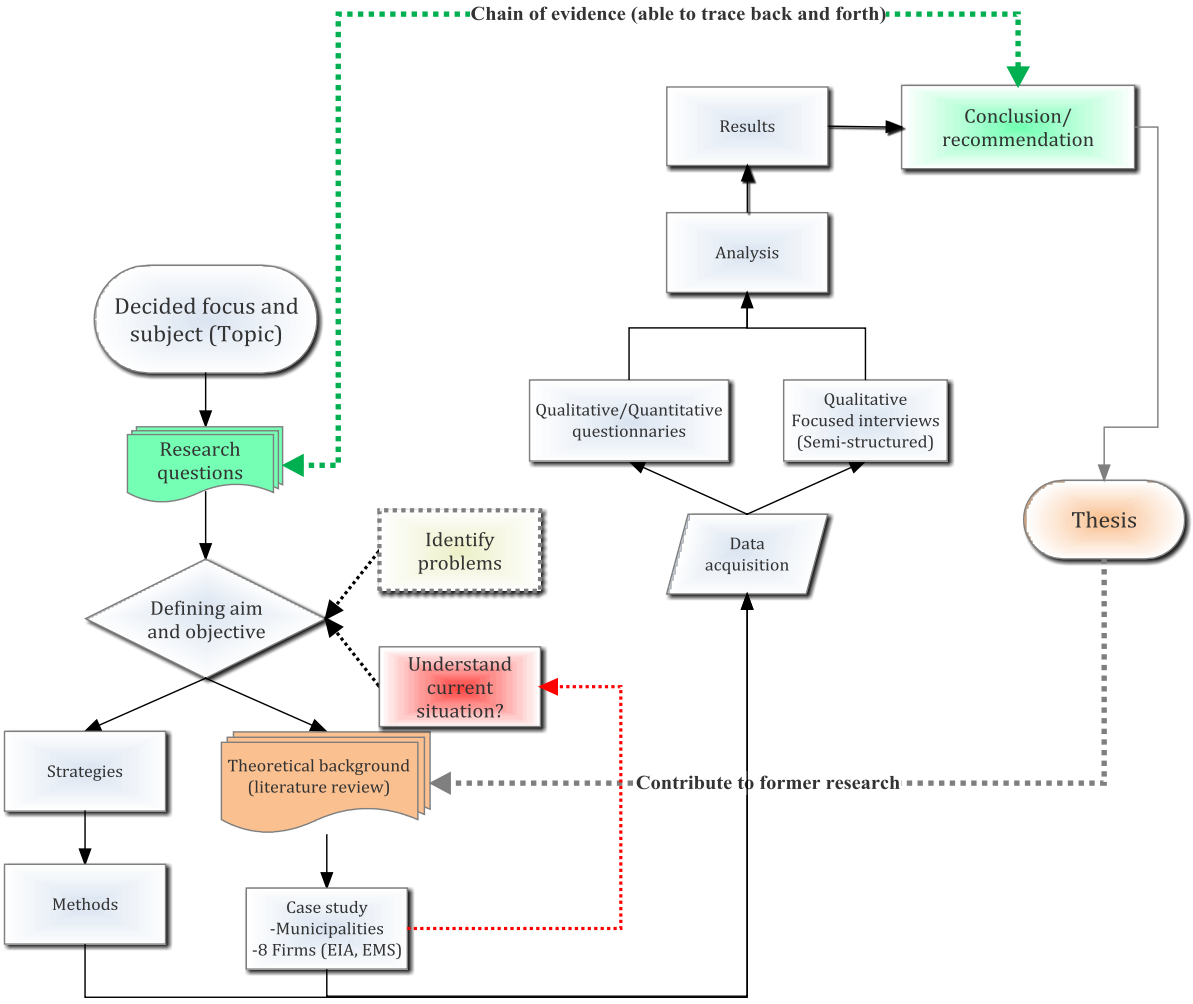

Figure 4 Overview of research program

3.3 Quality of research design

3.3.1 Construct validity

The nature of this research is similar to an empirical social research. As case studies are one form of such a research it is important to judge the quality of the research design according to certain logical tests. The problem is to develop a sufficiently operational set of measurements instead of only subjective judgements to collect data. However, to reduce the risk of this as much as possible a multiple source of data is gathered. (Yin, 2009)

3.3.1.1 Internal validity

This concludes how much it is able to state that answers from the questionnaire really did answer the questions that were asked. Did the matters which the questionnaire was to bring forth shine through. To establish internal validity a phone call was placed to all municipalities to take part in the research before they received the actual questionnaire. The reason being to get as many to answer the questions as possible to increase accuracy. The larger the sample is, the more accurate the estimates from the research will be.

3.3.1.2 External validity

As the research has a qualitative approach it is difficult to see whether the research findings are generalizable beyond the immediate case study. In analytical generalization the aim is to generalize a particular set of results to a broader quantitatively theory but in this research external validity is not obtained in the same way. By getting data from as many municipalities as possible and from the private firms helped to increase external validity. By using more than one method in this research external validity is strengthened.

3.3.1.3 Reliability

Using a multiple methods approach (collecting data from more than one participant, using questionnaires and interviews) increases the reliability of the research.

3.4 Limitations of methodology

No pilot questionnaire was carried out to be able to revise some questions but the interviews will be used to correct bias. A focus will be on those questions that create new ones to deepen further knowledge and understanding on those aspects they were meant to shed a light on. However the draft questionnaire was pre-tested by the company[1] that conducted it. This company read through the draft questionnaire and provided constructive comments on wording, clearness, simplicity, unambiguousness and the length of the questionnaire. The sample of firms in the research is much smaller than the sample of municipalities. Therefore the accuracy of the data from firms is not as high as data from municipalities limiting the comparison of them and reducing the value of the results. However it gives certain indications.

3.5 Ethical issues

In this research acknowledge will be on three basic ethical principles (Fellows & Liu, 2008).

- The principle of respect for autonomy which is basically respect for persons and their independence to exercise their free self-will to decide whether to participate in the research.
- The principle of beneficence refers to whether the research shall be beneficial for people and respecting person´s decisions.
- The principle of justice which basically refers to the selection of the participants and selection of data sources on the basis of their relationship with the subject matter.

[1] Outcome CMS SYSTEM-professional conculting company that conduct surveys

4 Data collection and analysis

4.1 The Case Study of municipalities and firms

The questionnaire was sent to participants in all municipalities and firms that working in the field of Environmental Impact Assessment (EIA) and have implemented the Environmental Management System (EMS)-ISO 14001. All the questions in the questionnaire can be seen in appendix A.

4.1.1 Questionnaire survey for municipalities

There are 75 municipalities in Iceland (figure 5). A bigger map can be seen in appendix E.

Figure 5 Municipalities in Iceland (National Land Survey of Iceland, 2012)

In the preparation phase of the questionnaire survey a one on one telephone call was placed in January 2012 to all participants. The questionnaire was conducted in February 2012 with 66

municipalities and 8 firms, 2 from the public sector and 6 from the private sector. At the beginning of March 2012, 48 out of 66 municipalities had answered the questionnaire, a return rate of 72,73%. The municipalities received the questionnaire by e-mail with the help of a company in that field of work [2].The questionnaire was activated 28.2.2012 and sent to 66 e-mail addresses[3], resent 5.3.2012 to 36 e-mail addresses and finally sent the third time 7.3.2012 to 28 e-mail addresses[4]].

4.1.2 Questionnaire for firms

The questionnaire that the firms received was slightly different from the one sent to the municipalities. The municipalities received a questionnaire by e-mail but the firms a printed one by post in the middle of March 2012. At the end of Mars 2012 6 out of the 8 firms had answered the questionnaire survey, a return rate of 75%.

4.2 Research participants

4.2.1 Profile of the municipalities answering the questionnaire

On behalf of the municipalities various civil servants answered the questionnaire , see table 1 and figure 6:

Table 1 What is your job title? (municipalities)

Job title/municipalities	Percentage (%)	Number of
Municipality manager/ that approves building permissions	6.38	3
Director of environmental department	6.38	3
Environmental manager	14.89	7
Other	72.34	34

Most of those who answered the questionnaire were professionals. However some were not professionals in environmental issues but in other fields as can be seen in table 2 and figure 7:

[2] Outcome survey system (SMC SYSTEM) – Outcome software
[3] See appendix G
[4] Only sent to those participants that did not responded at that time

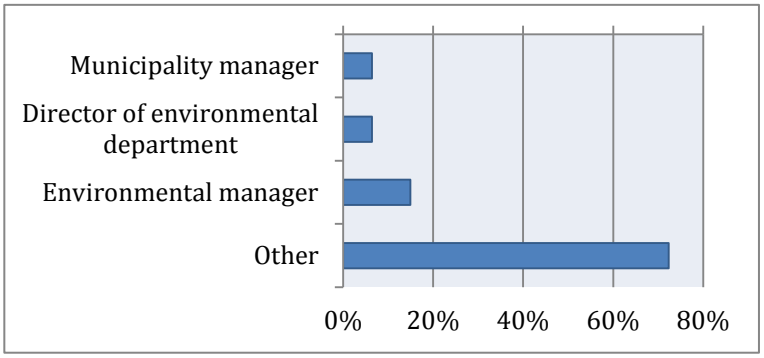

Figure 6 Job title / municipalities

Table 2 What is your specialisation? (municipalities)

Specialisation/municipalities	Percentage (%)	Number of
Environmental issues	39.58	19
Project management	25.0	12
Construction management	50.0	24
Other	22.92	11

This gives a total amount of 66, as participants could choose more than one option in the questionnaire. Other specialties were in architectural technology and construction management, accounting, administration, planning and construction matters, specialisation in nature and protected areas.

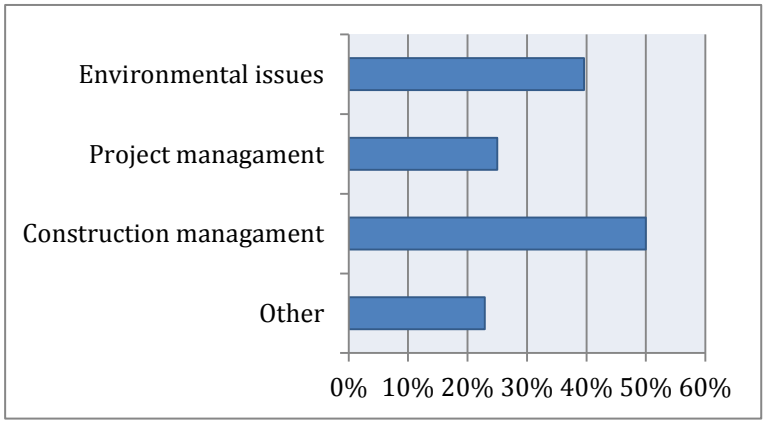

Figure 7 Specialisation / municipalities

4.2.2 Profile of firms answering questionnaire

The questionnaire was sent to 8 firms, 2 of which are public and 6 private.

1. Landsvirkjun (state hydro/electrical company).
2. Orkuveita Reykjavíkur (a municipality owned geothermal company)
3. Mannvit (engineering consulting firm)
4. Ístak (leading construction company in Iceland)
5. VSÓ (engineering consulting firm)
6. Verkís (engineering consulting firm)
7. Almenna verkfræðistofan (consulting engineers)
8. Efla (consulting engineers)

The job title of the representatives answering the questionnaire was as follows (see table 3 and figure 8):

Table 3 What is your job title? (firms)

Job title/firms	Percentage (%)	Number of
Civil engineers	33.3	2
Environmental scientist	50.0	3
Other	16.7	1

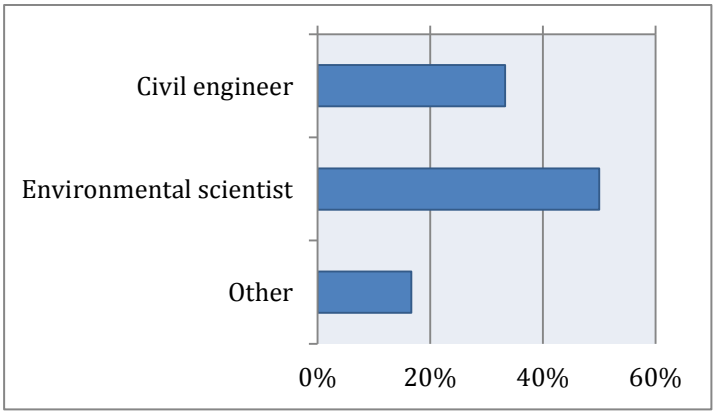

Figure 8 Job title / firms

All those firms are well known in Iceland with a good reputation in their field of work. Landsvirkjun and OR are both firms that are familiar with the EIA process and have already implemented ISO 14001(EMS). The six other firms have a good understanding on the EIA process and write environmental reports for other companies in their projects and 5 out of 6 have implemented Environmental Management System (EMS).

4.3 Data analysis procedures

The questionnaires were built up in such a way that it would not take long for participants to answer, only approx. 5-10 minutes. The experience of these questionnaires is that the longer it takes to answer the questions and more the specific they are the participants will lose interest and the response rate drops.

To get a complete picture of the status of environmental issues in Iceland, all municipalities were included in the sample population. After completion of the questionnaire survey, all the basic data[5] obtained was analysed further (section 4.3.1 and 4.3.2). This was due to the nature of the questions and to get the whole picture for those who study the research.

4.3.1 Data analysis from municipalities

The questionnaire was divided into four parts:

(A-1) General information.

(B-1) Aspects related to Project Management (PM)-managerial process.

(C-1) Aspects related to Environmental Assessment (EA).

(D-1) Aspects related to integration of Project Management (PM) to Environmental Assessment Management (EAM).

4.3.1.1 First part (A-1)

The first four questions were general, asking about gender, age, job title and specialisation. The gender of municipal participants were 69% male and 31% female, see figure 9, in the age range mainly 35-49 years old, 47.92% (23), see figure 10.

The fifth general question shows a high interest in environmental issues both in municipalities and firms. The job title and specialisation do not change that picture in general.

[5] See further in appendix B and C

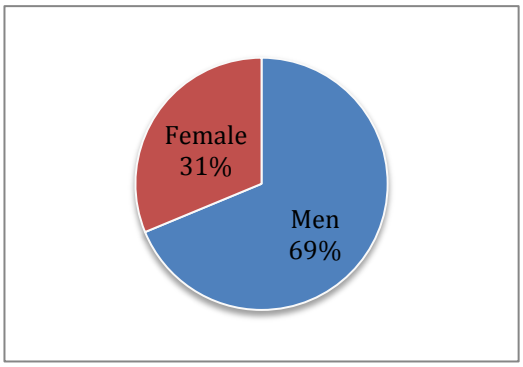

Figure 9 Gender / municipalities

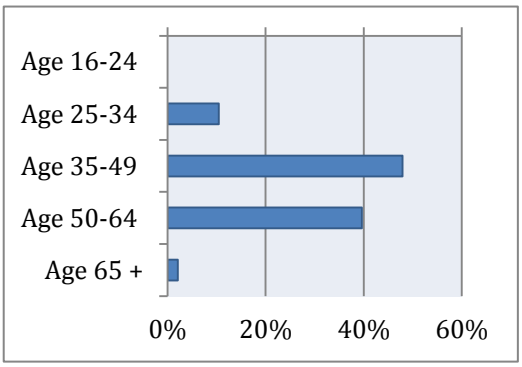

Figure 10 Age range / municipalities

4.3.1.2 *Second part (B-1)*

Question 6, shows the participants understanding of standard Project Management (PM) on a scale of 1-10[6] lies in the range of 7 to 8 (figure 11). This is a relatively high score, yet not surprising. Three participants scored 9 (6.52%) and 4 persons 10 (8.70%). Those that have specialisation related to Project Management (PM) and Environmental Assessment Management (EAM) are expected to know traditional Project Management methodology. On the other hand relatively many participants are listed under another job title or specialisation consider themselves to have a good understanding on Project Management methodology as well.

In question 7 participants were asked how important they thought the need to use traditional methodology of Project Management (PM) in their field of work. An overwhelming majority consider traditional methodology in Project Management important, 82.61% (figure 12).

[6] 1= very low understanding and 10= very high understanding

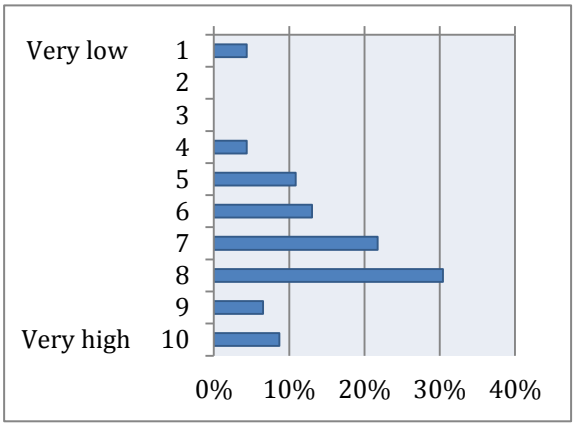

Figure 11 Understanding PM-methodology, (municipalities)

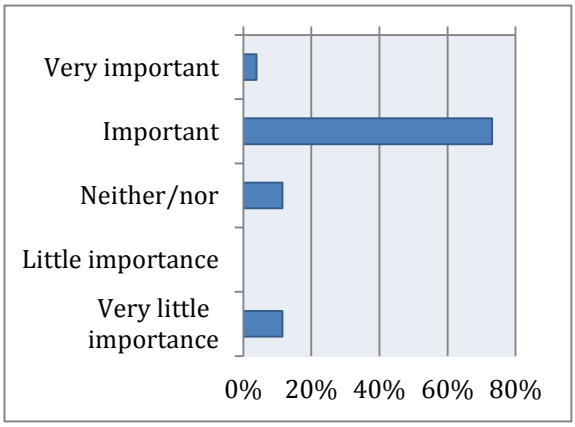

Figure 12 Importance of PM-methodology, (municipalities)

In question 8 participants indicate their agreement or disagreement on chosen statements. This is done to better understand how aware the participants in the municipality are towards Project Management methods. Interesting things can be seen from the answers perhaps pointing towards a certain trend that can help answer the research questions.
Firstly, according to the statement:

Traditional project management methods can be used in environmental assessment management,

85% of participants are in agreement, and 15% were neutral (‘neither/nor’ category).
Secondly, according to the statement:

An extra focus is needed on the impact individual environmental factors can have (positive or negative) on a project before construction permit is granted,

64% of participants are in agreement with 32% neutral (‘neither/nor’ category) and 4% in disagreement.
Thirdly, according to statement:

Too much cost is one of the main reason that Environmental Impact Assessment (EIA) is not a very big issue in the managerial process,

54% of participants are in agreement, 32% neutral (‘neither/nor’ category) and 11% disagree (figure 13).

Figure 13 First eight statements in the questionnaire (municipalities)

These three answers indicate that there is a justifiable reason to look into what has been said earlier in this research, to go beyond current practices and strive for the highest level of integration between Process Methodology and Environmental Assessment Management. At the very least there is a reason to look into whether there is a need for further development of current methods in Environmental Management or Environmental Assessment Management. Other answers to the statements in question 8 could be foreseen.

4.3.1.3 *Third part (C-1)*

Part three (C-1) in the questionnaire focuses on aspects related to Environmental Assessment (EA) or Environmental Assessment Management (EAM). The first question in that part which is question 9 can be related to question 5 in part (A-1) where interest in environmental issues was rated high, 89.58%[7]. Here the focus is on how important

[7] In category ‚very much' 43.75% and in the category ‚much' 45.83%

environmental issues have in the municipality on a scale of 1-10[8]. The result puts the municipalities relatively high on that scale, 7 out of 10 which is 31.91% (15) and 10 representatives (21.28%) place it on a scale of 8 and 9 with one participant giving environmental issues the highest score or 10.

Question 10 asks the participants how aware they were of the scope of Environmental Management (EM), (see table 4 and figure 14):

Table 4 How much are you aware of the scope of EM in your municipality?

Alternatives/municipalities	Percentage (%)	Number of
Very much aware	20.83	10
Much aware	60.42	29
Neither/nor	14.58	7
Little aware	2.08	1
Very little aware	2.08	1

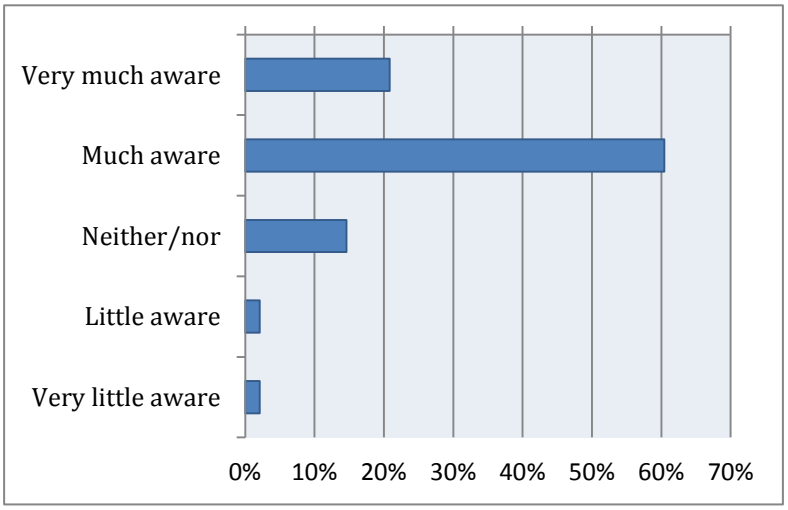

Figure 14 Awareness of EM-scope in the municipalities (municipalities)

This awareness shows a growing interest in environmental issues and therefore an opportunity to place more emphasis on those issues. However, when the results of question 11 are examined, surprisingly most the municipalities have not implemented the Environmental Management System (EMS)[9] a total of 42 out of 48 or 87.50%. This score would have been

[8] 1=very low importance and 10= very high importance
[9] ISO 14001: international standard that specifies requirements for Environmental Management Systems (EMS)

better if all 66 participants had answered this question, as the results are not in line with answers from question 10, where local councils are highly aware of the scope of Environmental Management (EM) in their municipalities. The results are somewhat more in line with what was discussed in the literature review on these matters and confirm doubts on recent researches carried out on how effective and important the Environmental Management System (EMS) is indeed. There were also differences of opinion among many scholars whether it is necessary for municipalities to implement Environmental Management Systems (EMS) to the same extent as firms do. For those municipality participants who answered 'yes' in the questionnaire as to whether they had implemented ISO 14001, had to further respond to two statements (question 11a) . The first one stated that ISO 14001 has improved environmental performance which was strongly agreed on, and the other stated that ISO 14001 has solved all problems concerning environmental issues. This statement was strongly disagreed on. 31 Municipalities responded negatively to question 11[10]. All those participants that were asked (question 11b) to give a reason for why they had not implemented environmental management system (EMS) in their municipalities can be grouped into seven categories:

1) Not appropriate
2) Unknown reasons
3) Lack of interest/lack of ambition
4) No time to do it/no discussion been conducted
5) Too small municipalities
6) Implementation too costly
7) Lack of knowledge
8) No legal obligation (regulations).

Finally the answers to five statements in question 12 were not unexpected and can been seen in figure 15.

[10] Has your municipality implemented ISO:14001, international standard that specifies requirements for Environmental Management Systems (EMS) ?

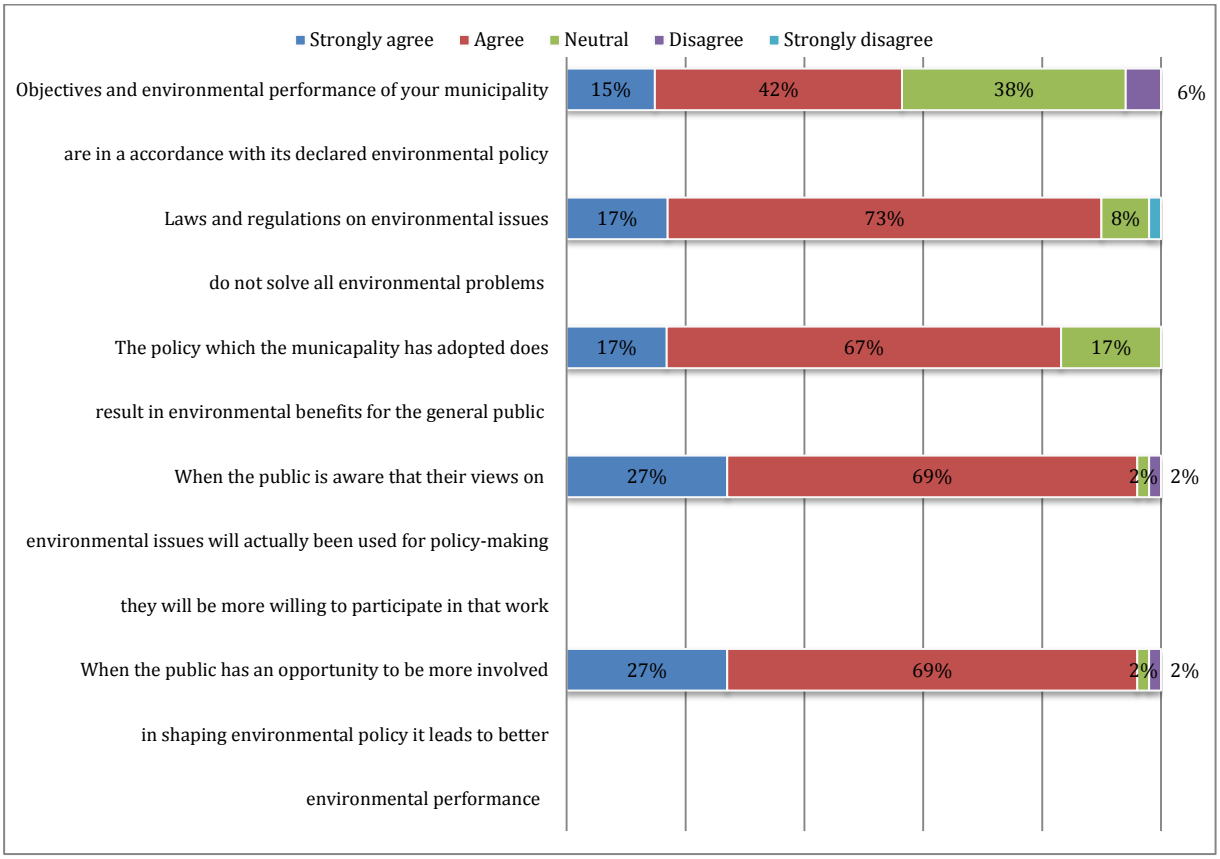

Figure 15 Five statements in question 12 (municipalities)

4.3.1.4 *Fourth part (D-1)*

The fourth and last part (D-1) relates to the integration of Project Management (PM) to Environmental Assessment Management (EAM) and attempting to dig deeper into the participant's opinions on certain matters. In question 13 participants were asked to indicate there agreement/disagreement on eight statements (figure 16). Two statements stand out and could confirm a desired trend which has been mentioned before in previous chapters.

Firstly, *the decision process of assessing environmental impacts is a too complex and comprehensive process.*

The result from the questionnaire showed that 50% of those who answered were in agreement, 39% neutral (‘neither/nor’ category) and 11% disagreed.

This could indicate some shortcomings in current procedures in Environmental Assessment Management.

Secondly, *implementing more simple process in assessing environmental impacts will lead to better environmental performance*, supports the former statement that

improvements are needed. Answers showed that 74% were in agreement, 22% neutral ('neither/nor' category) and only 4% disagreed. Other answers to the remaining statements support the idea of striving for highest level of integration between Process Methodology and Environmental Assessment Management.

Figure 16 Eight statements in question 13 (municipalities)

Question 14 is probably one of the most interesting or important question in the questionnaire, especially in light of the first eight statements in question 13. Answers to question 14 should support the need to improve current practice in Environmental Assessment Management and to go beyond or exceed minimum requirements or regulation and develop easy to use methods that all related parties will accept.

Unfortunately the result from this question is not as decisive as was hoped for. In the questionnaire there were four different alternatives participants could choose from. They were not constricted to answer only one alternative, but could choose more than one option. (see table 5 and figure 17):

Table 5 Why is EAM not more integrated to basic factors of PM?

Alternative/municipalities	Percentage (%)	Number of
Not customary	22.22	10
Not necessary	6.67	3
Too much trouble	31.11	14
Increase cost	13.33	6
Don´t know	42.22	19

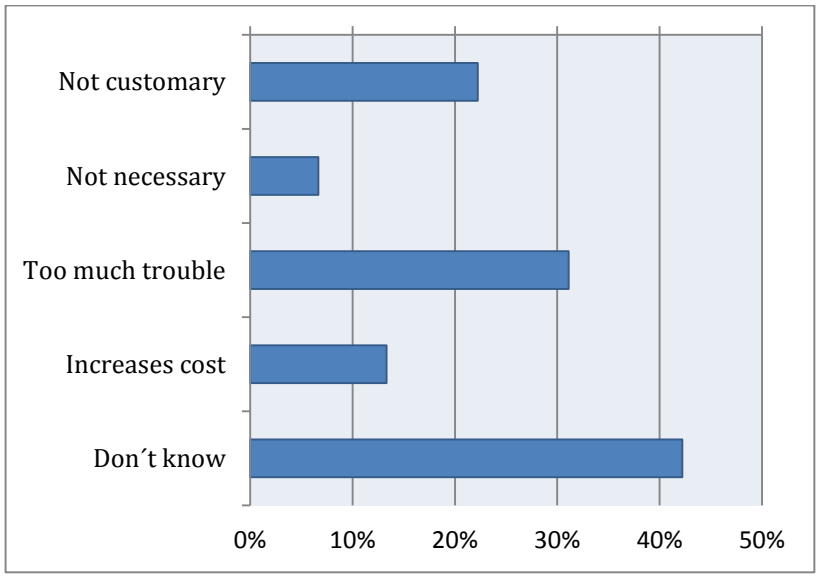

Figure 17 Integrate EM and PM ? (municipalities)

The data shows that too many participants that should have knowledge on Project Management (PM) and Environmental Management (EM) are in the, 'don´t know' category. As can be expected many professional participants in other fields fall into the same category. The reason for this could be that the question was not formulated satisfactorily or not sufficiently clear. This was remedied in the focus interviews with some of the participants in the questionnaire. The last question was in many ways an interesting one and it could be

debated if it should not have been asked earlier in the questionnaire. As in question 14, participants were allowed to check-mark more than one option. The answers show that the majority of those who took part think that communications to stakeholders and planning will be best suited to improve methodology in Environmental Assessment Management. Measuring performance is in third place and fourth is schedules (table 6 and figure 18).

Table 6 What aspects of PM do you think could best improve methodology in EAM?

Alternatives/municipalities	Percentage (%)	Number of
Communication with stakeholders	48.94	23
Planning	46.81	22
Cost calculations	17.02	8
Measuring performance	44.68	21
Schedules	36.17	17
Other	6.38	3

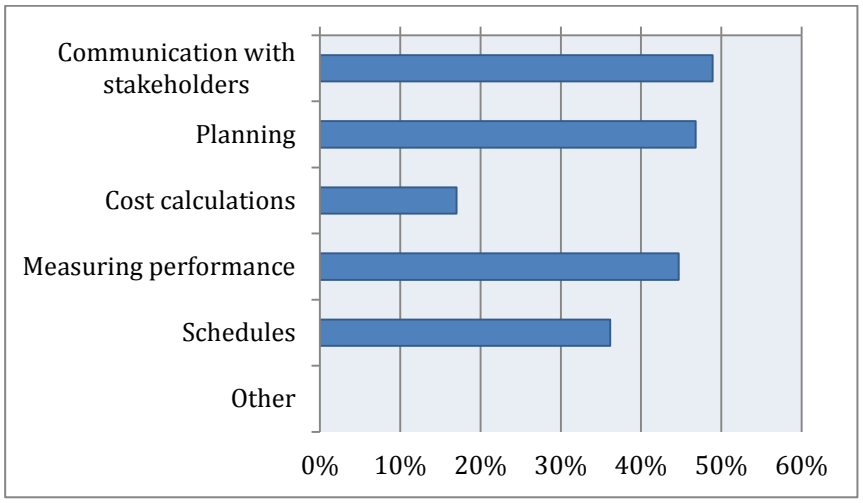

Figure 18 Can PM method improve EAM? (municipalities)

Only 17.02% mentioned cost calculations which is interesting in light of how important this is in traditional Project Management and can be seen in public projects in Iceland where it is more a rule than an exception to overrun the budget.

Three participants mentioned other things (6.38 %) which were; *we are located in a small municipality and therefore not properly looked into what is involved in traditional Project Management, it is used unconsciously, the values of local people should be taken more into account instead of some bureaucrats in Reykjavík making all the big decisions* and finally an interesting comment which is worth considering and could be part of doing things differently in environmental assessment as this research is trying to do. One participant claims that: *it is more effective to undertake research on the nature and Environmental Assessment (EA) much sooner in the process instead of an Environmental Impact Assessment (EIA) since the cost of such an assessment is the responsibility of the project owner and usually it is too late to turn back from the disruption or destruction of nature.*

4.3.2 Data analysis from firms

Unlike participants in municipalities all participants[11] in firms have a specialisation in environmental issues showing somewhat different results. The data is from firms that are in the forefront of the firms that focus on environmental issues. The firms questionnaire survey was divided similarly into four parts:

(A-2) General information.

(B-2) Aspects related to Project Management (PM)-managerial process .

(C-2) Aspects related to Environmental Assessment (EA).

(D-2) Aspects related to integration of Project Management (PM) to Environmental Assessment Management (EAM).

4.3.2.1 First part (A-2)

The gender of the representatives were male 67% (4) and female 33% (2) (figure 19) and 4 out of 6 in the age group 50-64 years old , 66.7% (figure 20).

Answers from the fifth general question show that interest in environmental issues measured very much, 66.7% (4) and much, 33.3%(2). The specialisation of participants in firms were all in environmental assessment matters, 100% (6). Job title of participants was seen earlier in figure 8 (page 25).

[11] Note: Much smaller sample in firms than in municipalities were conducted, therefore the accuracy is less, confidence intervals could be high (+/- %)

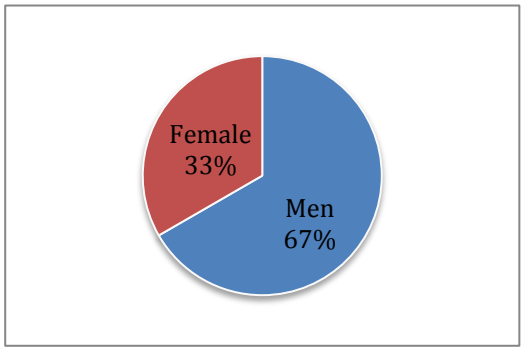

Figure 19 Gender / firms

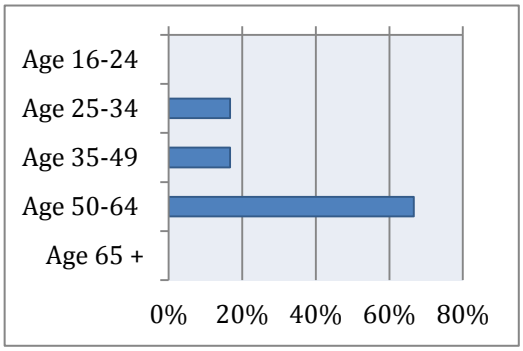

Figure 20 Age range / firms

4.3.2.2 Second part (B-2)

The results from the second part (B-2) come from questions 6, 7 and 8. Question 6 shows that the participants understanding of standard project management on a scale of 1-10 lies in the range of 7 to 9 where 4 out of 6 participants score 8 (figure 21).

In question 7 participants were asked how important they thought the need was to use traditional methodology of Project Management in their field of work. All of them agreed that it was important (100%).

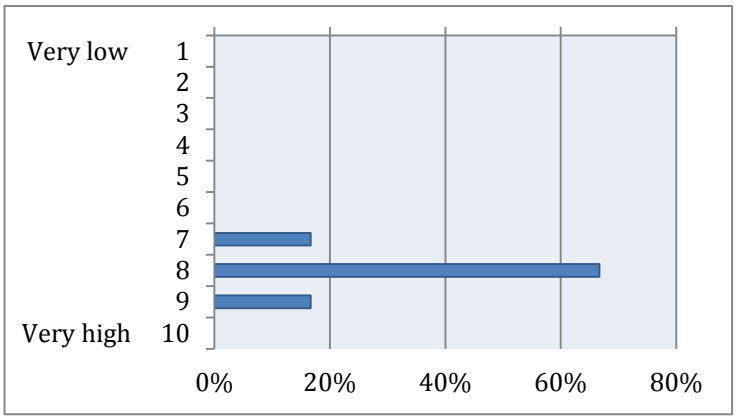

Figure 21 Understanding PM-methodology on a scale of 1-10 (firms)

In answers to question 8 the participants indicate their agreement or disagreement to certain statements. As before a certain trend can be seen from the answers that can help to interpret or answer the research questions. (Further confirmation)

Firstly, according to the statement:

Traditional project management methods can be used in Environmental Assessment Management, all participants were in agreement.

Secondly, according to the statement:

An extra focus is needed on what impact individual environmental factors can have (positive or negative) on a project before a construction permit is granted,

60% of participants are in agreement, 40% are neutral ('neither/nor' category) with no one disagreeing.

Thirdly, according to the statement:

Too much cost is one of the main reason that Environmental Impact Assessment (EIA) is not a very big part of the managerial process,

16.7% of participants are neutral ('neither/nor' category) and 83.3% in disagreement .

The result from these three statements are not completely in line with the result from the questionnaire sent to the municipalities where in the third statement, views on cost are opposite to the views in the municipalities which will be further discussed further in section 5.1.1.[12] However it is still a question of whether there is a need for further development of current methods in Environmental Assessment Management. Other statements in question 8 do not give unexpected results.

4.3.2.3 *Third part (C-2)*

Question 9 relates to question 5 in part (A-2) as in the questionnaire to municipalities. This question 9 is broader, as it focuses on measuring the importance environmental issues have in general in the society on a scale of 1-10[13], putting the society relatively high on that scale or 6-7 out of 10. This indicates that there is an opportunity to get the public more involved in the debate on environmental issues and policy-decision makers can use this positive attitude to increase performance and efficiency in environmental issues.

[12] One obvios reason for this difference could be: This is one source for their income
[13] 1=very low importance and 10= very high importance

Answers to question 10 show to what extend the participants in each firm were aware of the scope of Environmental Management (EM) in the municipalities. (see table 8 and figure 22):

Table 7 How much are you aware of the scope of EM in the municipalities?

Alternatives/firms	Percentage (%)	Number of
Very much aware	16.7	1
Much aware	66.7	4
Neither/nor	16.7	1
Little aware	0	0
Very little aware	0	0

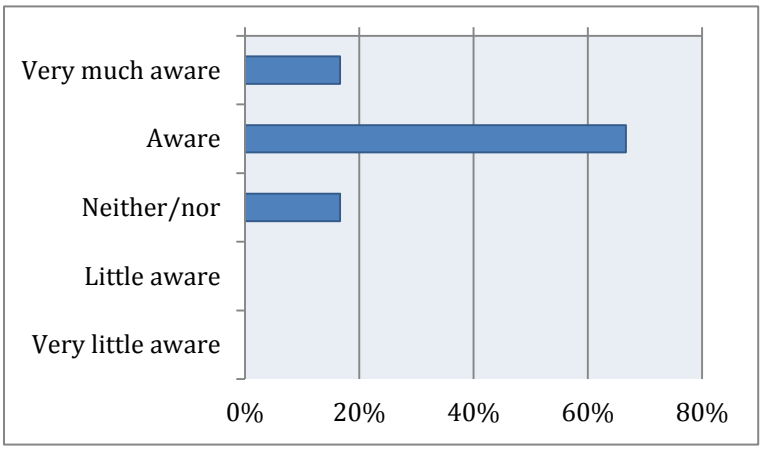

Figure 22 Awareness of EM scope in municipalities (firms)

High awareness is registered at 83.40%. This shows again a growing interest in environmental issues and therefore an opportunity to place more emphasis on those issues then has been done before.

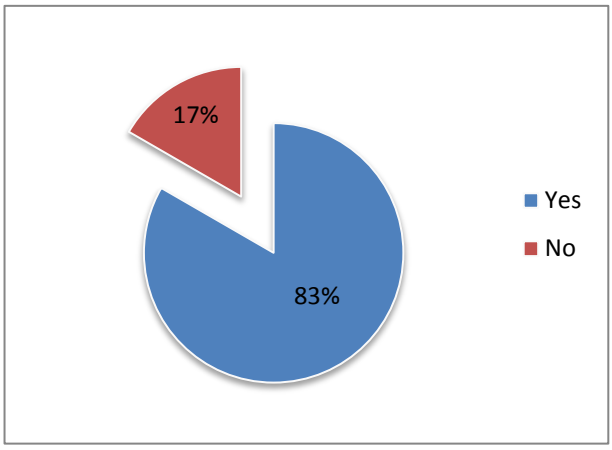

Figure 23 Percentage of firms having EMS

Specialists in the firms working in the field of Environmental Assessment (EA) should have good knowledge on the scope of Environmental Management (EM) in the municipalities. As was expected the answers from question 11 from the firms are the opposite to the answers from municipalities, where 5 out of 6 firms (83.3%) have implemented environmental management systems (EMS) (see figure 23).

In recent years it has been an on-going trend in firms, including construction and engineering firms to connect their operations to Environmental Management Systems (EMS). The literature review[14] confirms that growing approach among firms. Therefore many studies focus on the possibility of the integration of different methods to improve performance and effectiveness of the Environmental Assessment Management. Those firms that answered 'yes' in question 11, had to further respond to two statements in question 11a.

The first one stated that ISO 14001 had improved environmental performance which was 'strongly agreed' on (20%) and 'agreed' (80%). The second stated that ISO 14001 had solved all problems concerning environmental issues in the firm. This statement was 'strongly disagreed' on (20%) and 'disagreed' on (60%). Neutral ('neither/nor' category) were 20%. This is in line with results from other researches or reports about Environmental Management Systems (EMS).

Finally in question 12 the answers to five statements can been seen in figure 24. They were not unexpected apart from the first statement which is opposite to the answers from the municipalities, 50% disagree and 50% neutral ('neither/nor' category) while in the

[14] Chapter 2

municipalities 57% where in agreement, 38% neutral (‘neither/nor’ category) and 6% in disagreement. A possible explanation is that these two parties are looking at this statement from a different angle, representatives of municipalities say ‘yes’, but the ones from firms are undecided.

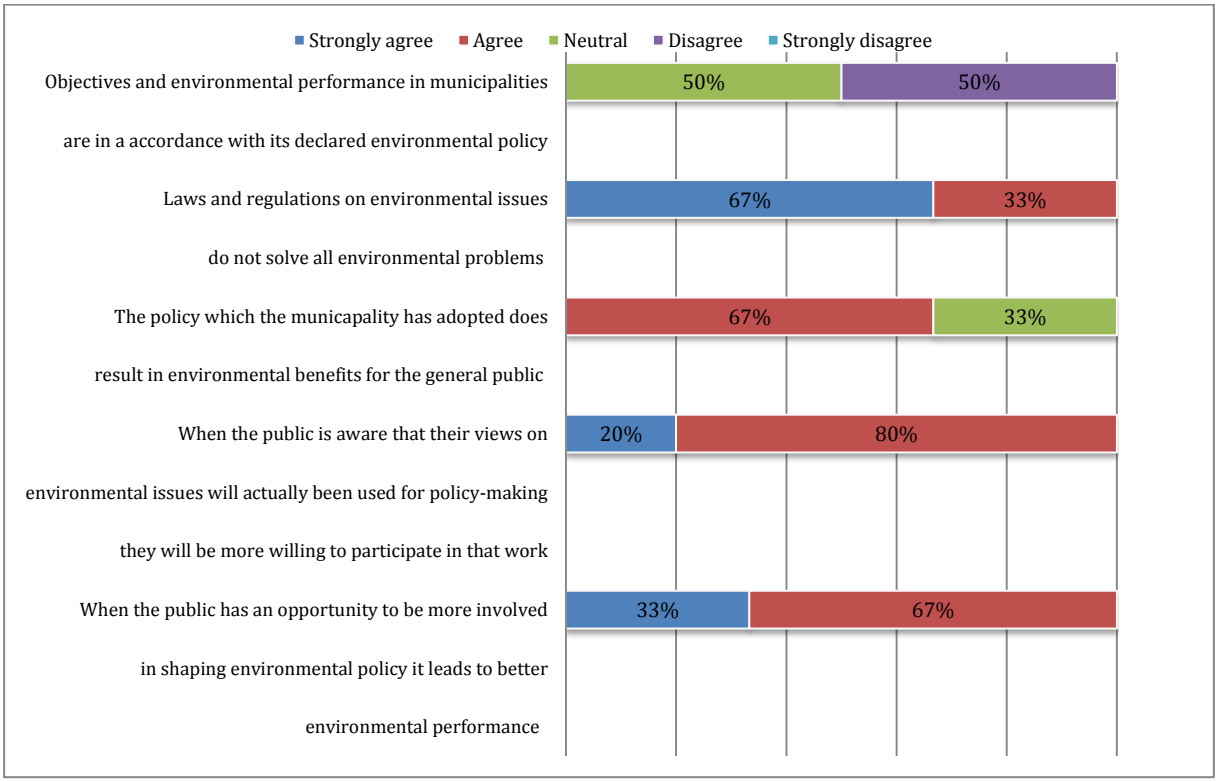

Figure 24 five statements in question 12 (firms)

4.3.2.4 *Fourth part (D-2)*

The fourth and last part (D-2) in the questionnaire relates to the integration of Project Management (PM) and Environmental Assessment Management (EAM). Participants were first asked to indicate there agreement/disagreement with eight statements as before (figure 25). The two statements that were focused on in the municipalities give a different result than in the firms. Firstly,

the decision process of assessing environmental impact is a too complex and comprehensive process.

Answers from the questionnaire shows that 50% were in disagreement and 50 % neutral (‘neither/nor’ category). This indicates that the professionals in Environmental Assessment think current procedures are good enough and the need for improvement is not

necessary. If this is true the questions arise whether professionals believe that current methodology in Environmental Assessment fulfils all requirements relating to environmental issues? Secondly,

implementing a simpler process in assessing environmental impacts will lead to a better environmental performance

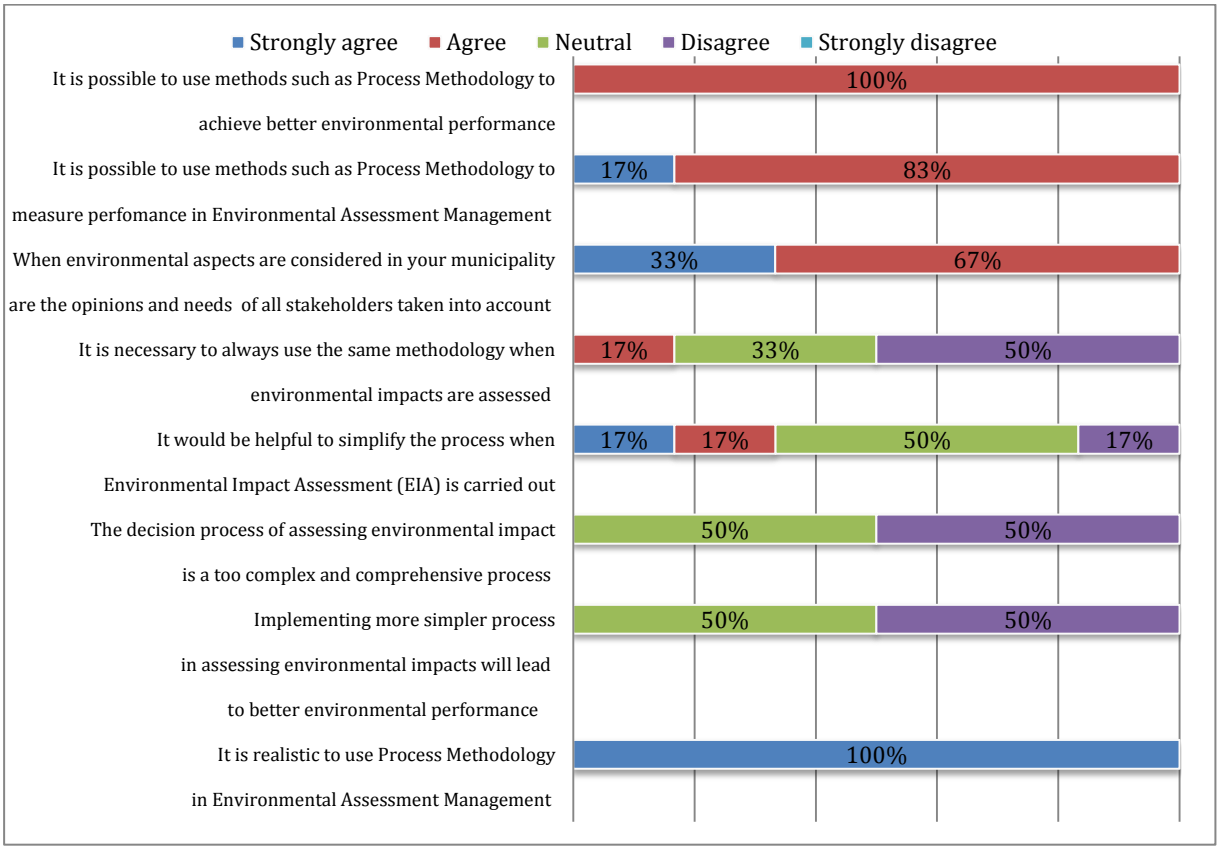

Figure 25 Eight statements in question 13 (firms)

The result from the questionnaire is that 50% of those who answered were in disagreement, 50% neutral (‘neither/nor’ category). The fifth statement is only directed to the firms,

It would be helpful to simplify the process when Environmental Impact Assessment (EIA) is carried out.

The answers to this statement is that 34% are in agreement, 50% neutral (‘neither/nor’ category) and 17% disagree. Even though professionals are not eager to change current procedures in Environmental Assessment Management like the former two statements show they would not stand against improvements if they were available. Other statements support

the idea of striving for the highest level of integration between Process Methodology and Environmental Assessment Management and confirm the result from municipalities.

Question 14 is perhaps the most important question in the questionnaire as has been said before. The objective was to try to find indications that would show the need not only to improve current practices in Environmental Assessment Management but reach beyond minimum regulation requirements and develop easy to use methods all related parties could accept. Unfortunately the result from this question was unsatisfactory, similar to the result from the municipalities. In this case there were different alternatives that participants could choose from as before (see table 8 and figure 26):

Table 8 Why is EAM not more integrated to basic factors of PM?

Alternative/firms	Percentage (%)	Number of
Not customary	14.3	1
Not necessary	0.0	0
Too much trouble	0.0	0
Increase cost	0.0	0
Don´t know	57.1	4
Other[15]	28.6	2

Participants were allowed to check-mark more than one option. The data shows that 4 out of 6 participants are found in the, 'don´t know' category and 2 in the category 'other'. Only one states that it is 'not customary'. This result confirms perhaps what has been stated before in section 4.3.1 that this question is not formulated satisfactorily or not sufficiently clear.

In the last question participants were again allowed to check-mark more than one option. The answers show that the majority think that measuring performance and planning

[15] Ignorance, lack of knowledge, little understanding

will be best suited to improve methodology in Environmental Assessment Management, see table 9 and figure 27.

Table 9 What aspects of PM do you think could best improve methodology in EAM?

Alternatives/firms	Percentage (%)	Number of
Communication with stakeholders	7.7	1
Planning	23.1	3
Cost calculations	7.7	1
Measuring performance	30.8	4
Schedules	15.4	2
Other	15.4	2

Schedules are in third place and fourth are communications and cost calculations. Again surprisingly in firms as in municipalities only 7.7 % mentioned cost calculations which is interesting in light of how important this is in traditional Project Management. In the category 'other things' participants mentioned that all those alternatives are taken into account when Environmental Impacts (EI) are assessed, and planning and schedules are not unrelated concepts.

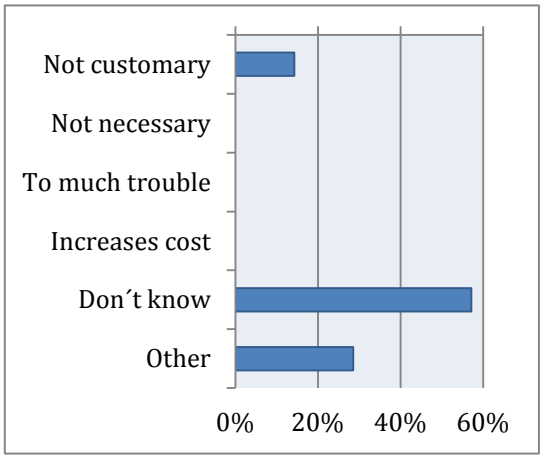

Figure 26 Integrate EM and PM (firms)

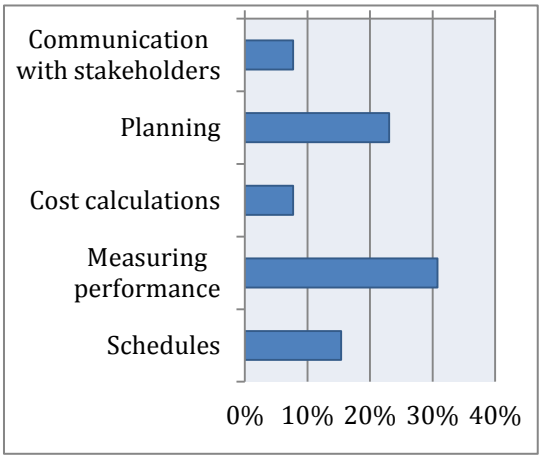

Figure 27 Can PM-methods improve EAM ? (firms)

4.3.3 Comparison of data analysis from municipalities and firms

Table 10 Comparison of results from both qestionnaires

Item	Municipalities		Firms	Similar	Difference
1	Many participants have specialisation an other field than environmental assessment	1	All participants have specialisation in environmental assessment		x
2	Men in majority of participants	2	Men in majority of participants	x	
3	Most participants in age range 35-49 years old	3	Most participants in age range 50-64 years old		x
4	Understanding Project Management (PM) methodology on a scale of (1-10)	3	Understanding Project Management (PM) methodology on a scale of (1-10)	x	
5	Importance of using Project Management (PM) methodology	5	Importance of using Project Management (PM) methodology	x	
6	Environmental Impact Assessment (EIA) is too costly, time consuming and hard to undarstand	6	Environmental Impact Assessment (EIA) is too costly, time consuming and hard to undarstand		x
7	High awareness of the scope of Environmental Management (EM)	7	High awareness of the scope of Environmental Management (EM)	x	
8	Implementation of Environmental Management systems (EMS)-ISO 14001	8	Implementation of Environmental Management systems (EMS)-ISO 14001		x
9	Simplify current procedures in Environmental Assessment Management (EAM) , methods, tools and technics etc,	9	Simplify current procedures in Environmental AssessmentManagement (EAM) , methods, tools and technics etc,		x
10	Project Management (PM) methodology can improve methods in Environmental Management (EM) and methods in Environmental Impact (EI)	10	Project Management (PM) methodology can improve methods in Environmental Management (EM) and methods in Environmental Impact (EI)		x

Comparing answers from municipalities and firms (table 10) it can be seen that four items, 2, 4, 5 and 7 are similar but six items 1, 3, 6, 8, 9 and 10 are different. How can that be interpreted? Firstly, the majority of participants assert that they have good

understanding of Project Management (PM) methodology and recognise the importance of using it. Secondly the participants in the municipalities state that they have a high awareness of the scope of Environmental Management (EM). Thirdly are the matters which are different between municipalities and firms. Among them are big environmental issues that can be approached in a different way and no easy or simple solutions is available concerning them. The approach depends on who is looking into the matter, environmental specialists or specialists in other fields.

4.4 Introduction to the Interviews

As the result from the questionnaire gave indications that either the participants did not understand the questions or they thought they were to complex 10 interviews were conducted towards the end of April 2012 to clarify and shed a light on mainly two things. Because only one municipality had implemented the Environmental Management system (EMS), ISO 14001, one out of the ten interviews focused on the effectiveness of this system[16]. Interviews were taken from all parts of Iceland to increase reliability. All participants in the interviews were working in the field of Environmental Management (EM)[17]. The two things that the interviews wanted to bring out were firstly, the statement from question 8:

> *Too much cost is one of the main reason for the environmental impact assessment (EIA) is not a very big part of the managerial process.*

The purpose of this statement was to find out if the cost would be less, then Environmental Impact Assessment (EIA) would be done to a greater extent than today. The thought was that the municipalities would very likely be more positive towards this process of assessment. Another aspect is whether the large cost associated with Environmental Impact Assessment (EIA) justifies the intended means. Following this was a discussion on two statements in question 13:

> *The decision process of assessing environmental impacts is a too complex and comprehensive process* and *implementing more simple process in assessing environmental impacts will lead to better environmental performance*.

[16] The participant in the interview who was well acquainted with EMS (ISO 14001), stated that ISO 14001 would be best suited alternative for municipalities to implement

[17] More information in appendix F

Secondly, question 14 in the questionnaire gave a very high response rate 'don't know'.

Why is Environmental Assessment Management not more integrated to basic factors of Project Management?

The basic idea was to find out if by striving for integration all environmental work within the municipalities would be more effective. In other words because of the well-known and effective methodology in Project Management it would be appropriate to apply it in Environmental Assessment Management.

4.4.1 Summary of interviews

Most participants in the interviews mentioned the high cost as one of many reasons associated with Environmental Impact Assessment (EIA). It was seen as a problem and avoided if possible, but because of legal obligations it could not. On the other hand involved parties try to stay within the criteria set out whether it is necessary or not. Environmental reports are so complex because they are written in a lot of technical jargon making them difficult to comprehend except for the experts themselves. The question is then how much the reports benefit the municipalities and the public.

In most cases the municipalities do not execute the Environmental Impact Assessment themselves, but hire expensive engineering firms for the task. Even though the municipalities find it painful to spend all this money in doing Environmental Impact Assessment (EIA), environmental matters compared to other matters in the municipalities are not the most expensive ones. The problem is that the local councils do not see the value in the nature. In the short run they only see the environmental assessment as a waste of time and money. In the long run they do not visualise the benefit for the municipality and the potentially lowering cost.

If the municipalities could choose between the current methodology and a much simpler one and easier to understand 'user-friendly' methodology, then they would rather switch to the simpler one leading to better environmental performance. The question is whether or not it is possible to create an environmental model (template) that local authorities could use and fill out which could both save time and money when assessing the environmental impacts of individual projects that the municipality intends to undertake. However that would mean that the individual assessment of environmental factors would have to be undertaken much sooner in the process. Thus it would be possible to see the impacts

(negative or positive) much sooner which individual interventions in nature might have. In general the focus should be on mapping environmental aspects and environmental indicators without always having the time pressure on individual projects that local authorities must undertake.

Following this it would be helpful to implement Environmental Management System (EMS)-ISO 14001 which provides the framework for setting and reviewing environmental objectives and targets, a structure that can be built on. If the municipality is faced with a process dilemma it can target all its processes based on the Environmental Management System, leading to a better and more effective Environmental Assessment Management in the municipality. More affective management tools and methods as well as quality systems are required today.

Using Project Management methods in Environmental Assessment Management makes all the work processes more effective. The advantages lie in the historic background of the Project Management methods that are continuously in a process of improvements towards best practice. Many participants were familiar with the basic factors of Project Management and could see advantages in using Environmental Management. Of course this partly depends on the background of those participants working on these issues. Yet precisely this point brings out the weaknesses in the governance of municipalities. The fact is that they do not always have sufficiently skilled staff with expertise in specific areas. Employees need to focus on many different things because there are not sufficient funds to conduct desirable specific fields. Whether a full or partly integration of the process methodology to Environmental Assessment Management is the issue or not without doubt, well trained and skilled individuals in Project Management methods who work in a field of Environmental Management have an advantage over others who have not. This leads to more focused, effective and efficient work with better results in the environmental assessment and management.

4.4.2 Interpretation of the interviews

The interviews show four categories: lower cost, simpler processes, user-friendly methods and more focused work. Focusing on the future and looking at options for simplifying the existing methods either in Environmental Impact Assessment (EIA) or Environmental Assessment Management (EAM) could result in a user-friendly methodology

that invite a more focused work in environmental matters in the municipalities and for others, potentially lowering costs. The interviews better clarified certain statements and questions in the questionnaire with unsatisfactory answers. Question 14 was one of the questions which gave a very high response rate of 'don´t know'. By talking to participants in the interviews on this question and explaining the basic thought behind asking it, most participants accepted that idea of integrating Environmental Assessment Management and Project Management. The advantages in so doing would probably lead to more focused work in environmental matters but definitions and clarifications are needed to show this can be achieved.

5 Results

5.1 Summary

In the municipalities it is often the same individuals that supervise different projects even without expertise on the subject matter. The project range is so wide that it is almost impossible to study each case to the fullest. This can be seen right from the start in data analysing procedures which show that 34 out of 48 (72.34 %) have other job titles than one related to environmental issues. By looking at the specialisation it confirms the opening words of this section as well. The majority of participants are men but the interest in environmental issues are higher among women[18]. The interest in environmental issues is yet generally high among all the participants. On the other hand representatives of the firms are all professionals in environmental issues with specialisation in that field of work. The majority of participants say that they have good understanding of Project Management methodology and recognise the importance of using it. This is further conformed in the first statement in question eight:

The importance of project management is underestimated,

This is a statement most of the participants from the municipalities and the firms agree on. The main focus in question 8 is on answers to three statements that indicate a certain trend to do more than just follow minimum legal obligations in environmental issues but also go beyond current practices and strive for a greater level of integration between Process Methodology and Environmental Assessment Management. How far it can go in that direction is uncertain and further research is required. However, it can be asserted that there is

[18] See appendix D

at least a reasonable justification to look into current methods to find out whether there is a need for further development or not.

Municipal representatives do not seem to appreciate the benefits of implementing the Environmental Management System (EMS) in same manner as firms do. One statement in question 13*:*

ISO:14001 itself puts forth specific environmental performance criteria,

actually confirms that participants in municipalities do not have good knowledge on ISO 14001 since according to the standard it does not itself state specific environmental performance criteria. If all the municipalities would be well informed the results would be in the 'disagree category' and 'strongly disagree' category. ISO 14001, which covers environmental management, can provide the municipalities with the elements of an effective Environmental Management System (EMS) that can be integrated with other management requirements and help municipalities achieve environmental and economic goals. The first statement in question 12:

Objectives and environmental performance in municipalities are in accordance with its declared environmental policy,

gives an indication from the participants answers, that awareness of environmental issues is high and shows a willingness to not look at environmental policy as empty words but also to follow them through.

In question 13 two statements stick out:

The decision process of assessing environmental impacts is a too complex and comprehensive process.

and

Implementing simpler process in assessing environmental impacts will lead to better environmental performance.

Answers from these statements give further reason to look at current methods in Environmental Assessment Management and build foundations on what has been said earlier, and helps to answer the research questions. Shortcomings in current procedures in Environmental Assessment Management are possible and in line with the former trend which has been discussed (section 2.4, section 4.3.1.2). However when these same statements were addressed to the professionals in the firms their approach was different. One obvious reason is

the fact that the procedure to assess environmental impacts is one of their sources of income. Even though professionals do not seem eager to change current procedures in Environmental Impact Assessment, like the former two statements here above indicate, they would not stand against improvements if they were available.

Finally participants were asked what Project Management methods could be best suited to improve methodology in Environmental Assessment Management. Communications with stakeholders in municipalities are considered very important, with planning and measuring performance not far behind. In firms, measuring performance is at the top of the list followed by planning. Overall measuring performance can be chosen as the most important alternative that can be taken from traditional Project Management methodology and applied to Environmental Assessment Management.

5.1.1 Discussions

What is the difference between process and methodology? Process is how you do something but methodology shows you the method (tells you the way you can do it). Process Methodology can be said to be a well-defined method with a set of tools that can be used in various types of management to ensure proper completion of projects. Applying Process Methodology to Environmental Assessment Management seems to be a logical thing to do. Some say that it is already practiced in Environmental Assessment Management but research shows that it is sensible to halt and view the current procedures to see if the methodology cannot be improved. A reason for starting a research does not always need to resolve a particular problem. To improve current methods is no less a goal.

But does this research give clues that show the need for improvement. Both the questionnaire and the interviews give indication in that direction. One cannot say that current methods or methodology in Environmental Assessment Management or Environmental Impact Assessment are inherently wrong but there always is a need to refine methods to achieve better results. Right from the start it can be seen by analysing the questionnaire and the conversations with different individuals in the municipalities that the interest in environmental issues and the awareness of the scope of Environmental Management is high. In light of these words it would not be surprising to see issues in Environmental Management increase. The fact is however that the representatives in the interviews state that there are not

enough skilled individuals to address environmental issues. The budget for environmental issues in municipalities is not high compared to other issues and the participants in the interviews talked about the high cost of making Environmental Impact Assessment, EIA for individual projects. The problem lies in the time-consuming and the complexity of the process. The fact is as has been said earlier that the municipalities' do not always have sufficiently skilled staff with expertise in specific areas. Individuals working in the field of environmental issues need to focus on many other issues due to the shortage of funds to conduct assessments in specific fields. Therefore it could be an option, to divide the country into a few work-stations with environmental specialists in each place. The municipalities could then seek advice and specialisation from these workstations, thus creating more focused work in the municipalities, independent of their size.

Another option would be to educate and train individual's better in Project Management methods. That training could be used for work in the field of environmental issues. Previously it has been stated in this study that Project Management methods are underestimated so it would be appropriate to make them more visible and efficient which could be beneficial for Environmental Management in the municipalities.

Implementation of Environmental Management Systems (EMS) is underestimated in the municipalities. From the data it can be seen that EMS is not recognised as an important part of environmental work in the municipalities. Reasons are given in this research (see section 4.3.1.1) which confirm a lack of interest which calls for better knowledge and understanding of its importance and a general recognition of the need for such a system.

Environmental managers and those that work in a field of environmental issues need to see that Environmental Management Systems(EMS), provides a structured system (i.e., plan, execute, check, revise) in which a set of management procedures are used to systematically identify, evaluate, manage, and address environmental issues and requirements

in the municipality (figure 28).

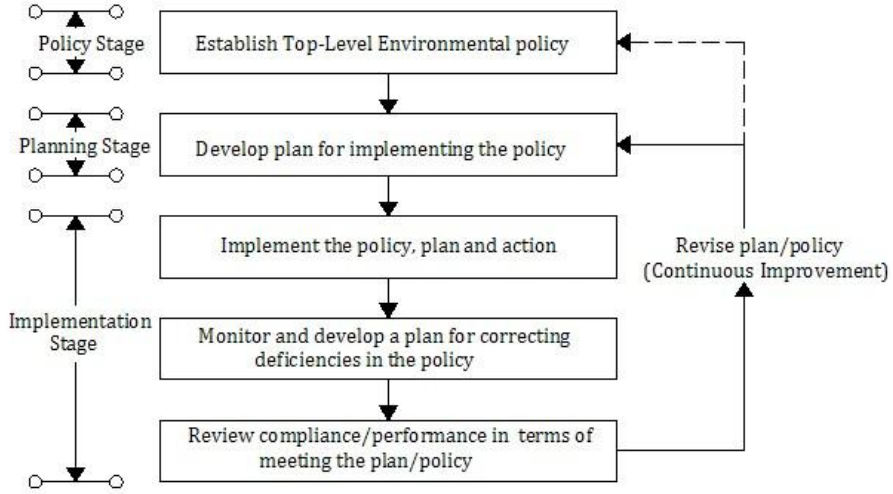

Figure 28 Overview of a typical ISO 14001, EMS (Eccleston, 2011,p:231)

The ISO 14001 standard requires the establishment of a high-level environmental policy statement from top management that establishes an environmental commitment and direction for the entire municipality. The policy is important, as it provides the programmatic direction and goals of the municipality. The policy must include:

1) Pollution prevention
2) Continuous improvement throughout the municipality
3) Compliance with applicable environmental regulations and standards that affect the municipality.

The policy provides a starting point for establishing Environmental Management System in the municipalities. Without doubt this would bring environmental issues to a higher level and create more focused and efficient work in that field. Of course this will neither be easy or swift but recognising the need to go beyond current practices and develop new more effective and efficient methods are worth considering. The question facing us is whether it is realistic to talk about using process methodology in Environmental Assessment Management

or not. A process is best defined as who is doing what, where, when and how to reach a certain goal. Processes are the foundation of successful projects.

The key factors[19] of an effective process which creates a multitude of advantages for municipalities is to:

i) Provide guidelines for efficient development of quality systems and solutions
ii) Reduce risk and increase predictability
iii) Capture and present best practice
iv) Promote a common vision and culture for the municipalities
v) Provide a roadmap for applying tools and techniques
vi) Easy to understand and simple to use.

The use of a project methodologies is the most significant factor in project management today. Methodologies impose a disciplined process on the project life cycle with the aim of making the execution and completion more predictable and more efficient. Therefore it is important to select the most appropriate methodology, identify processes and apply them. The key is to manipulate and configure things to suit the municipalities' purposes best. Using the proper methodology will help to bring the environmental issues and Environmental Assessment Management in the municipalities to a better focus and improve both effectiveness and efficiency. The majority of participants in the questionnaire survey agree with the statement that it is possible to use methods such as process methodology to measure performance in Environmental Assessment Management. Not many think it necessary to use the same methodology all the time when environmental impacts are assessed which indicates the willingness to be open to changes and not to get stuck in always doing things the same way. Take for example the Environmental Impact Assessment which is a scientific process to evaluate alternatives to proposals/plans or projects. In contrast an Environmental Management System (EMS) provides a system for implementing and monitoring an Environmental Impact Assessment (EIA) plan. Both these systems share many common features and the weaknesses of one process tends to be equalised by the strengths of the other. Properly combined the integrated EIA/EMS process can provide an efficient

[19] (Charvat, 2003, page.221)

method to evaluate and implement environmental issues. An integrated EIA/EMS[20] system provides an ideal system for scoping, evaluating and developing a sustainable plan/program or project. Municipalities are very different in size[21] and therefore also their ability to improve their environmental work whether it is an Environmental Impact Assessment or Environmental Assessment Management. This ability is completely dependent on whether the methods used are complex and comprehensive. The goal should be to create an'user-friendly 'environmental assessment model (template) which the majority of municipalities would be willing to use. This research does not focus on its development but gives indications for further investigation in the field of environmental issues in the municipalities concerning Environmental Impact Assessment (EIA) of individual projects and an Environmental Management Systems (EMS).

5.1.2 Interpretation of the findings

In municipalities the interest in environmental issues is high, generally suggested as being high in the society. Municipalities and firms are aware of increased pressure to let the environment have the benefit of the doubt when doubt arises. Therefore it is important for the municipalities to apply methods that lead to better environmental performance and promote effective and efficient work concerning Environmental Assessment Management. In doing so it is important to recognise and apply the Project Management methodology which the majority of those who participated in the questionnaire survey claim to be doing consciously. Some participants in the interviews stated that they probably are sometimes applying PM-methods unconsciously. At least what can be interpreted from the results is the possibility to form a basis for improvements. As said before the current methods used today are not inherently wrong but to achieve better results requires a constant need to refine them. There appears to be a lack of future vision on how Environmental Assessment Management will evolve to be more 'user-friendly' for the municipalities' and others that work in the field of Environmental Management. In the long-term that will possibly lead to a decrease in cost, less time consuming in assessing environmental impacts, more focused work and an increase in environmental performance. This research gives indications that it is necessary to go beyond

[20] See chapter 2, page.11
[21] Square kilometers (km^2) and population , see appendix H

legal obligations and strive for the highest level of an integrating Process Methodology and Environmental Assessment Management. Further research is needed to establish and formulate if it is realistic and how it could be done. All the representatives in the municipalities which participated in the interviews stated that if there would be an alternative for them to choose a simpler and more 'user-friendly' method to assess environmental impacts they would choose it.

From the results it could be interpreted that municipalities do not seem to understand the benefits of implementing Environmental Management Systems in same manner as firms do. The reason for asking the participants about the possibility to integrate Environmental Assessment Management more into basic Project Management methods was to find out if that would not bring forth more focused work. The interviews gave indications in that direction confirming that it is not unrealistic to apply Process Methodology to Environmental Assessment Management.

6 Conclusion

It is necessary to be familiar with the current methods used in Environmental Assessment Management in the municipalities to be able to recommend improvements if needed. This study is based on four research questions that relate to how current practices are and to see if there is a need for development or improvements in Environmental Assessment Management, by using a different methodology to increase environmental performance. In the literature review three lower levels of integration (see figure 2, p:6) were researched to establish a foundation for a different approach in Environmental Assessment Management. It shows gap in knowledge which is important to fill with further research and analyse in detail if it is possible to apply Process Methodology to Environmental Assessment Management. In recent years there have been enormous changes in Project Management and complementary management processes have been introduced like:

- Multinational teams - 2000
- Maturity models – 2001
- Strategic planning for Project Management (PM) – 2002
- Intranet status reporting – 2003

- Capacity-planning models – 2004
- Six Sigma integration with Project Management (PM) – 2005
- Virtual project management teams – 2006
- Lean/agile project management – 2007
- Best practices libraries – 2008
- Project Management (PM) methodologies – 2009
- Project Management business process certification - 2010.
  (Kerzner, 2010, page.246)

The integration of Project Management with these other management processes is a key in achieving sustainable excellence. (Kerzner, 2010).The data from the questionnaire can also be placed in the lower level of integration and by analyses it can be concluded that both the understanding and importance of Project Management is high in the municipalities and the firms. This gives an opportunity to integrate Project management methods to Environmental Assessment Management. It can be concluded that even though there is a big awareness of environmental issues in the municipalities, surprisingly there is a lack in awareness in current methods in Environmental Assessment Management. The answer lies partly in the various sizes of the municipalities. The fact is that there are not sufficiently skilled staff with expertise in specific areas. The same people need to focus on many different things because the funds are not sufficient to conduct specific fields and hire desirable specialists.

Another angle could be what some participants in the interviews stated that the Environmental Impact Assessment (EIA) is too costly and time consuming. The municipalities try to avoid the assessment, seeing it as a problem to be avoided if possible, but cannot because of legal obligations. One problem that the municipalities face is the lack of consistency in Environmental Assessment Management. If the municipalities would recognise the advantages in implementing Environmental Management system (EMS) as the basis for their environmental work all Environmental Assessment Management could be more synchronized. How would that help? One answer to that question could be that municipalities would see environmental assessments as beneficial (something positive) for the municipality not just a problem. Another problem that can be seen and has been mentioned before is that municipal representatives do not always see the value of nature, measure it not as being

profitable and therefore see no benefit in protecting it. Despite the revival in the protection of nature an even greater change of attitude will have to take place. In this research it is concluded that there is a growing need for reaching beyond laws and regulations, not only to fulfil minimum requirements. To reach that goal it is necessary to develop assessment methods for municipalities which are much simpler and easier to understand 'user-friendly' than current methods. If this could be done then municipalities would rather switch to the simpler method possibly leading to a better environmental performance. The question is whether or not it is achievable. The four research questions at the beginning of this research confirmed:

- indications of shortcomings in current methods in Environmental Assessment Management.
- That the complexity of environmental assessment methods can lead a to negative attitude towards environmental issues.
- A tendency to stagnate and get stuck in always doing things the same way instead of wanting to constantly improve methods.
-

Finally the question is:

How is it possible to apply Process Methodology to Environmental Assessment Management?

This could be experienced in the ultimate and future goal to strive for the highest level of integration (see figure 2, p:6). To integrate Environmental Assessment Management (EAM) with basic factors of Project Management (PM) or not, is not the task of this research but further study to find out is recommended. Today a growing demand is to protect the nature and return it to future generations in the same condition as we received it. It is important that current methods provide actual predictions of impacts and the understanding of the nature and behaviour of ecological systems does reflect in the environmental assessment. A contribution to improve current methods in managing environmental issues in the municipalities will then be recognised as a positive step to sustainable excellence.

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Appendix A: Questionnaire format to municipalities and firms

Questionnaire sent to municipalities

Other methods to achieve better environmental performance

General information

1. What is your gender? male[ ] female [ ]

2. What is your age group ? 16-24[ ] 25-34 [ ] 35-49 [ ] 50-64 [ ] 65+ [ ]

3. What is your Job title ? municipality manager [ ] environmental manager [ ]
director of environmental department [ ] civil engineer [ ]
other _____

4. What is your specialisation? environmental assessment [ ] project management [ ]
construction management [ ] other _____

5. What is your interest in environmental issues? very much [ ] much [ ] little [ ] very little [ ] none [ ]

Aspects related to project management (Manegerial process)

6. What is your understanding of the methodology of traditional project management on a scale of 1-10 ?
very low 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ] 6 [ ] 7 [ ] 8 [ ] 9 [ ] 10 [ ] very high

7. How important do you think the need is to use the traditional methodology of project management? very important [ ] important [ ] little important [ ] very little important [ ] none [ ]

8. Please indicate your agreement/disagreement on the following statements

	strongly agree	agree	neither/nor	disagree	strongly disagree
The importance of project management is underestimated	[ ]	[ ]	[ ]	[ ]	[ ]
Applying traditional project management methodology in managing projects in your municipality increases efficiency	[ ]	[ ]	[ ]	[ ]	[ ]
Traditional project management methods can be used in environmental assessment management	[ ]	[ ]	[ ]	[ ]	[ ]
An extra focus is needed on what impact individual environmental factors can have (positive or negative) on a project before construction permit is granded	[ ]	[ ]	[ ]	[ ]	[ ]
Too much cost is one of the main reason that EIA is not a very big part of the managerial process	[ ]	[ ]	[ ]	[ ]	[ ]
Good project management methodology can lead to better performance	[ ]	[ ]	[ ]	[ ]	[ ]
Good project management methodology can lead to financial benefits for the minicipality	[ ]	[ ]	[ ]	[ ]	[ ]
It is appropriate to use project management techniques to measure the success of the project when it comes to assessing the environmental impact	[ ]	[ ]	[ ]	[ ]	[ ]

Aspects related to environmental assessment

9. How high importance do envrionmental issues have in your municapality on a scale of 1-10 ?
very low 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ] 6 [ ] 7 [ ] 8 [ ] 9 [ ] 10 [ ] very high

	very much aware	much aware	neither/nor	little aware	very little aware
10.To what extend are you aware of the scope of environmental management in your municapality ?	[ ]	[ ]	[ ]	[ ]	[ ]

	yes	no	don´t know
11.Has your municipality implemented ISO:14001, international standard that specifies requirements for environmental management systems? If your answer is 'yes' you answer statements 11.a and 11.b otherwise go to question 12	[ ]	[ ]	[ ]

	strongly agree	agree	neither/nor	disagree	strongly disagree
11a.The implementation of ISO:14001 in your municapality has improved environmental performance	[ ]	[ ]	[ ]	[ ]	[ ]
ISO:14001 has resolved all proplems concerning environmental issues in your municapality	[ ]	[ ]	[ ]	[ ]	[ ]

11a.The implementation of ISO:14001 in your municapality has improved environmental performance

Open answer:

11b.Why does your municipality not impleneted ISO 14001?

12.Please indicate your agreement/disagreement with the following statements

	strongly agree	agree	neither/nor	disagree	strongly disagree
Objectives and environmental performance of your municipality are in a accordance with its declared environmental policy	[ ]	[ ]	[ ]	[ ]	[ ]
Laws and regulations on environmental issues do not solve all environmental problems	[ ]	[ ]	[ ]	[ ]	[ ]
The policy which the municapality has adopted does result in environmental benefits for the general public	[ ]	[ ]	[ ]	[ ]	[ ]
When the public is aware that their views on environmental issues will actually been used for policy-making they will be more willing to participate in that work	[ ]	[ ]	[ ]	[ ]	[ ]
When the public has an opportunity to be more involved in shaping environmental policy it leads to better environmental performance	[ ]	[ ]	[ ]	[ ]	[ ]

Aspects related to the integration of project management to environmental assessment management

13. Please indicate your agreement/disagreement on the following statements

	strongly agree	agree	neither/nor	disagree	strongly disagree
It is possible to use methods such as Process Methodology to achieve better environmental performance	[ ]	[ ]	[ ]	[ ]	[ ]
ISO: 14001 itself puts forth specific environmental performance criteria	[ ]	[ ]	[ ]	[ ]	[ ]
When environmental aspects are considered in your municipality are the opinions and needs of all stakeholders taken into account	[ ]	[ ]	[ ]	[ ]	[ ]
It is necessary to always use the same methodology when environmental impacts are assessed	[ ]	[ ]	[ ]	[ ]	[ ]
It is possible to apply Process Methodology to measure the effectiveness of environmental performance criteria	[ ]	[ ]	[ ]	[ ]	[ ]
The decision process of assessing environmental impacts is a too complex and comprehensive process	[ ]	[ ]	[ ]	[ ]	[ ]
Implementing a more simpler process in assessing environmental impacts will lead to a better environmental performance	[ ]	[ ]	[ ]	[ ]	[ ]
It is realistic to use Process Methodology in Environmental Assessment Management	[ ]	[ ]	[ ]	[ ]	[ ]

14. In light of the above statements, why is Environmental Assessment Management not more integrated to basic factors of Project Management ?

not customary	not neseccary	too much trouble	increases cost	don´t know
[ ]	[ ]	[ ]	[ ]	[ ]

15. What aspects of Project Management do you think could best improve methodology in Environmental Assessment Management?

communications with stakeholders	planning	cost calculations	measuring performance	schedules
[ ]	[ ]	[ ]	[ ]	[ ]

other_____

Spurningalisti til sveitarfélaga

Aðrar aðferðir til þess að ná enn betri árangri í umhverfismálum

Almennar upplýsingar

1. Hvert er kyn þitt? kk [ ] kvk [ ]

2. Hver er aldur þinn? 16-24[ ] 25-34 [ ] 35-49 [ ] 50-64 [ ] 65+ [ ]

3. Hvert er starfsheiti þitt? byggingarfulltrúi [ ] umhverfisstjóri [ ]
sviðsstjóri umhverfissviðs [ ] Verkfræðingur [ ] Annað _____

4. Hvert er sérsvið þitt? umhverfismál [ ] verkefnisstjórnun [ ] framkvæmdastjórnun [ ]
Annað _____

5. Hver er áhugi þinn á umhverfismálum? mjög mikill [ ] mikill [ ] lítill [ ] mjög lítill [ ] enginn [ ]

Atriði sem tengjast verkefnisstjórnun/framkvæmdastjórnun (Manegerial process)

6. Hver er skilningur þinn á aðferðarfræði í hefðbundinni verkefnisstjórnun á skalanum 1-10 ?
mjög lítill 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ] 6 [ ] 7 [ ] 8 [ ] 9 [ ] 10 [ ] mjög mikill

7. Hversu mikilvæga telur þú þörfina á
því að nota hefðbundna
aðferðarfræði við verkefnisstjórnun? mjög mikilvæg [ ] mikilvæg [ ] lítið mikilvæg [ ] mjög lítið mikilvæg [ ] enga [ ]

8. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum	mjög sammála	sammála	hvorki/né	ósammála	mjög ósammála
Mikilvægi hefbundinnar verkefnisstjórnunar er vanmetið	[ ]	[ ]	[ ]	[ ]	[ ]
Að nota hefbundna verkefnisstjórnun við stjórn framkvæmda í þínu sveitarfélagi eykur skilvirkni	[ ]	[ ]	[ ]	[ ]	[ ]
Aðferðir hefbundinnar verkefnisstjórnunar geta nýst í umhverfisstjórnun	[ ]	[ ]	[ ]	[ ]	[ ]
Auka þarf áherslur á hver áhrif einstakra umhverfisþátta geta haft (jákvæð eða neikvæð) á framkvæmd áður en almennt framkvæmdaleyfi er veitt	[ ]	[ ]	[ ]	[ ]	[ ]
Of mikill kostnaður er ein aðalástæðan fyrir því að mat á umhverfisáhrifum (MÁU) er ekki mjög stór þáttur í framkvæmdaferlinu	[ ]	[ ]	[ ]	[ ]	[ ]
Góð aðferðarfræði í verkefnisstjórnun getur leitt til betri árangurs	[ ]	[ ]	[ ]	[ ]	[ ]
Góð aðferðarfræði í verkefnisstjórnun getur leitt til efnahagslegs ávinnings fyrir sveitarfélagið	[ ]	[ ]	[ ]	[ ]	[ ]
Það er hentugt að nota aðferðir verkefnisstjórnunar við að mæla árangur tiltekins verkefnis eða framkvæmdar þegar kemur að því að meta umhverfisáhrif	[ ]	[ ]	[ ]	[ ]	[ ]

Atriði sem tengjast umhverfismálum(environmental issues)

9. Hversu hátt skrifuð eru umhverfismálin í þínu sveitarfélagi á skalanum 1-10 ?
mjög lágt 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ] 6 [ ] 7 [ ] 8 [ ] 9 [ ] 10 [ ] mjög hátt

	mjög meðvituð(aður)	meðvituð(aður)	hvorki/né	óméðvituð(aður)	mjög óméðvituð(aður)
10. Hversu mikið meðvituð(aður) ert þú um umfang umhverfisstjórnunar í þínu sveitarfélagi?	[ ]	[ ]	[ ]	[ ]	[ ]

	já	nei	veit ekki
11. Hefur þitt sveitarfélag innleitt ISO:14001, staðal um umhverfisstjórnun? Sé svar þitt já skaltu svara spurningu nr. 11a og 11.b annars heldur þú áfram frá spurningu nr. 12	[ ]	[ ]	[ ]

12. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum	mjög sammála	sammála	hvorki/né	ósammála	mjög ósammála
11a. Innleiðing ISO:14001 hefur skilað þínu sveitarfélagi betri árangri í umhverfismálum	[ ]	[ ]	[ ]	[ ]	[ ]
ISO:14001 hefur leyst öll vandamál sem sveitarfélagið fæst við sem snerta umhverfismál	[ ]	[ ]	[ ]	[ ]	[ ]

11b. Afhverju hefur þitt sveitarfélag ekki innleitt ISO 14001?

Opið svar:

12. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum	mjög sammála	sammála	hvorki/né	ósammála	mjög ósammála
Markmið og framkvæmd umhverfismála í þínu sveitarfélagi er í samræmi við yfirlýsta umhverfisstefnu þess	[ ]	[ ]	[ ]	[ ]	[ ]
Lög og reglugerðir um umhverfismál leysa ekki allan umhverfisvanda	[ ]	[ ]	[ ]	[ ]	[ ]
Stefnan sem þitt sveitarfélag hefur markað sér í umhverfismálum getur skilað sér sem hagsbætur fyrir almenning	[ ]	[ ]	[ ]	[ ]	[ ]
Þegar almenningur er sér meðvitaður um að þeirra sjónarmið eru raunverulega notuð til að marka stefnuna í umhverfismálum er hann viljugri til að taka þátt í þeirri vinnu	[ ]	[ ]	[ ]	[ ]	[ ]
Þegar almenningur fær tækifæri til að taka þátt í að móta stefnu í umhverfismálum gæti náðst betri árangur í þeim málaflokki	[ ]	[ ]	[ ]	[ ]	[ ]

Atriði í tengslum við að samþætta verkefnisstjórnun umhverfisstjórnun

13. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum	mjög sammála	sammála	hvorki/né	ósammála	mjög ósammála
Hægt er að nota aðferðir eins og til dæmis aðferðafræði verkefnisstjórnunar til þess að ná betri árangri í umhverfismálum	[ ]	[ ]	[ ]	[ ]	[ ]
ISO:14001 setur fram sérstaka mælikvarða á frammistöðu í umhverfismálum	[ ]	[ ]	[ ]	[ ]	[ ]
Þegar umhverfismál eru til skoðunar í þínu sveitarfélagi er haft samráð við alla hagsmunaaðila	[ ]	[ ]	[ ]	[ ]	[ ]
Nauðsynlegt er að nota alltaf sömu aðferðafræðina þegar umhverfisáhrif eru metin	[ ]	[ ]	[ ]	[ ]	[ ]
Hægt er að nota aðferðir verkefnisstjórnunar til að mæla árangur á frammistöðu í umhverfismálum	[ ]	[ ]	[ ]	[ ]	[ ]
Ákvarðanaferli við mat á umhverfisáhrifum er of flókið og viðamikið	[ ]	[ ]	[ ]	[ ]	[ ]
Einfaldara ferli við mat á umhverfisáhrifum myndi auka frammistöðu í umhverfismálum	[ ]	[ ]	[ ]	[ ]	[ ]
Raunhæft er að tala um að nota aðferðir verkefnisstjórnunar við umhverfisstjórnun	[ ]	[ ]	[ ]	[ ]	[ ]

14. Hvers vegna er umhverfisstjórnun ekki meira samtvinnuð grunnþáttum verkefnisstjórnunar í ljósi ofantaldra fullyrðinga?	Ekki venjan	óþarfi	of mikil fyrirhöfn	eykur kostnað	vet ekki
	[ ]	[ ]	[ ]	[ ]	[ ]

15. Hver eftirtalinna atriða sem tilheyra aðferðarfræði verkefnisstjórnunar telur þú að gætu helst bætt aðferðir við að meta umhverfisáhrif eða nýst í umhverfisstjórnun?	Samskipti við hagsmunaaðila	skipulagning	kostnaðaráætlanir	mæla árangur	áætlanagerð
	[ ]	[ ]	[ ]	[ ]	[ ]

Annað_____

Questionnaire sent to firms

Can other methods achieve better environmental performance?

General information

1. What is your gender? Men ☐ Woman ☐

2. What is your age group? 16-24 ☐ 25-34 ☐ 35-49 ☐ 50-64 ☐ 65+ ☐

3. What is your jobtitle? civil engineer ☐ practical civil engineer ☐ environmental scientist ☐
Other _____

4. What is your specialisation? environmantal assessment ☐ project management ☐
Other _____

5. What is your interest in environmental issues? very much ☐ much ☐ little ☐ very little ☐ none ☐

Aspects related to project management (Manegerial process)

6. What is your understanding of the methodology of traditional proejct management on a scale of 1-10 ?
very low 1 2 3 4 5 6 7 8 9 10 very high

7. How important do you think the need is to use the tradional methodology of project management? very important ☐ important ☐ little importance ☐ very little importance ☐ none ☐

8. Please indicate your agreement/disagreement with the following statements:

	strongly agree	agree	neither/nor	disagree	strongly disagree
The importance of project management is underestimated	○	○	○	○	○
Applying traditional project management methodology in managing projects increases efficiency	○	○	○	○	○
Traditional project management methods can be used in environmental assessment management	○	○	○	○	○
An extra focus is needed on what impact individual environmental factors can have (positive or negative) on a project before construction permit is granded	○	○	○	○	○
Too much cost is one of the main reason that EIA is not a very big part of the managerial process	○	○	○	○	○
Good project management methodology can lead to better performance	○	○	○	○	○
Good project management methodology can lead to financial benefits for the project owner	○	○	○	○	○
It is appropriate to use project management techniques to measure the success of the project when it comes to assessing the environmental impact	○	○	○	○	○

Aspects related to environmental assessment

9. How high importance do environmental issues have generally in the society on a scale of 1-10 ?
very low 1 2 3 4 5 6 7 8 9 10 very high

10. How much are you aware of the scope of environmental management in the municipalities?

very much aware ☐ much aware ☐ neither/nor ☐ little aware ☐ very little aware ☐

11. Has your municipality implemented ISO:14001, international standard that specifies requirements for environmental management systems?
If your answer is 'yes' you answer question 11.a otherwise go to question12

yes ☐ no ☐ no need for it ☐

11a. Statements about ISO 14001:

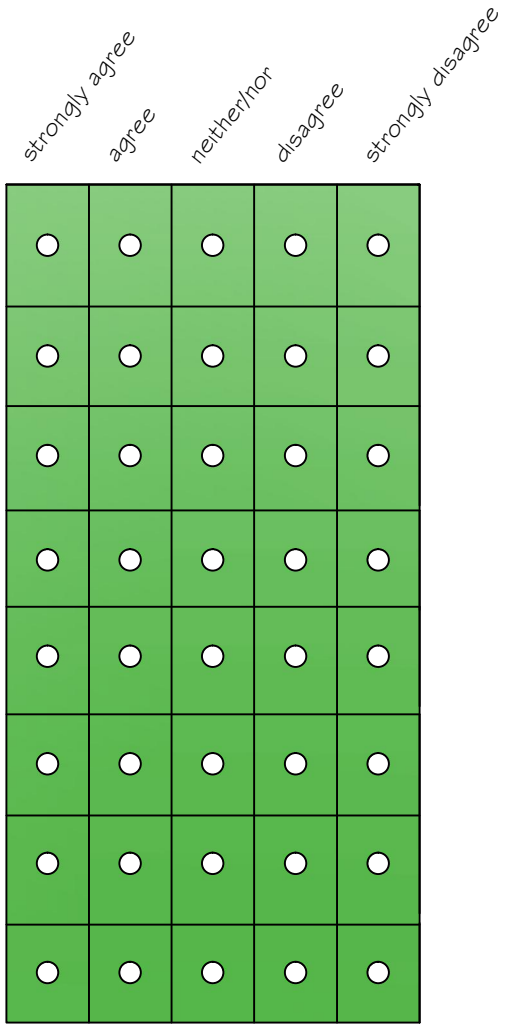
	strongly agree	agree	neither/nor	disagree	strongly disagree
The implementation of ISO:14001 in your firm has improved environmental performance	○	○	○	○	○
ISO:14001 has resolved all proplems concerning environmental issues in your firm	○	○	○	○	○

12. Please indicate your agreement/disagreement to the following statements

	strongly agree	agree	neither/nor	disagree	strongly disagree
Objectives and environmental performance of your municipality are in a accordance with its declared environmental policy	○	○	○	○	○
Laws and regulations on environmental issues do not solve all environmental problems	○	○	○	○	○
The policy which the municapality has adopted does result in environmental benefits for the general public	○	○	○	○	○
When the public is aware that their views on environmental issues will actually been used for policy-making they will be more willing to participate in that work	○	○	○	○	○
When the public has an opportunity to be more involved in shaping environmental policy it leads to better environmental performance	○	○	○	○	○

Aspects related to the integration of project management to environmental assessment management

13. Please indicate your agreement/disagreement to the following statements



14. In light of the above statements, why is Environmental Assessment Management not more integrated to basic factors of Project Management ?

☐ not customary ☐ not neseccary ☐ too much trouble ☐ increases cost ☐ don´t know

Other _____

15. What aspects of Project Management do you think could best improve methodology in Environmental Assessment Management?

☐ Communication with stakeholders ☐ planning ☐ cost calculations ☐ mesuring performance ☐ schedules

Other _____

Spurningalisti sendur til fyrirtækja

Geta aðrar aðferðir leitt til betri árangurs í umhverfismálum?

Almennar upplýsingar

1. Hvert er kyn þitt? karl ☐ kona ☐

2. Hver er aldur þinn? 16-24 ☐ 25-34 ☐ 35-49 ☐ 50-64 ☐ 65+ ☐

3. Hvert er starfsheiti þitt? verkfræðingur ☐ tæknifræðingur ☐ umhverfisfræðingur ☐
Annað _____

4. Hvert er sérsvið þitt? umhverfismál ☐ verkefnisstjórnun/framkvæmdastjórnun ☐
Annað _____

5. Hver er áhugi þinn á umhverfismálum? mjög mikill ☐ mikill ☐ lítill ☐ mjög lítill ☐ enginn ☐

Atriði sem tengjast verkefnisstjórnun/framkvæmdastjórnun (Manegerial process)

6. Hver er skilningur þínn á aðferðarfræði í hefðbundinni verkefnisstjórnun á skalanum 1-10 ?
mjög lítill 1 2 3 4 5 6 7 8 9 10 mjög mikill

7. Hversu mikilvæga telur þú þörfina á því að nota hefðbundna aðferðafræði við verkefnisstjórnun? mjög mikilvæg ☐ mikilvæg ☐ lítið mikilvæg ☐ mjög lítið mikilvæg ☐ enga ☐

8. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum :

	mjög sammála	sammála	hvorki/né	ósammála	mjög ósammála
Mikilvægi hefbundinnar verkefnisstjórnunar er vanmetið	○	○	○	○	○
Að nota hefbundna verkefnisstjórnun við stjórn framkvæmda eykur skilvirkni	○	○	○	○	○
Aðferðir hefbundinnar verkefnisstjórnunar geta nýst í umhverfisstjórnun	○	○	○	○	○
Auka þarf áherslur á hver áhrif einstakra umhverfisþátta geta haft (jákvæð eða neikvæð) á framkvæmd áður en almennt framkvæmdaleyfi er veitt	○	○	○	○	○
Of mikill kostnaður er ein aðalástæðan fyrir því að mat á umhverfisáhrifum (MÁU) er ekki mjög stór þáttur í framkvæmdaferlinu	○	○	○	○	○
Góð aðferðafræði í verkefnisstjórnun getur leitt til betri árangurs	○	○	○	○	○
Góð aðferðafræði í verkefnisstjórnun getur leitt til efnahagslegs ávinnings fyrir framkvæmdaaðilann	○	○	○	○	○
Það er hentugt að nota aðferðir verkefnisstjórnunar við að mæla árangur tiltekins verkefnis eða framkvæmdar þegar kemur að því að meta umhverfisáhrif	○	○	○	○	○

Atriði sem tengjast umhverfismálum(environmental issues)

9. Hvað hátt skrifuð eru umhverfismálin almennt séð í þjófélaginu á skalanum 1-10 ?
mjög lágt 1 2 3 4 5 6 7 8 9 10 mjög hátt

10. Hversu mikið meðvituð(aður) ert þú um umfang umhverfisstjórnunar almennt í sveitarfélögum?

mjög meðvituð(aður)	meðvituð(aður)	hvorki/né	ómeðvituð(aður)	mjög ómeðvituð(aður)
☐	☐	☐	☐	☐

11. Hefur þitt fyrirtæki innleitt ISO:14001, staðal um umhverfisstjórnun?
Sé svar þitt já skaltu merkja við fullyrðingar í nr. 11a áður en þú heldur áfram, annars heldur þú áfram frá spurningu nr. 12

já	nei	ekki þörf á því
☐	☐	☐

11a. Fullyrðingar um ISO 14001:

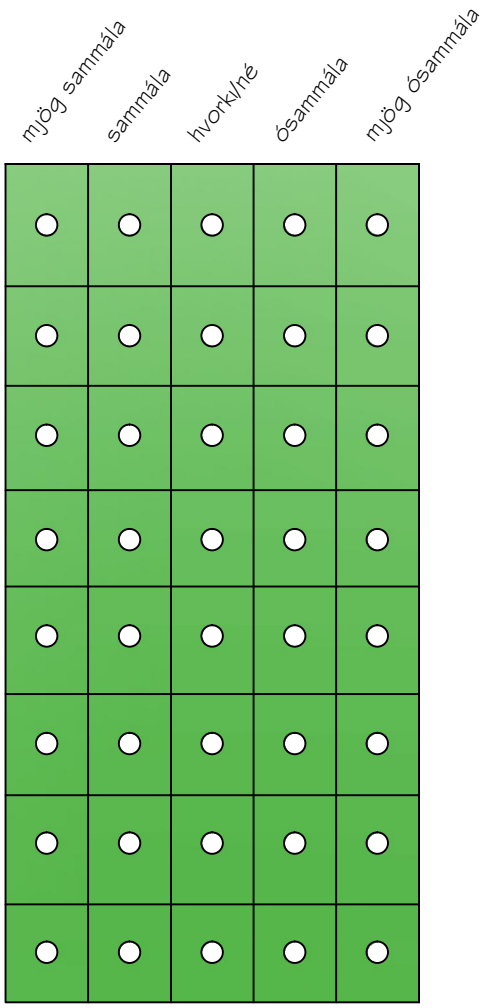
	mjög sammála	sammála	hvorki/né	ósammála	mjög ósammála
Innleiðing ISO:14001 hefur skilað þínu fyrirtæki betri árangri í umhverfismálum	○	○	○	○	○
ISO:14001 hefur leyst öll vandamál sem fyrirtæki þitt stendur frammi fyrir í umhverfismálum	○	○	○	○	○

12. Gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum:

	mjög sammála	sammála	hvorki/né	ósammála	mjög ósammála
Markmið og framkvæmd umhverfismála almennt í sveitarfélögum er í samræmi við yfirlýsta umhverfisstefnu þeirra	○	○	○	○	○
Lög og reglugerðir um umhverfismál leysa ekki allan umhverfisvanda	○	○	○	○	○
Stefnan sem sveitarfélög hafa markað sér í umhverfismálum ætti að skila sér sem hagsbætur fyrir almenning	○	○	○	○	○
Þegar almenningur er sér meðvitaður um að þeirra sjónarmið eru raunverulega notuð til að marka stefnuna í umhverfismálum er hann viljugri til að taka þátt í þeirri vinnu	○	○	○	○	○
Þegar almenningur fær tækifæri til að taka þátt í að móta stefnu í umhverfismálum gæti náðst betri árangur í þeim málaflokki	○	○	○	○	○

Atriði í tengslum við að samþætta verkefnisstjórnun umhverfisstjórnun

13. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum:



14. Hvers vegna er umhverfisstjórnun ekki meira samtvinnuð grunnþáttum verkefnisstjórnunar í ljósi ofantaldra fullyrðinga?

Ekki venjan ☐ óþarfi ☐ of mikil fyrirhöfn ☐ eykur kostnað ☐ veit ekki ☐

Annað _____

_____

15. Hver eftirtalinna atriða sem tilheyra aðferðafræði verkefnisstjórnunar telur þú að gætu helst bætt aðferðir við að meta umhverfisáhrif eða nýst í umhverfisstjórnun?

Samskipti við hagsmunaaðila ☐ skipulagning ☐ kostnaðargreiningar ☐ mæla árangur ☐ áætlanagerð ☐

Annað _____

_____

Appendix B: Basic data obtained from questionnaire in municipalities- 9.03.2012

Lokaverkefni í framkvæmdastjórnun

(Lokaverkefni í framkvæmdastjórnun 9.3.2012)

Lýsing á Rannsókn

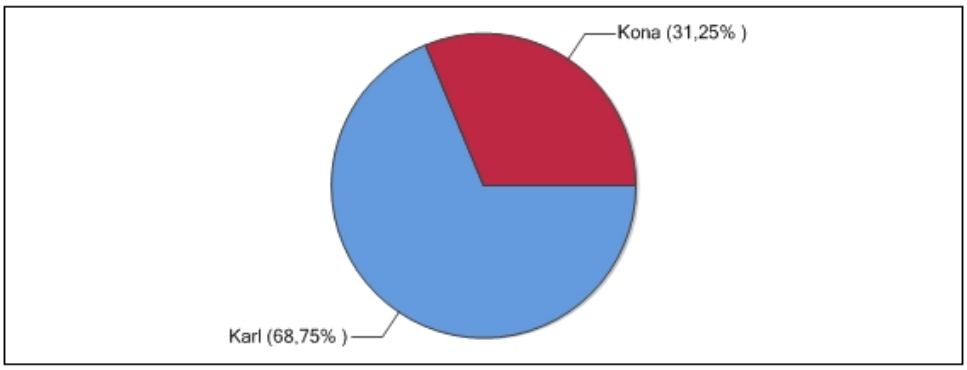
Nafn	Lokaverkefni í framkvæmdastjórnun 9.3.2012
Gerð virk	28.2.2012 - 13:07
Gerð óvirk	9.3.2012 - 14:20
Tímabil	28.2.2012 - 9.3.2012
Aðferð	Tölvupóstkönnun
Númer könnunar	18851

Stærð úrtaks og svörun

Upphaflegt úrtak	66
Fjöldi svarenda	48
Svöruðu ekki	18
Svarhlutfall	72,73%

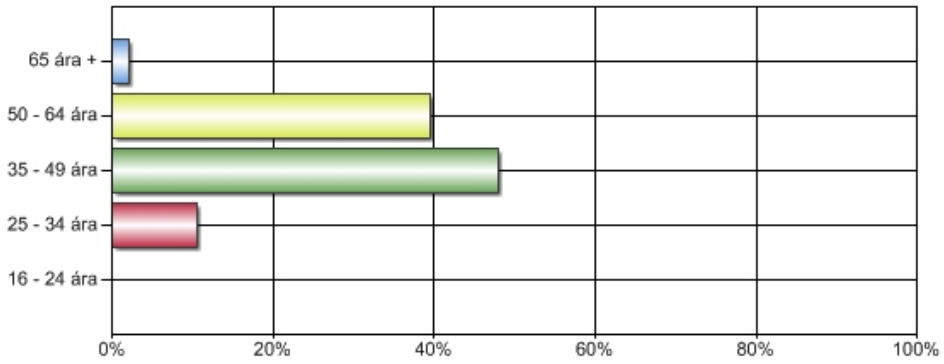
1. Hvert er kyn þitt?

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Karl	33	68,75%	+/-13,11%
Kona	15	31,25%	+/-13,11%
Alls	48	100%	



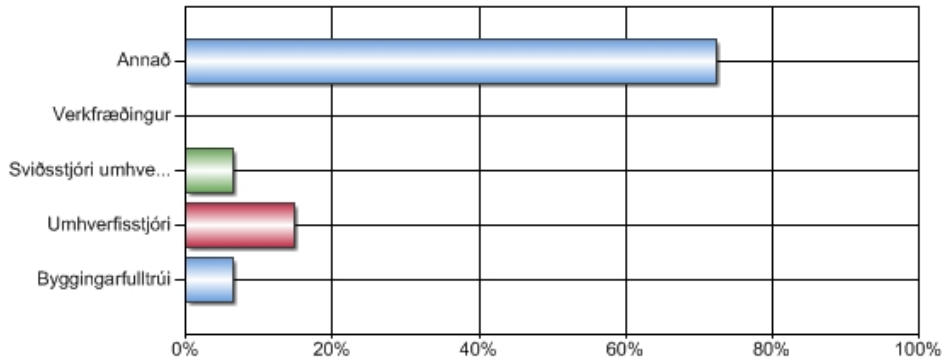
2. Hver er aldur þinn?

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
16 - 24 ára	0	0,00%	+/-0,00%
25 - 34 ára	5	10,42%	+/-8,64%
35 - 49 ára	23	47,92%	+/-14,13%
50 - 64 ára	19	39,58%	+/-13,83%
65 ára +	1	2,08%	+/-4,04%
Alls	48	100%	



3. Hvert er starfsheiti þitt?

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Byggingarfulltrúi	3	6,38%	+/-6,99%
Umhverfisstjóri	7	14,89%	+/-10,18%
Sviðsstjóri umhverfissviðs	3	6,38%	+/-6,99%
Verkfræðingur	0	0,00%	+/-0,00%
Annað	34	72,34%	+/-12,79%
Alls	47	100%	

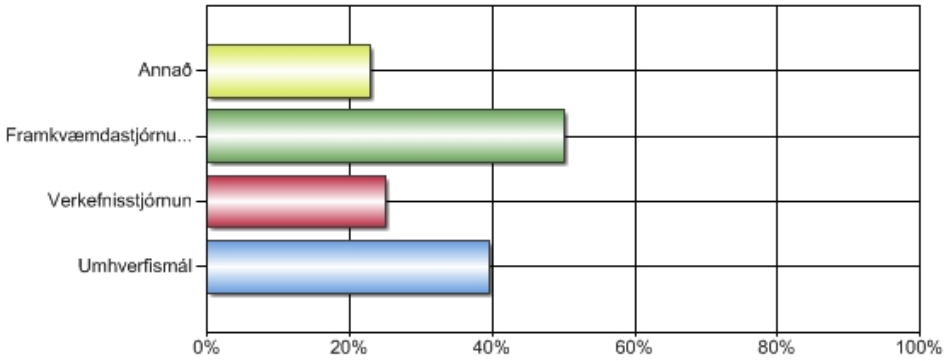


Annað:

- Bæjarstjóri
- Bókari
- Formaður Umhverfis og skipulagsnefndar
- Formaður umhverfis- og skipulagsnefndar
- formaður umhverfisnefndar
- Framkvæmdarstjóri Umhverfis- og skipulagssviðs
- Framkvæmdastjóri
- Framkvæmdastjóri
- framkvæmdastjóri sveitarfélags
- Fulltrúi á umhverfis- og tæknisviði
- Garðyrkjustjóri
- Oddviti
- Oddviti
- Oddviti
- Oddviti
- Skipulags- og byggingarfulltrúi
- Skipulags- og byggingarfulltrúi
- Skipulags- og byggingarfulltrúi
- skipulags- og byggingarfulltrúi
- Skipulags- og byggingarfulltrúi Rangárþings bs.
- Sveitarstjóri
- sveitarstjóri
- sveitarstjóri
- Sveitarstjóri
- sveitarstjóri
- Sveitarstjóri
- sveitarstjóri
- Sveitarstjóri
- Sveitarstjóri
- Sveitarstjóri
- Sviðsstjóri skipulags- og umhverfissviðs
- Umhverfisfulltrúi
- Verkefnastjóri
- Yfirmaður umhverfis- og skipulags+ umhverfismál

4. Hvert er sérsvið þitt?

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Umhverfismál	19	39,58%	+/-13,83%
Verkefnisstjórnun	12	25,00%	+/-12,25%
Framkvæmdastjórnun	24	50,00%	+/-14,15%
Annað	11	22,92%	+/-11,89%
Alls	66	100%	

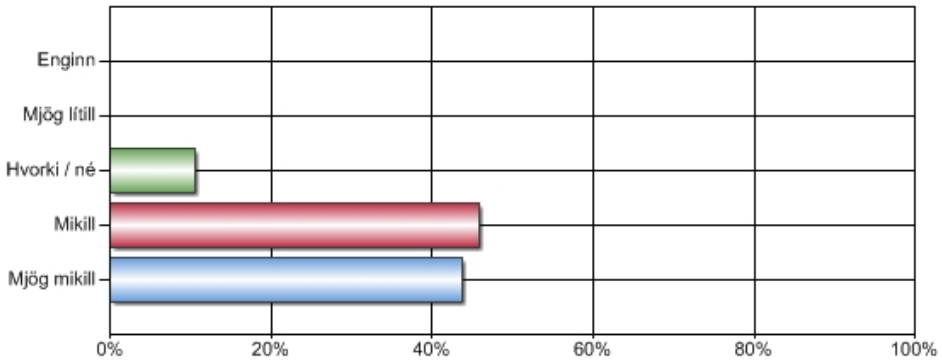


Annað:

-
- auk fjölda annara verkefna.
- Bókhald
- Bygginargar og verkefnastjórnum hef einnig grunnþekkingu í landmælingum, kortgerð og landskráningu. (Architectural Technology and Construction Management)
- Framkvæmdastjóri bæjarfélags
- Náttúran og friðlýst svæði
- Skipulags- og byggingamál
- Skipulags- og byggingarfulltrúi
- Skipulags- og byggingarmál
- Stjórnandi sveitarfélags
- stjórnsýsla

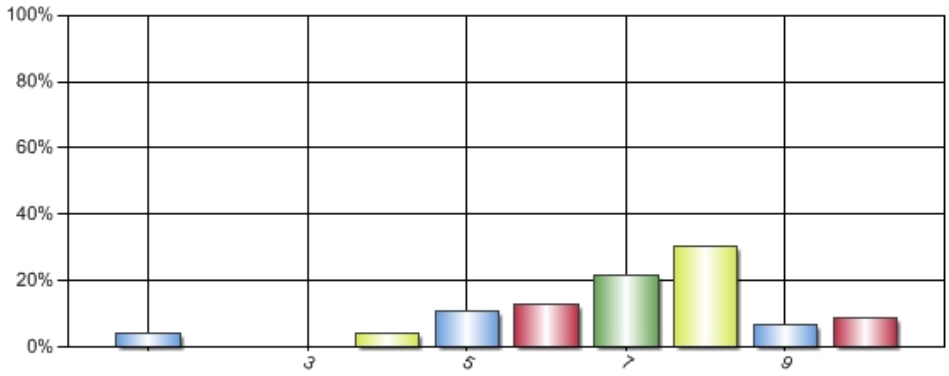
5. Hver er áhugi þinn á umhverfismálum?

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög mikill	21	43,75%	+/-14,03%
Mikill	22	45,83%	+/-14,10%
Hvorki / né	5	10,42%	+/-8,64%
Mjög lítill	0	0,00%	+/-0,00%
Enginn	0	0,00%	+/-0,00%
Alls	48	100%	



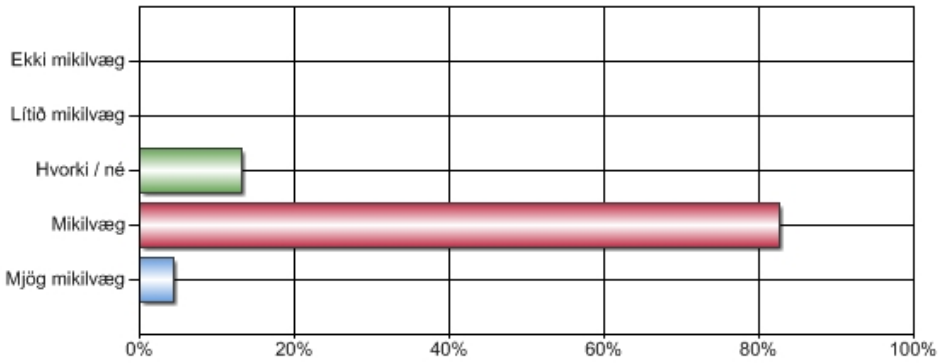
6. Hver er skilningur þinn á aðferðafræði í hefðbundinni verkefnastjórnun á skalanum 1 - 10?

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög lítill - 1	2	4,35%	+/-5,89%
2	0	0,00%	+/-0,00%
3	0	0,00%	+/-0,00%
4	2	4,35%	+/-5,89%
5	5	10,87%	+/-8,99%
6	6	13,04%	+/-9,73%
7	10	21,74%	+/-11,92%
8	14	30,43%	+/-13,30%
9	3	6,52%	+/-7,14%
Mjög mikill - 10	4	8,70%	+/-8,14%
Alls	46	100%	



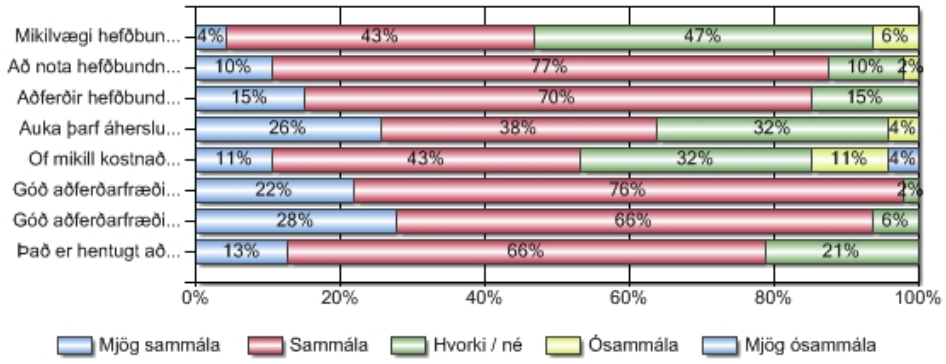
7. Hversu mikilvæga telur þú þörfina á því að nota hefðbundna aðferðafræði við verkefnisstjórnun?

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög mikilvæg	2	4,35%	+/-5,89%
Mikilvæg	38	82,61%	+/-10,95%
Hvorki / né	6	13,04%	+/-9,73%
Lítið mikilvæg	0	0,00%	+/-0,00%
Ekki mikilvæg	0	0,00%	+/-0,00%
Alls	46	100%	



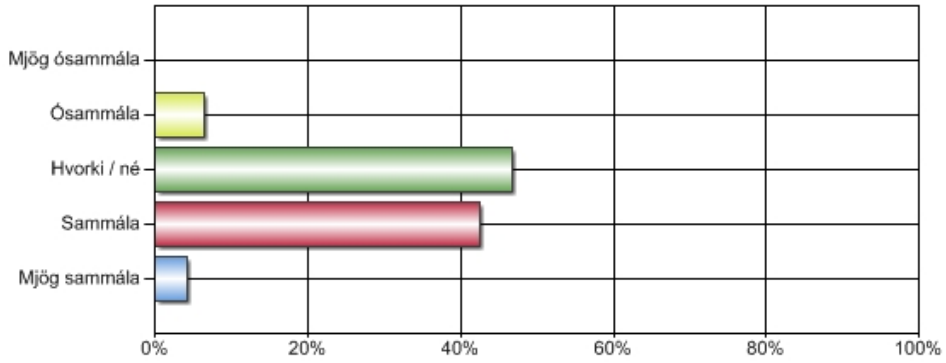
8. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum: Eða hversu sammála ertu eftirfarandi fullyrðingum:

	Fjöldi	Mjög sammála	Sammála	Hvorki / né	Ósammála	Mjög ósammála
Mikilvægi hefðbundinnar verkefnisstjórnunar er vanmetið.	47	4%	43%	47%	6%	0%
Að nota hefðbundna verkefnisstjórnun við stjórn framkvæmda í þínu sveitarfélagi eykur skilvirkni.	48	10%	77%	10%	2%	0%
Aðferðir hefðbundinnar verkefnisstjórnunar geta nýst í umhverfisstjórnun.	47	15%	70%	15%	0%	0%
Auka þarf áherslur á hver áhrif einstakra umhverfisþátta geta haft (jákvæð eða neikvæð) á framkvæmd áður en almennt framkvæmdaleyfi er veitt.	47	26%	38%	32%	4%	0%
Of mikill kostnaður er ein aðalástæða fyrir því að mat á umhverfisáhrifum(MÁU) er ekki mjög stór þáttur í framkvæmdaferlinu.	47	11%	43%	32%	11%	4%
Góð aðferðarfræði í verkefnisstjórnun getur leitt til betri árangurs.	46	22%	76%	2%	0%	0%
Góð aðferðarfræði í verkefnisstjórnun getur leitt til efnahagslegs ávinnings fyrir sveitarfélagið.	47	28%	66%	6%	0%	0%
Það er hentugt að nota aðferðir verkefnisstjórnunar við að mæla árangur tiltekins verkefnis eða framkvæmdar þegar kemur að því að meta umhverfisáhrif.	47	13%	66%	21%	0%	0%



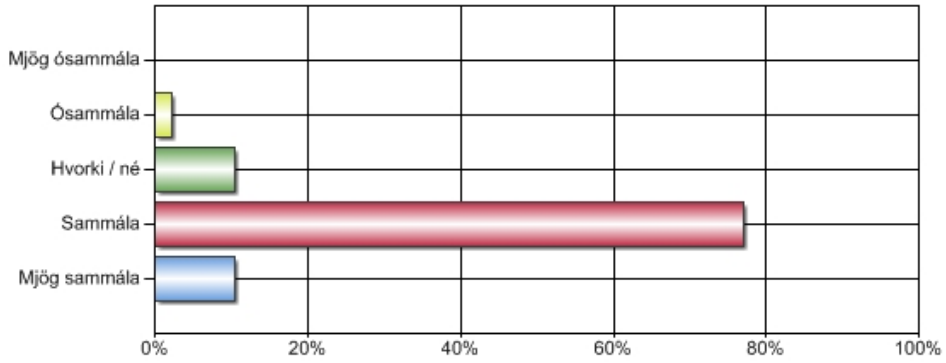
8. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum: Eða hversu sammála ertu eftirfarandi fullyrðingum: : Mikilvægi hefðbundinnar verkefnisstjórnunar er vanmetið.

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	2	4,26%	+/-5,77%
Sammála	20	42,55%	+/-14,14%
Hvorki / né	22	46,81%	+/-14,27%
Ósammála	3	6,38%	+/-6,99%
Mjög ósammála	0	0,00%	+/-0,00%
Alls	47	100%	



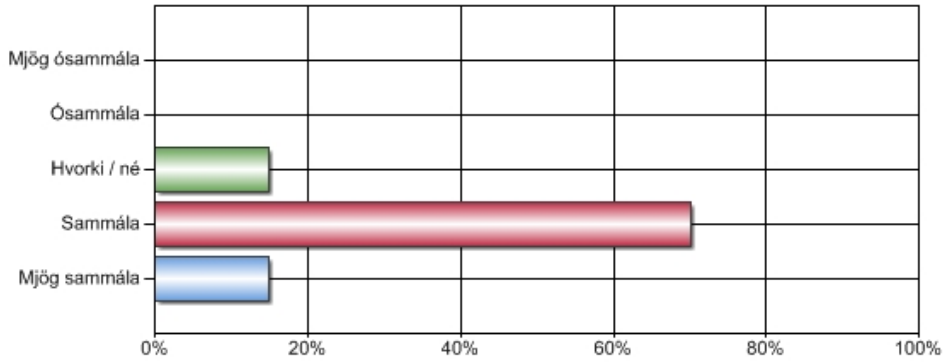
8. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum: Eða hversu sammála ertu eftirfarandi fullyrðingum: : Að nota hefðbundna verkefnisstjórnun við stjórn framkvæmda í þínu sveitarfélagi eykur skilvirkni.

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	5	10,42%	+/-8,64%
Sammála	37	77,08%	+/-11,89%
Hvorki / né	5	10,42%	+/-8,64%
Ósammála	1	2,08%	+/-4,04%
Mjög ósammála	0	0,00%	+/-0,00%
Alls	48	100%	



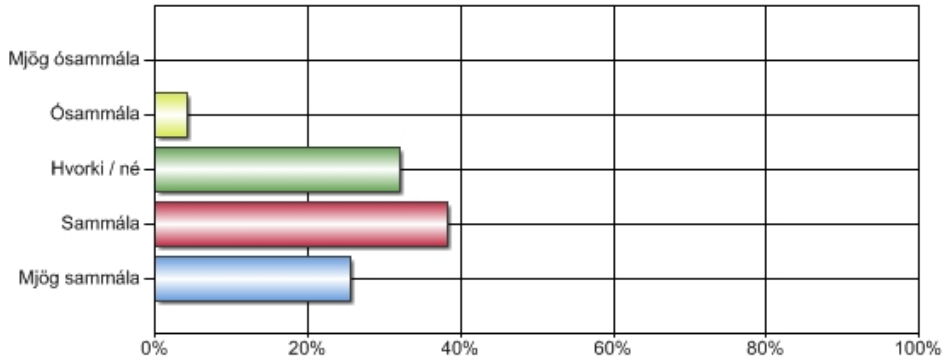
8. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum: Eða hversu sammála ertu eftirfarandi fullyrðingum: : Aðferðir hefðbundinnar verkefnisstjórnunar geta nýst í umhverfisstjórnun.

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	7	14,89%	+/-10,18%
Sammála	33	70,21%	+/-13,07%
Hvorki / né	7	14,89%	+/-10,18%
Ósammála	0	0,00%	+/-0,00%
Mjög ósammála	0	0,00%	+/-0,00%
Alls	47	100%	



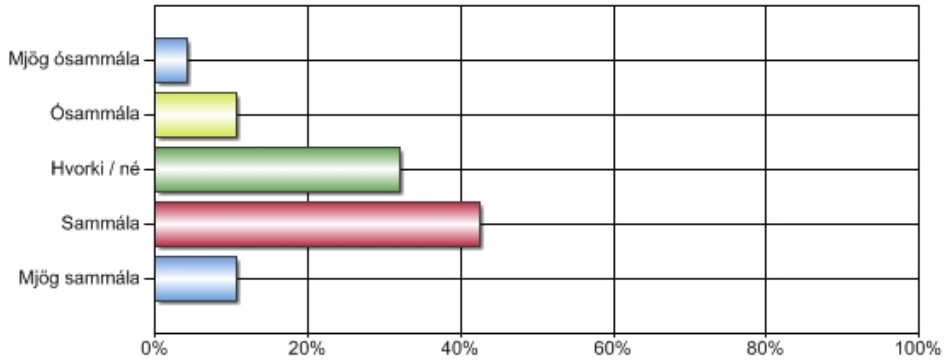
8. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum: Eða hversu sammála ertu eftirfarandi fullyrðingum: : Auka þarf áherslur á hver áhrif einstakra umhverfisþátta geta haft (jákvæð eða neikvæð) á framkvæmd áður en almennt framkvæmdaleyfi er veitt.

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	12	25,53%	+/-12,47%
Sammála	18	38,30%	+/-13,90%
Hvorki / né	15	31,91%	+/-13,33%
Ósammála	2	4,26%	+/-5,77%
Mjög ósammála	0	0,00%	+/-0,00%
Alls	47	100%	



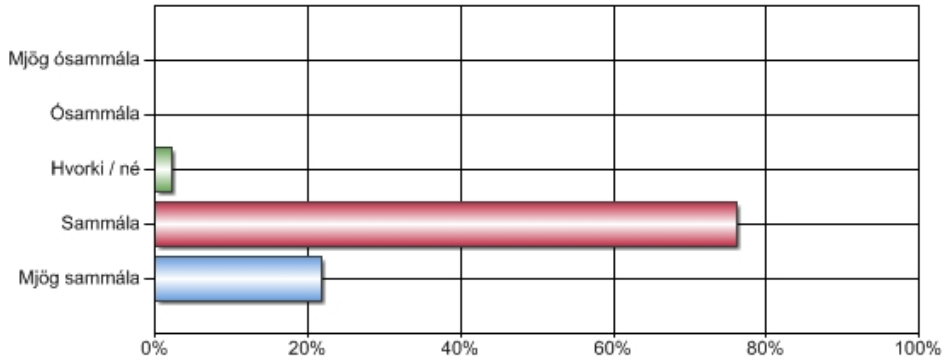
8. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum: Eða hversu sammála ertu eftirfarandi fullyrðingum: : Of mikill kostnaður er ein aðalástæða fyrir því að mat á umhverfisáhrifum(MÁU) er ekki mjög stór þáttur í framkvæmdaferlinu.

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	5	10,64%	+/-8,81%
Sammála	20	42,55%	+/-14,14%
Hvorki / né	15	31,91%	+/-13,33%
Ósammála	5	10,64%	+/-8,81%
Mjög ósammála	2	4,26%	+/-5,77%
Alls	47	100%	



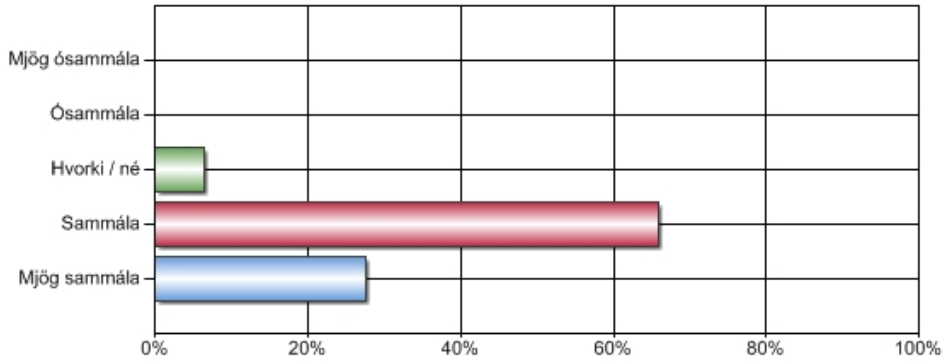
8. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum: Eða hversu sammála ertu eftirfarandi fullyrðingum: : Góð aðferðarfræði í verkefnisstjórnun getur leitt til betri árangurs.

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	10	21,74%	+/-11,92%
Sammála	35	76,09%	+/-12,33%
Hvorki / né	1	2,17%	+/-4,21%
Ósammála	0	0,00%	+/-0,00%
Mjög ósammála	0	0,00%	+/-0,00%
Alls	46	100%	



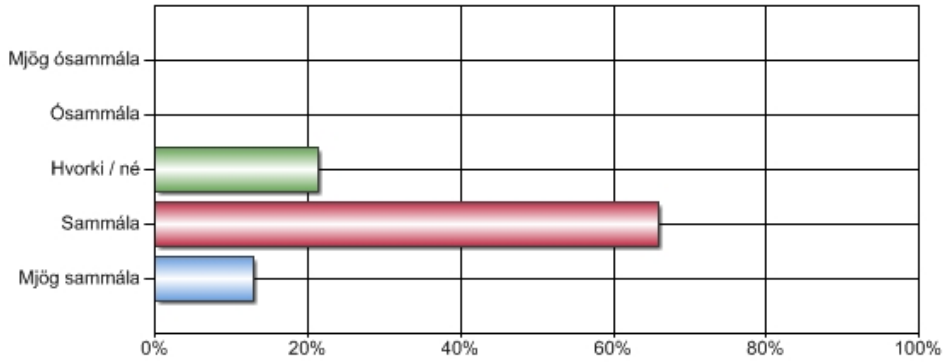
8. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum: Eða hversu sammála ertu eftirfarandi fullyrðingum: : Góð aðferðarfræði í verkefnisstjórnun getur leitt til efnahagslegs ávinnings fyrir sveitarfélagið.

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	13	27,66%	+/-12,79%
Sammála	31	65,96%	+/-13,55%
Hvorki / né	3	6,38%	+/-6,99%
Ósammála	0	0,00%	+/-0,00%
Mjög ósammála	0	0,00%	+/-0,00%
Alls	47	100%	



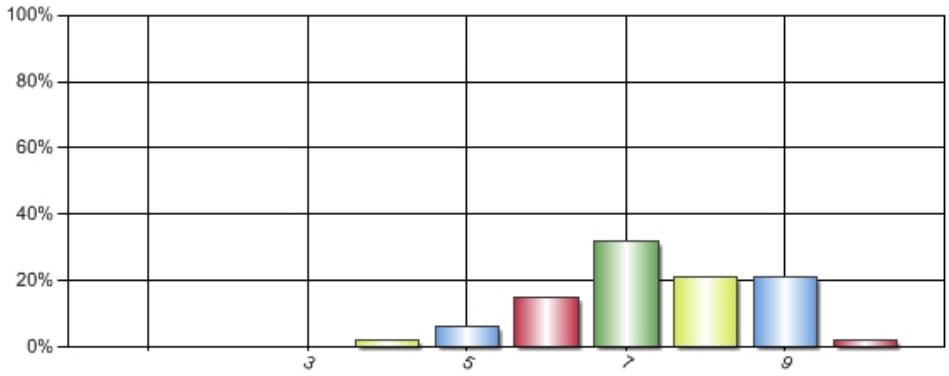
8. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum: Eða hversu sammála ertu eftirfarandi fullyrðingum: : Það er hentugt að nota aðferðir verkefnisstjórnunar við að mæla árangur tiltekins verkefnis eða framkvæmdar þegar kemur að því að meta umhverfisáhrif.

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	6	12,77%	+/-9,54%
Sammála	31	65,96%	+/-13,55%
Hvorki / né	10	21,28%	+/-11,70%
Ósammála	0	0,00%	+/-0,00%
Mjög ósammála	0	0,00%	+/-0,00%
Alls	47	100%	



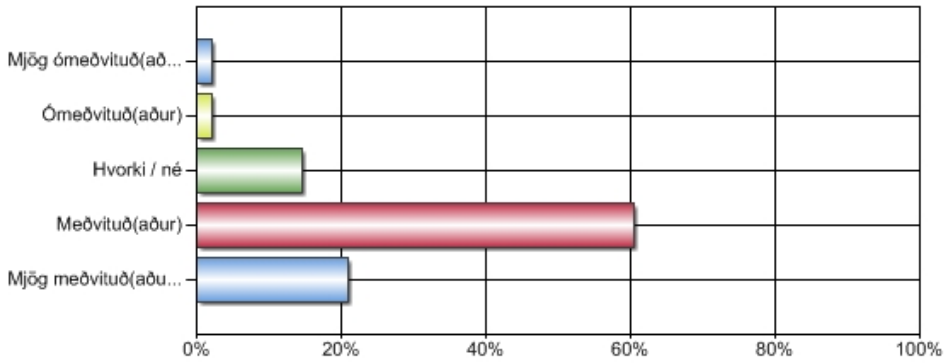
9. Hversu hátt skrifuð eru umhverfismálin í þínu sveitarfélagi á skalanum 1-10 ?

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög lágt - 1	0	0,00%	+/-0,00%
2	0	0,00%	+/-0,00%
3	0	0,00%	+/-0,00%
4	1	2,13%	+/-4,13%
5	3	6,38%	+/-6,99%
6	7	14,89%	+/-10,18%
7	15	31,91%	+/-13,33%
8	10	21,28%	+/-11,70%
9	10	21,28%	+/-11,70%
Mjög hátt - 10	1	2,13%	+/-4,13%
Alls	47	100%	



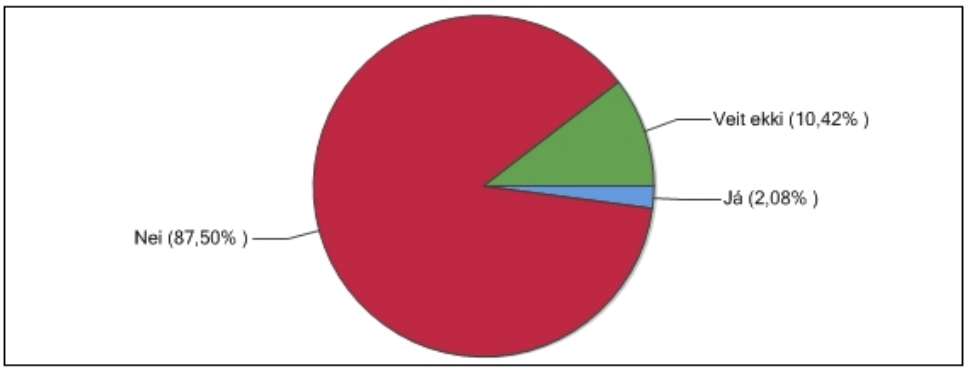
10. Hversu meðvituð(aður) ert þú um umfang umhverfisstjórnunar í þínu sveitarfélagi?

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög meðvituð(aður)	10	20,83%	+/-11,49%
Meðvituð(aður)	29	60,42%	+/-13,83%
Hvorki / né	7	14,58%	+/-9,98%
Ómeðvituð(aður)	1	2,08%	+/-4,04%
Mjög ómeðvituð(aður)	1	2,08%	+/-4,04%
Alls	48	100%	



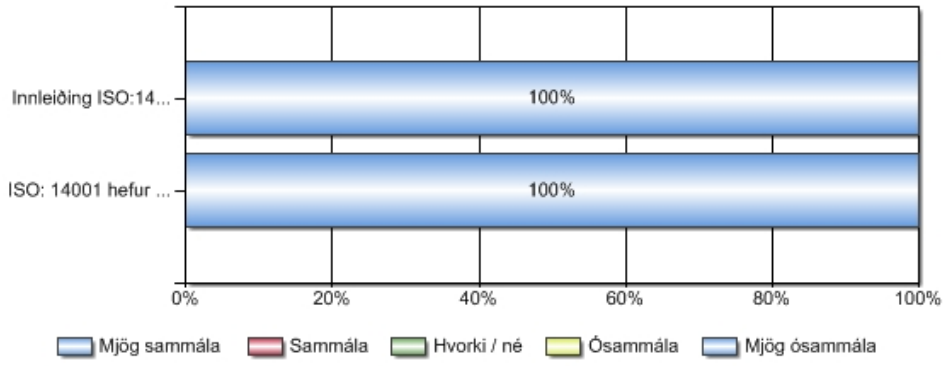
11. Hefur þitt sveitarfélag innleitt ISO:14001, staðal um umhverfisstjórnun?

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Já	1	2,08%	+/-4,04%
Nei	42	87,50%	+/-9,36%
Veit ekki	5	10,42%	+/-8,64%
Alls	48	100%	



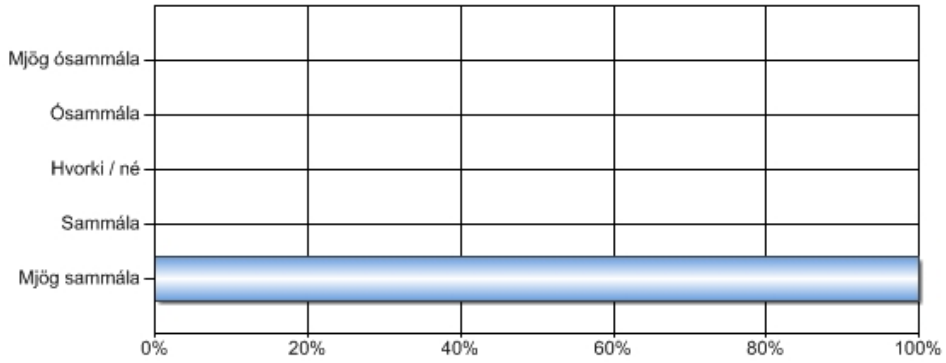
11.a Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum:

	Fjöldi	Mjög sammála	Sammála	Hvorki / né	Ósammála	Mjög ósammála
Innleiðing ISO:14001 hefur skilað þínu sveitarfélagi betri árangri í umhverfismálum	1	100%	0%	0%	0%	0%
ISO: 14001 hefur leyst öll vandamál sem sveitarfélagið fæst við sem snerta umhverfismál	1	0%	0%	0%	0%	100%



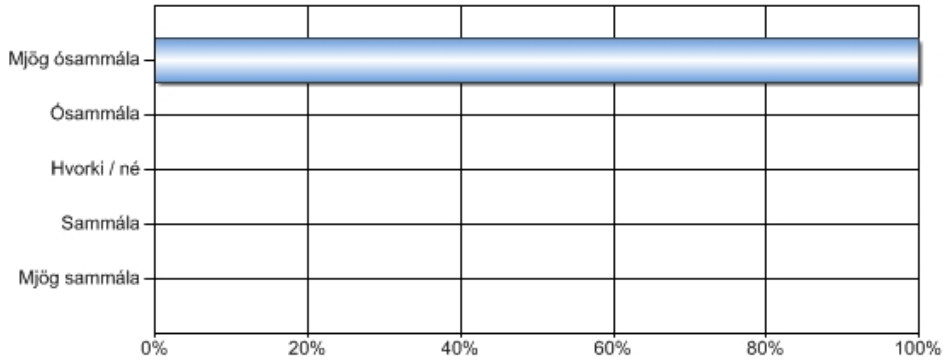
11.a Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum: : Innleiðing ISO:14001 hefur skilað þínu sveitarfélagi betri árangri í umhverfismálum

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	1	100,00%	+/-0,00%
Sammála	0	0,00%	+/-0,00%
Hvorki / né	0	0,00%	+/-0,00%
Ósammála	0	0,00%	+/-0,00%
Mjög ósammála	0	0,00%	+/-0,00%
Alls	1	100%	



11.a Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum: : ISO: 14001 hefur leyst öll vandamál sem sveitarfélagið fæst við sem snerta umhverfismál

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	0	0,00%	+/-0,00%
Sammála	0	0,00%	+/-0,00%
Hvorki / né	0	0,00%	+/-0,00%
Ósammála	0	0,00%	+/-0,00%
Mjög ósammála	1	100,00%	+/-0,00%
Alls	1	100%	



11 b. Af hverju hefur þitt sveitarfélag ekki innleitt ISO: 14001?

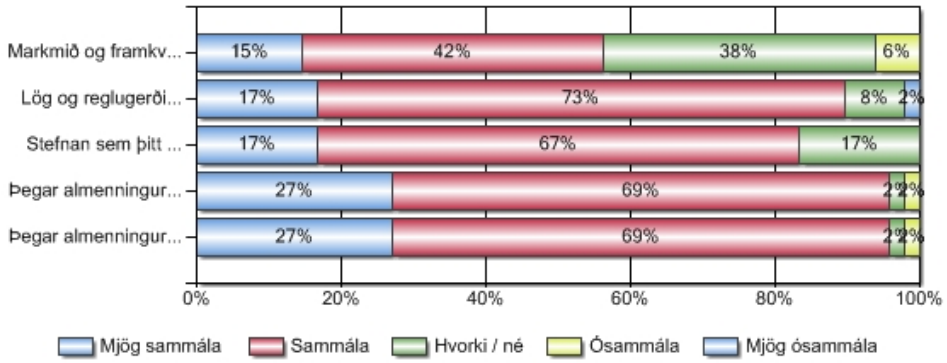
Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Svar:	31	100,00%	+/-0,00%
Alls	31	100%	

Svar::

- ....
- á ekki við
- Af óþekktum ástæðum
- Ekki áhugi hjá yfirstjórn bæjarfélagsins.
- Ekki áhugi og ekki lagaskylda. Óvíst um hvaða hag bæjarfélagið hefði af því fram yfir útlagðan kostnað.
- Ekki gefist tími til þess
- Ekki hefur verið vilji til þess að innleiða ISO:14001
- Ekki komið í umræðuna, tíma leysi, osfv.
- Ekki næg almenn þekking á málinu og því ekki nægur áhugi heldur.
- Ekki verið talin þörf á, enn.
- Engin sérstök ástæða, höfum ekki skoðað það.
- Engin sérstök ástæða. Því hefur ekki verið komið í framkvæmd.
- Líklega áhugaleysi eða metnaðarleysi. Kannski hræðsla við kostnað eða tímaskortur. Líklega blanda af öllu saman.
- Lítið sveitarfélag
- Menn telja það ekki eiga við
- Reikna með því að það sé vegna kostnaðar sem fylgir undirbúningi í að innleiða ISO 14001
- Slíkt hefur ekki komið til tals í umhverfismálaráði sveitarfélagsins né í bæjarstjórn.
- Það hefur ekki komið til umræðu
- Þarf að kynna mér það.
- þekki þetta ekki
- Tímaskortur.
- Ufang sveitarfélagsins og verkefni hafa ekki þrýst það mikið á að það hafi komist til framkvæmda.
- Umhverfisstjórnun er ekki með svo markvissum hætti.
- Vegna anna
- Vegna smæðar sveitarfélagsins
- Vegna smæðar sveitarfélagsins.
- Vegna umfangs, kostnaðar og eftirfylgni. Of stór biti fyrir litla einingu.
- Veit ekki
- Veit ekki!
- Við erum lítið sveitarfélag og höfum nóg af verkefnum. Við erum með mikla umhverfisvitund þá við vinnum ekki eftir þessum staðli.
- Við höfum ekki setta mál á dagskrá. BSI á Íslandi hefur vakið athygli okkar á þessu máli. Með ISO:14001 er hægt að meta stöðu umhverfismála og fá þekkingu á vottun á umhverfisstjórnunarkerfum

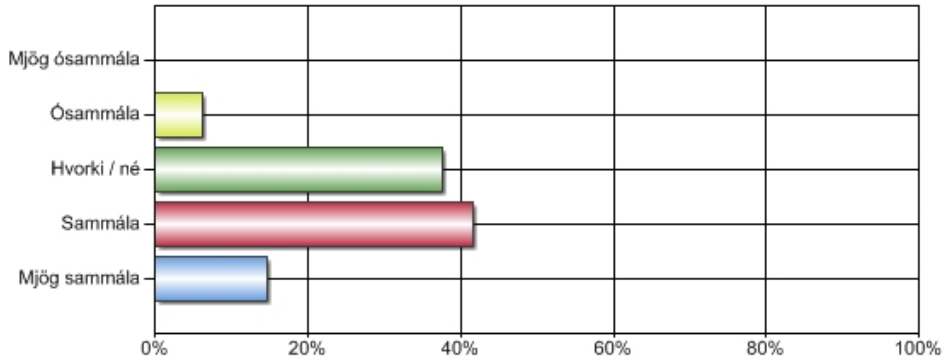
12. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum:

	Fjöldi	Mjög sammála	Sammála	Hvorki / né	Ósammála	Mjög ósammála
Markmið og framkvæmd umhverfismála í þínu sveitarfélagi er í samræmi við yfirlýsta umhverfisstefnu þess.	48	15%	42%	38%	6%	0%
Lög og reglugerðir um umhverfismál leysa ekki allan umhverfisvanda.	48	17%	73%	8%	0%	2%
Stefnan sem þitt sveitarfélag hefur markað sér í umhverfismálum getur skilað sér sem hagsbætur fyrir almenning.	48	17%	67%	17%	0%	0%
Þegar almenningur er sér meðvitaður um að þeirra sjónarmið eru raunverulega notuð til að marka stefnuna í umhverfismálum er hann viljugri til að taka þátt í þeirri vinnu.	48	27%	69%	2%	2%	0%
Þegar almenningur fær tækifæri til að taka þátt í að móta stefnu í umhverfismálum gæti náðst betri árangur í þeim málaflokki.	48	27%	69%	2%	2%	0%



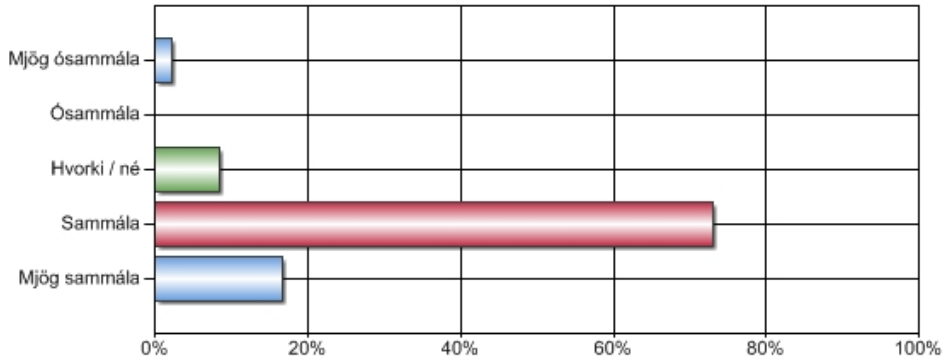
12. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum: : Markmið og framkvæmd umhverfismála í þínu sveitarfélagi er í samræmi við yfirlýsta umhverfisstefnu þess.

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	7	14,58%	+/-9,98%
Sammála	20	41,67%	+/-13,95%
Hvorki / né	18	37,50%	+/-13,70%
Ósammála	3	6,25%	+/-6,85%
Mjög ósammála	0	0,00%	+/-0,00%
Alls	48	100%	



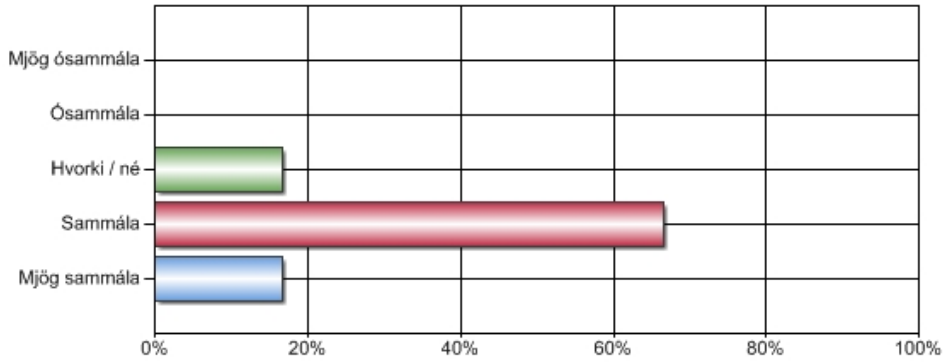
12. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum: : Lög og reglugerðir um umhverfismál leysa ekki allan umhverfisvanda.

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	8	16,67%	+/-10,54%
Sammála	35	72,92%	+/-12,57%
Hvorki / né	4	8,33%	+/-7,82%
Ósammála	0	0,00%	+/-0,00%
Mjög ósammála	1	2,08%	+/-4,04%
Alls	48	100%	



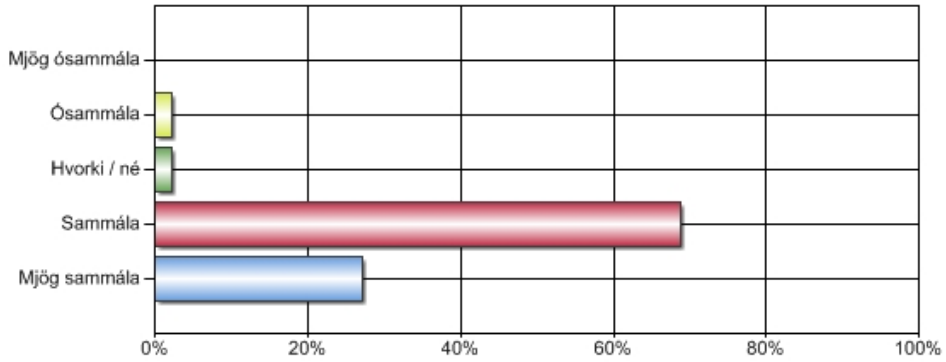
12. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum: : Stefnan sem þitt sveitarfélag hefur markað sér í umhverfismálum getur skilað sér sem hagsbætur fyrir almenning.

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	8	16,67%	+/-10,54%
Sammála	32	66,67%	+/-13,34%
Hvorki / né	8	16,67%	+/-10,54%
Ósammála	0	0,00%	+/-0,00%
Mjög ósammála	0	0,00%	+/-0,00%
Alls	48	100%	



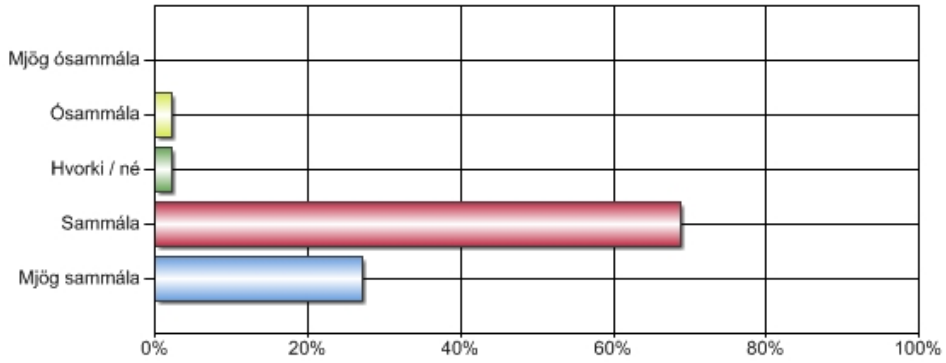
12. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum: : Þegar almenningur er sér meðvitaður um að þeirra sjónarmið eru raunverulega notuð til að marka stefnuna í umhverfismálum er hann viljugri til að taka þátt í þeirri vinnu.

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	13	27,08%	+/-12,57%
Sammála	33	68,75%	+/-13,11%
Hvorki / né	1	2,08%	+/-4,04%
Ósammála	1	2,08%	+/-4,04%
Mjög ósammála	0	0,00%	+/-0,00%
Alls	48	100%	



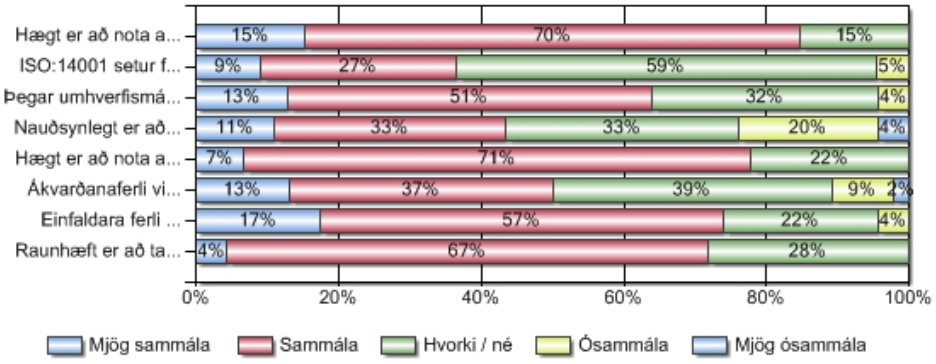
12. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum: : Þegar almenningur fær tækifæri til að taka þátt í að móta stefnu í umhverfismálum gæti náðst betri árangur í þeim málaflokki.

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	13	27,08%	+/-12,57%
Sammála	33	68,75%	+/-13,11%
Hvorki / né	1	2,08%	+/-4,04%
Ósammála	1	2,08%	+/-4,04%
Mjög ósammála	0	0,00%	+/-0,00%
Alls	48	100%	



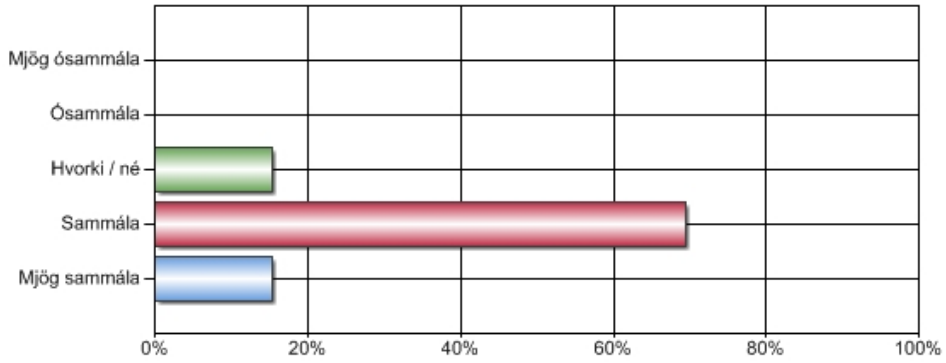
13. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum. Hversu sammála ertu?

	Fjöldi	Mjög sammála	Sammála	Hvorki / né	Ósammála	Mjög ósammála
Hægt er að nota aðferðir eins og til dæmis aðferðafræði verkefnisstjórnunar til þess að ná betri árangri í umhverfismálum.	46	15%	70%	15%	0%	0%
ISO:14001 setur fram sérstaka mælikvarða á frammistöðu í umhverfismálum	44	9%	27%	59%	5%	0%
Þegar umhverfismál eru til skoðunar í þínu sveitarfélagi er haft samráð við alla hagsmunaaðila	47	13%	51%	32%	4%	0%
Nauðsynlegt er að nota alltaf sömu aðferðafræðina þegar umhverfisáhrif eru metin	46	11%	33%	33%	20%	4%
Hægt er að nota aðferðir verkefnisstjórnunar til að mæla árangur á frammistöðu í umhverfismálum	45	7%	71%	22%	0%	0%
Ákvarðanaferli við mat á umhverfisáhrifum er of flókið og viðamikið	46	13%	37%	39%	9%	2%
Einfaldara ferli við mat á umhverfisáhrifum myndi auka frammistöðu í umhverfismálum	46	17%	57%	22%	4%	0%
Raunhæft er að tala um að nota aðferðir verkefnisstjórnunar við umhverfisstjórnun	46	4%	67%	28%	0%	0%



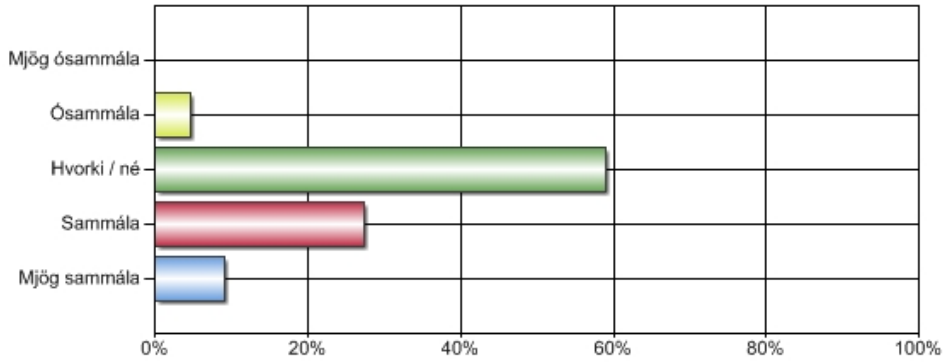
13. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum. Hversu sammála ertu?: Hægt er að nota aðferðir eins og til dæmis aðferðafræði verkefnisstjórnunar til þess að ná betri árangri í umhverfismálum.

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	7	15,22%	+/-10,38%
Sammála	32	69,57%	+/-13,30%
Hvorki / né	7	15,22%	+/-10,38%
Ósammála	0	0,00%	+/-0,00%
Mjög ósammála	0	0,00%	+/-0,00%
Alls	46	100%	



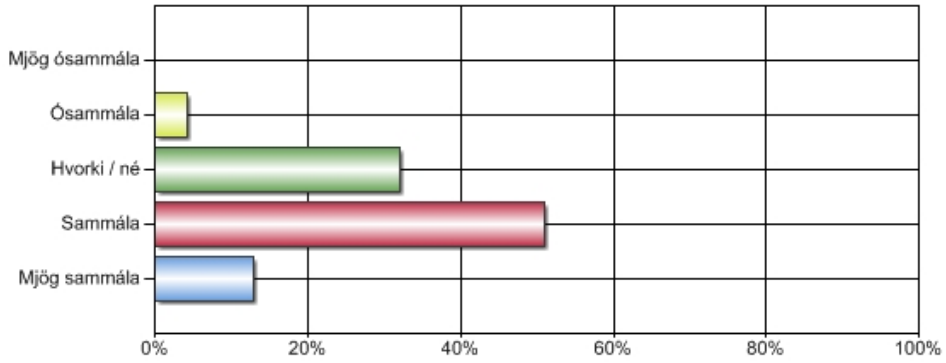
13. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum. Hversu sammála ertu?: ISO:14001 setur fram sérstaka mælikvarða á frammistöðu í umhverfismálum

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	4	9,09%	+/-8,49%
Sammála	12	27,27%	+/-13,16%
Hvorki / né	26	59,09%	+/-14,53%
Ósammála	2	4,55%	+/-6,15%
Mjög ósammála	0	0,00%	+/-0,00%
Alls	44	100%	



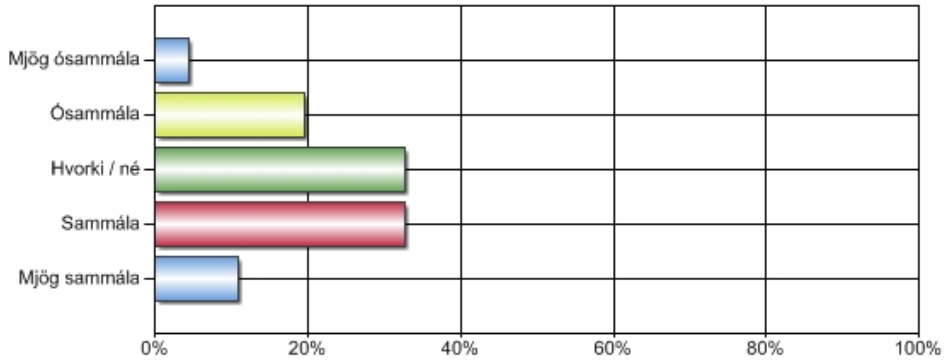
13. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum. Hversu sammála ertu?: Þegar umhverfismál eru til skoðunar í þínu sveitarfélagi er haft samráð við alla hagsmunaaðila

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	6	12,77%	+/-9,54%
Sammála	24	51,06%	+/-14,29%
Hvorki / né	15	31,91%	+/-13,33%
Ósammála	2	4,26%	+/-5,77%
Mjög ósammála	0	0,00%	+/-0,00%
Alls	47	100%	



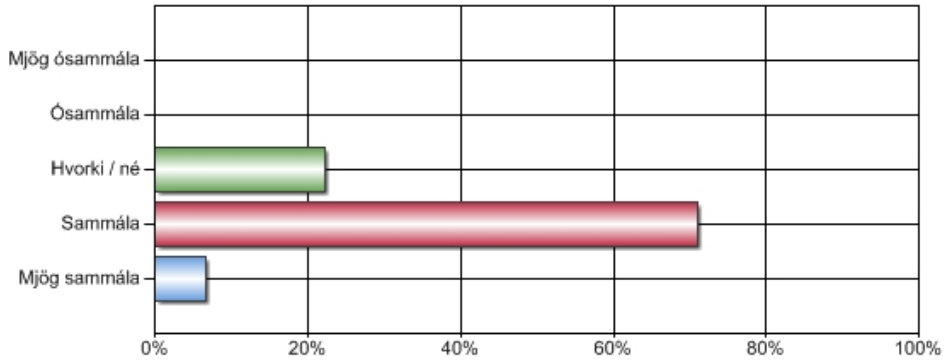
13. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum. Hversu sammála ertu?: Nauðsynlegt er að nota alltaf sömu aðferðafræðina þegar umhverfisáhrif eru metin

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	5	10,87%	+/-8,99%
Sammála	15	32,61%	+/-13,55%
Hvorki / né	15	32,61%	+/-13,55%
Ósammála	9	19,57%	+/-11,46%
Mjög ósammála	2	4,35%	+/-5,89%
Alls	46	100%	



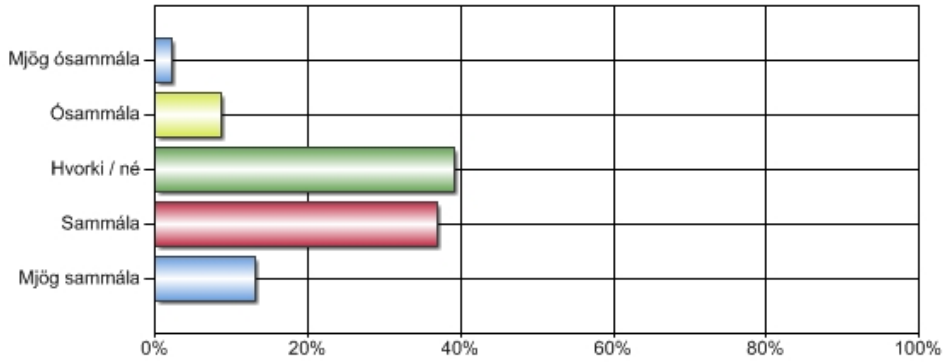
13. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum. Hversu sammála ertu?: Hægt er að nota aðferðir verkefnisstjórnunar til að mæla árangur á frammistöðu í umhverfismálum

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	3	6,67%	+/-7,29%
Sammála	32	71,11%	+/-13,24%
Hvorki / né	10	22,22%	+/-12,15%
Ósammála	0	0,00%	+/-0,00%
Mjög ósammála	0	0,00%	+/-0,00%
Alls	45	100%	



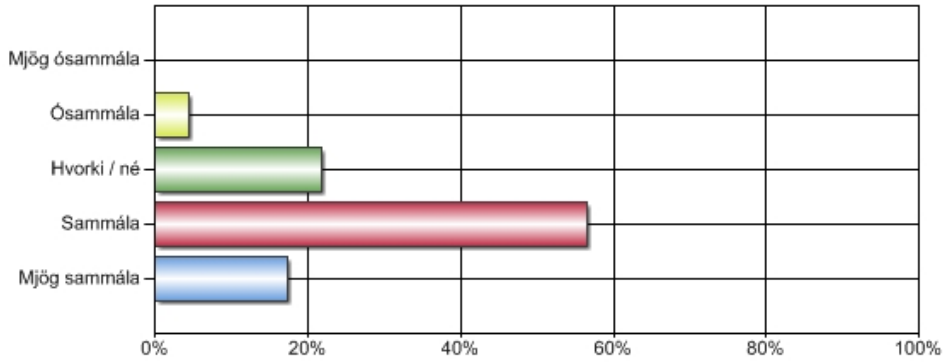
13. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum. Hversu sammála ertu?: Ákvarðanaferli við mat á umhverfisáhrifum er of flókið og viðamikið

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	6	13,04%	+/-9,73%
Sammála	17	36,96%	+/-13,95%
Hvorki / né	18	39,13%	+/-14,10%
Ósammála	4	8,70%	+/-8,14%
Mjög ósammála	1	2,17%	+/-4,21%
Alls	46	100%	



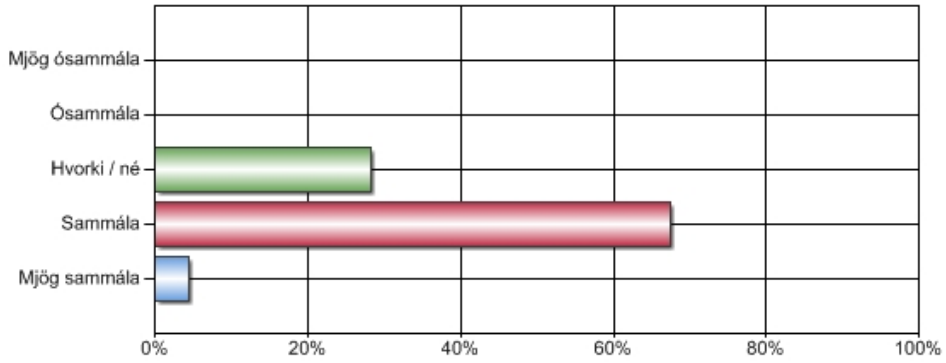
13. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum. Hversu sammála ertu?: Einfaldara ferli við mat á umhverfisáhrifum myndi auka frammistöðu í umhverfismálum

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	8	17,39%	+/-10,95%
Sammála	26	56,52%	+/-14,33%
Hvorki / né	10	21,74%	+/-11,92%
Ósammála	2	4,35%	+/-5,89%
Mjög ósammála	0	0,00%	+/-0,00%
Alls	46	100%	



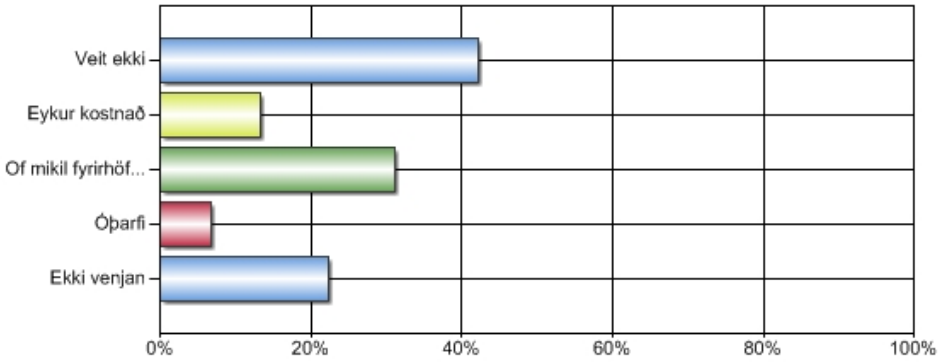
13. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum. Hversu sammála ertu?: Raunhæft er að tala um að nota aðferðir verkefnisstjórnunar við umhverfisstjórnun

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög sammála	2	4,35%	+/-5,89%
Sammála	31	67,39%	+/-13,55%
Hvorki / né	13	28,26%	+/-13,01%
Ósammála	0	0,00%	+/-0,00%
Mjög ósammála	0	0,00%	+/-0,00%
Alls	46	100%	



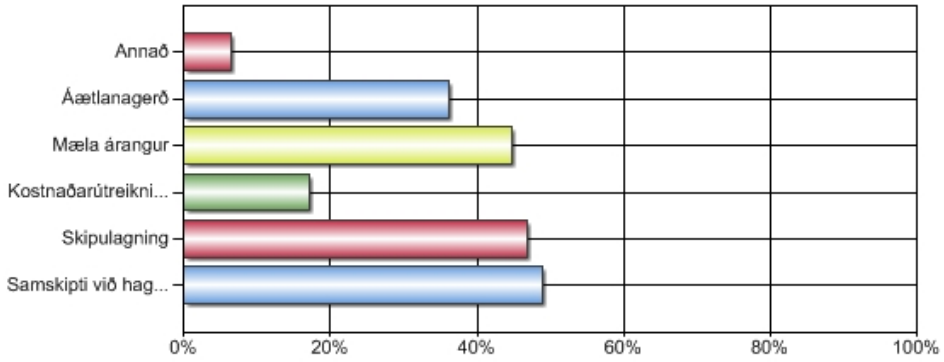
14. Hvers vegna er umhverfisstjórnun ekki meira samtvinnuð grunnþáttum verkefnisstjórnunar í ljósi ofantaldra fullyrðinga?

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Ekki venjan	10	22,22%	+/-12,15%
Óþarfi	3	6,67%	+/-7,29%
Of mikil fyrirhöfn	14	31,11%	+/-13,53%
Eykur kostnað	6	13,33%	+/-9,93%
Veit ekki	19	42,22%	+/-14,43%
Alls	52	100%	



15. Hver eftirtalinna atriða sem tilheyra aðferðafræði verkefnisstjórnunar telur þú að gætu helst bætt aðferðir við að meta umhverfisáhrif eða nýst í umhverfisstjórnun?

Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Samskipti við hagsmunaaðila	23	48,94%	+/-14,29%
Skipulagning	22	46,81%	+/-14,27%
Kostnaðarútreikningar	8	17,02%	+/-10,74%
Mæla árangur	21	44,68%	+/-14,21%
Áætlanagerð	17	36,17%	+/-13,74%
Annað	3	6,38%	+/-6,99%
Alls	94	100%	



Annað:

- er staðsett í liltu sveitarfélagi, hef ekki skoðað hvað felst í hefðbundinni aðferðafræði verkefnastjórnar, en sjálfsagt er hún notuð ómeðvitað. svaraði því ekki nema hluta kannanarinnar. gangi þér vel
- gildi heimamanna sé meira metið en eitthverra pappakassa sem aldrei hafa stigið út af skrifstofu sinni í Reykjavík
- Tel árangursríkara að gera rannsóknir á náttúrunni á skipulagsstigi s.s. deiliskipulags eða aðalskipulags, heldur en beina rannsóknum á mat á umhverfisáhrifum framkvæmda. Kostaðar af framkvæmdaaðila og oftast of seint að snúa til baka frá röskun eða eyðileggingu náttúrusvæða.

Upplýsingar um hvernig tölfræði skýrslunnar er reiknuð

A. Töflur

Niðurstöður fyrir hverja spurningu eru birtar í töflum og gröfum. Texti spurningarinnar sést efst í töflunni. Í töflunni eru birtir allir svarmöguleikar ásamt fjölda þeirra sem velja hvern svarmöguleika, prósentutölur og vikmörk hlutfalla. Töflurnar sem birta samkeyrslu (greiningu) spurninga sýna heildarfjölda svarenda sem svara tiltekinni spurningu, sniðmengi svara eru þeir þátttakendur sem svara báðum spurningum, þ.e. þeirri sem verið er að greina og þeirri sem verið er að greina eftir. Niðurstöður útreikninganna má birta ýmist eða bæði sem prósentu- eða fjöldatölu.

B. Vikmörk hlutfalla

Til að meta gildi niðurstaða rétt þarf grundvallarskilning á vikmörkum hlutfalla. Vikmörk hlutfalla segja til um hversu nálægt rétt niðurstaða er með einhverri tiltekinni vissu. Sem stendur segir þessi tala okkur með 95% vissu að hlutfall svarenda liggi á útreiknuðu bili +/- vikmörkin (hlutfall svara getur auðvitað ekki orðið minna en 0% eða meira en 100%). Dæmi: sé hlutfall svarmöguleikans “mjög gott” 78% og vikmörkin 4,5%, er vitað með 95% vissu að hlutfallið liggur á bilinu, 73,5% - 82,5% (78% +/- 4,5%).

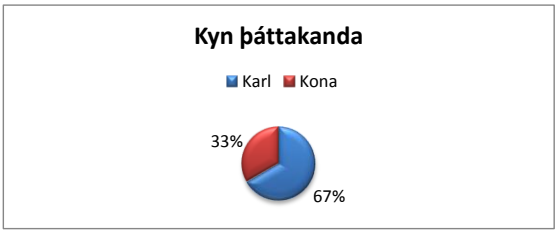
C. Gröf

Gröf í Outcome eru ýmist súlurit, kökurit eða línurit. Með þeim myndrænan hátt meta niðurstöður hverrar spurningar.

Appendix C: Basic data obtained from questionnaire in firms- April.2012

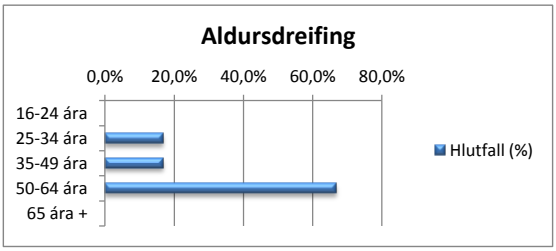
1. Hvert er kyn þitt?

Svar	Fjöldi	Hlutfall (%)
Karl	4	66,7%
Kona	2	33,3%
Alls	6	100,0%



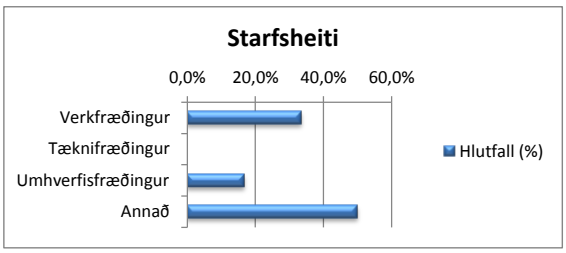
2. Hver er aldur þinn?

Svar	Fjöldi	Hlutfall (%)
16-24 ára	0	0,0%
25-34 ára	1	16,7%
35-49 ára	1	16,7%
50-64 ára	4	66,7%
65 ára +	0	0,0%
Alls	6	100,0%



3. Hvert er starfsheiti þitt?

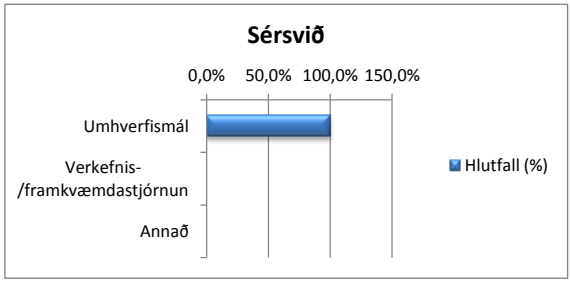
Svar	Fjöldi	Hlutfall (%)
Verkfræðingur	2	33,3%
Tæknifræðingur	0	0,0%
Umhverfisfræðingur	1	16,7%
Annað	3	50,0%
Alls	6	100,0%



Annað:
Jarðfræðingur/sviðsstjóri
Umhverfisstjóri
Vistfræðingur

4.Hvert er sérsvið þítt?

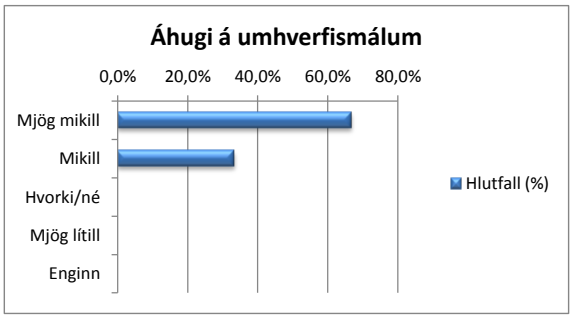
Svar	Fjöldi	Hlutfall (%)
Umhverfismál	6	100,0%
Verkefnis-/framkvæmdastjórnun	0	0,0%
Annað	0	0,0%
Alls	6	100,0%



Annað:
Jarðhitaverkefni

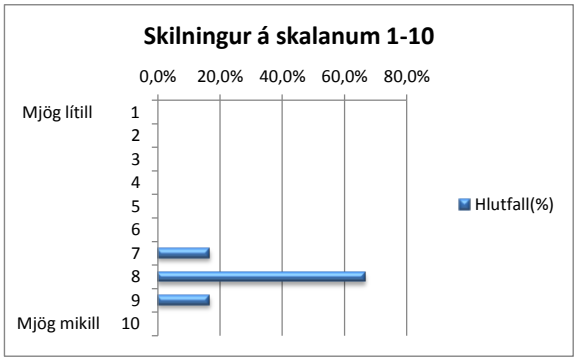
5. Hver er áhugi þinn á umhverfismálum?

Svar	Fjöldi	Hlutfall (%)
Mjög mikill	4	66,7%
Mikill	2	33,3%
Hvorki/né	0	0,0%
Mjög lítill	0	0,0%
Enginn	0	0,0%
Alls	6	100,0%



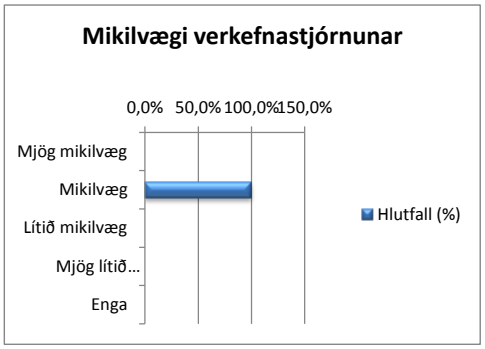
6. Hver er skilningur þinn á aðferðafræði í hefbundinni verkefnisstjórnun á skalanum 1-10?

Svar		Fjöldi	Hlutfall(%)
Mjög lítill	1	0	0,0%
	2	0	0,0%
	3	0	0,0%
	4	0	0,0%
	5	0	0,0%
	6	0	0,0%
	7	1	16,7%
	8	4	66,7%
	9	1	16,7%
Mjög mikill	10	0	0,0%
Alls		6	100,0%



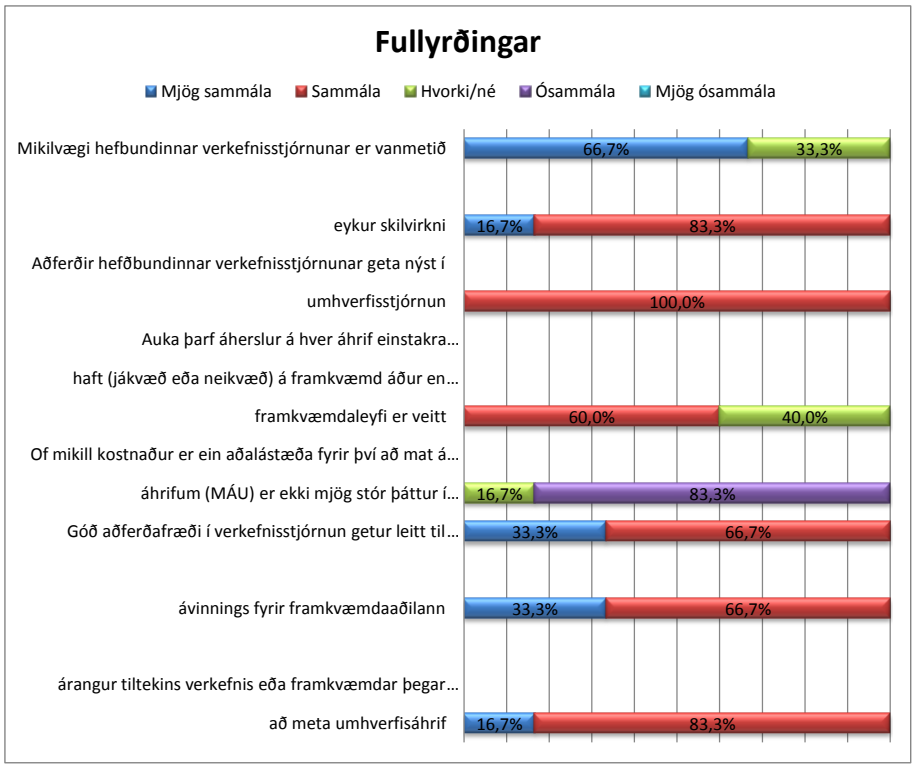
7. Hversu mikilvæga telur þú þörfina á því að nota hefbundna aðferðafræði við verkefnastjórnun?

Svar	Fjöldi	Hlutfall (%)
Mjög mikilvæg	0	0,0%
Mikilvæg	6	100,0%
Lítið mikilvæg	0	0,0%
Mjög lítið mikilvæg	0	0,0%
Enga	0	0,0%
Alls	6	100,0%



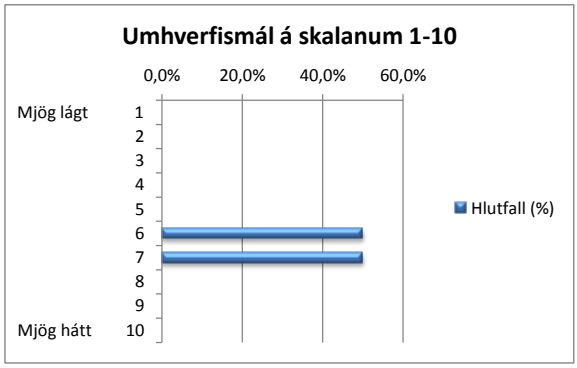
8. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum:

	Fjöldi	Mjög sammála	Sammála	Hvorki/né	Ósammála	Mjög ósammála
Mikilvægi hefbundinnar verkefnisstjórnunar er v	6	66,7%		33,3%		
Að nota hefðbundna verkefnisstjórnun við stjórn framkvæmda eykur skilvirkni	6	16,7%	83,3%			
Aðferðir hefðbundinnar verkefnisstjórnunar geta nýst í umhverfisstjórnun	6		100,0%			
Auka þarf áherslur á hver áhrif einstakra umhverfisþátta geta haft (jákvæð eða neikvæð) á framkvæmd áður en almennt framkvæmdaleyfi er veitt	5		60,0%	40,0%		
Of mikill kostnaður er ein aðalástæða fyrir því að mat á umhverfis-áhrifum (MÁU) er ekki mjög stór þáttur í framkva	6			16,7%	83,3%	
Góð aðferðafræði í verkefnisstjórnun getur leitt t	6	33,3%	66,7%			
Góð aðferðafræði í verkefnisstjórnun getur leitt til efnahagslegs ávinnings fyrir framkvæmdaaðilann	6	33,3%	66,7%			
Það er hentugt að nota aðferðir verkefnisstjórnunar við að mæla árangur tiltekins verkefnis eða framkvæmdar þegar kemur að því að meta umhverfisáhrif	6	16,7%	83,3%			



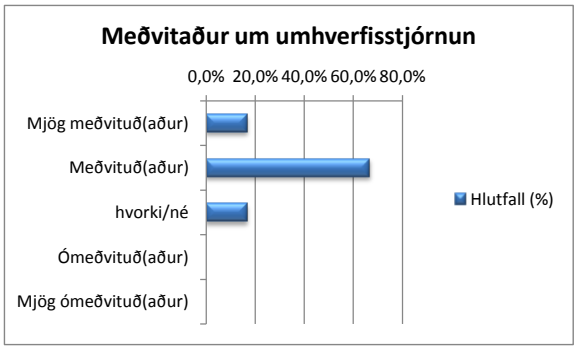
9. Hve hátt skrifuð eru umhverfismálin almennt í þjóðfélaginu á skalanum 1-10?

Svar		Fjöldi	Hlutfall (%)
Mjög lágt	1	0	0,0%
	2	0	0,0%
	3	0	0,0%
	4	0	0,0%
	5	0	0,0%
	6	3	50,0%
	7	3	50,0%
	8	0	0,0%
	9	0	0,0%
Mjög hátt	10	0	0,0%
Alls		6	100,0%



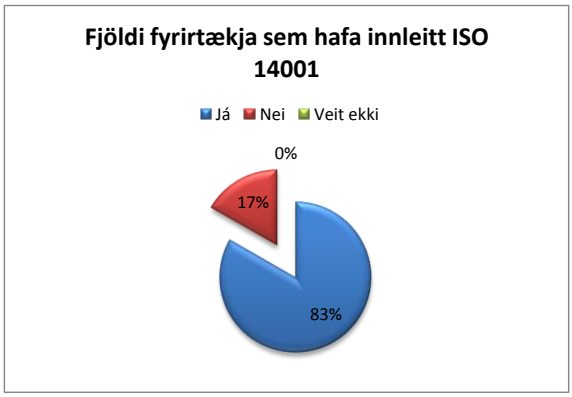
10. Hversu mikið meðvituð(aður) ert þú um umfang umhverfisstjórnunar almennt í sveitarfélögum?

Svar	Fjöldi	Hlutfall (%)
Mjög meðvituð(aður)	1	16,7%
Meðvituð(aður)	4	66,7%
hvorki/né	1	16,7%
Ómeðvituð(aður)	0	0,0%
Mjög ómeðvituð(aður)	0	0,0%
Alls	6	100,0%



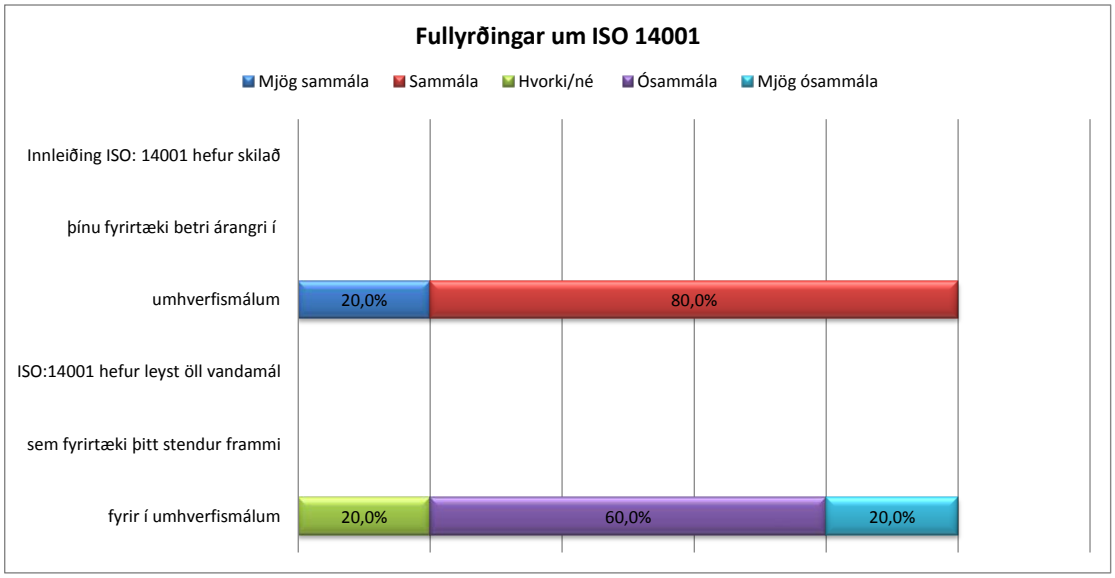
11. Hefur þitt fyrirtæki innleitt ISO:14001, staðal um umhverfisstjórnun?

Svar	Fjöldi	Hlutfall (%)
Já	5	83,3%
Nei	1	16,7%
Veit ekki	0	0,0%
Alls	6	100,0%



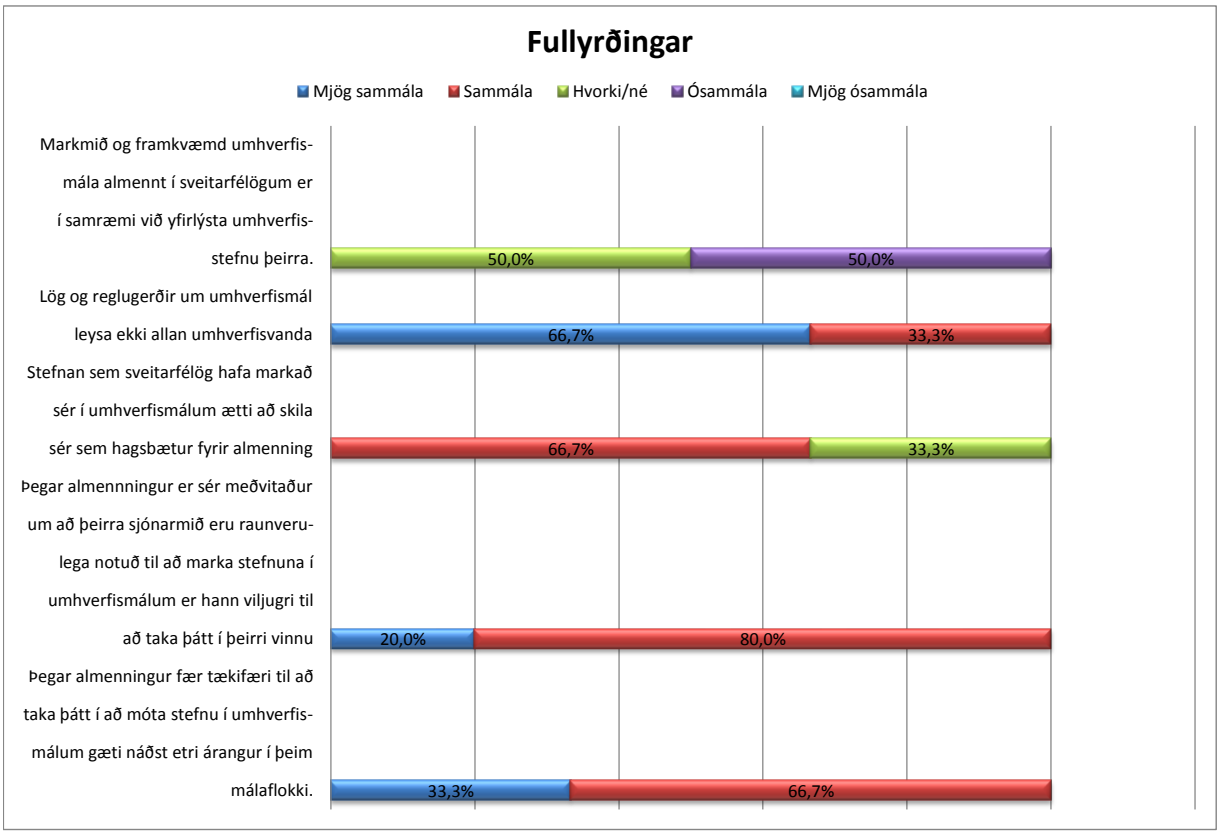
11a. Fullyrðingar um ISO 14001:

	Fjöldi	Mjög sammála	Sammála	Hvorki/né	Ósammála	Mjög ósammála
Innleiðing ISO: 14001 hefur skilað þínu fyrirtæki betri árangri í umhverfismálum	5	20,0%	80,0%			
ISO:14001 hefur leyst öll vandamál sem fyrirtæki þitt stendur frammi fyrir í umhverfismálum	5			20,0%	60,0%	20,0%



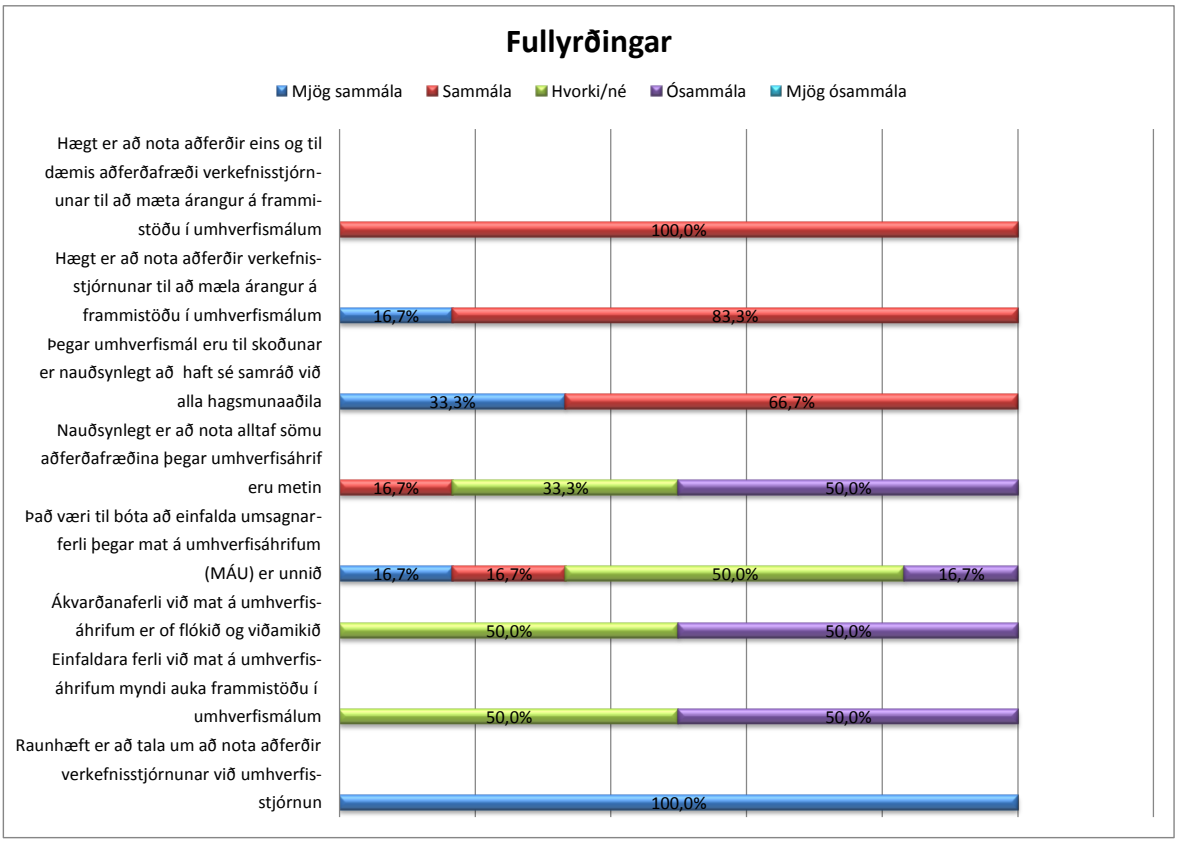
12. Gerið grein fyrir skoðun ykkar á eftirfarandi fullyrðingum

	Fjöldi	Mjög sammála	Sammála	Hvorki/né	Ósammála	Mjög ósammála
Markmið og framkvæmd umhverfismála almennt í sveitarfélögum er í samræmi við yfirlýsta umhverfisstefnu þeirra.	4			50,0%	50,0%	
Lög og reglugerðir um umhverfismál leysa ekki allan umhverfisvanda	6	66,7%	33,3%			
Stefnan sem sveitarfélög hafa markað sér í umhverfismálum ætti að skila sér sem hagsbætur fyrir almenning	6		66,7%	33,3%		
Þegar almennningur er sér meðvitaður um að þeirra sjónarmið eru raunverulega notuð til að marka stefnuna í umhverfismálum er hann viljugri til að taka þátt í þeirri vinnu	5	20,0%	80,0%			
Þegar almenningur fær tækifæri til að taka þátt í að móta stefnu í umhverfismálum gæti náðst etri árangur í þeim málaflokki.	6	33,3%	66,7%			



13. Vinsamlegast gerið grein fyrir skoðun ykkar á eftirfarandi full-yrðingum

	Fjöldi	Mjög sammála	Sammála	Hvorki/né	Ósammála	Mjög ósammála
Hægt er að nota aðferðir eins og til dæmis aðferðafræði verkefnisstjórn-unar til að mæta árangur á frammi-stöðu í umhverfismálum	6		100,0%			
Hægt er að nota aðferðir verkefnis-stjórnunar til að mæla árangur á frammistöðu í umhverfismálum	6	16,7%	83,3%			
Þegar umhverfismál eru til skoðunar er nauðsynlegt að haft sé samráð við alla hagsmunaaðila	6	33,3%	66,7%			
Nauðsynlegt er að nota alltaf sömu aðferðafræðina þegar umhverfisáhrif eru metin	6		16,7%	33,3%	50,0%	
Það væri til bóta að einfalda umsagnar-ferli þegar mat á umhverfisáhrifum (MÁU) er unnið	6	16,7%	16,7%	50,0%	16,7%	
Ákvarðanaferli við mat á umhverfis-áhrifum er of flókið og viðamikið	6			50,0%	50,0%	
Einfaldara ferli við mat á umhverfis-áhrifum myndi auka frammistöðu í umhverfismálum	6			50,0%	50,0%	
Raunhæft er að tala um að nota aðferðir verkefnisstjórnunar við umhverfis-stjórnun	6	100,0%				

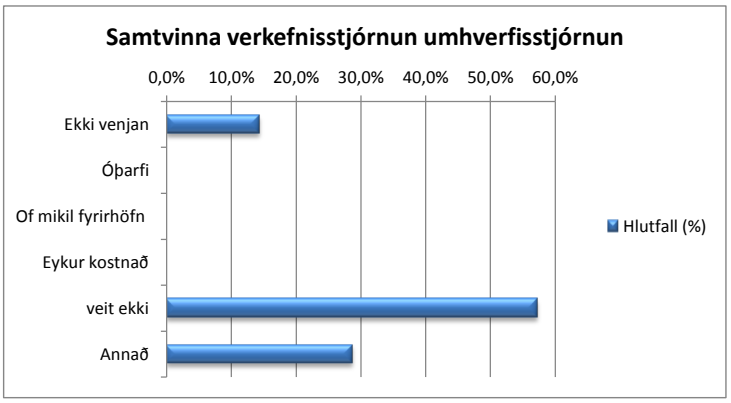


14. Hvers vegna er umhverfisstjórnun ekki meira samtvinnuð grunnþáttum verkefnisstjórnunar í ljósi ofantaldra fullyrðinga?

Hægt að merkja við fleirri en en valkost

Svar	Fjöldi	Hlutfall (%)
Ekki venjan	1	14,3%
Óþarfi	0	0,0%
Of mikil fyrirhöfn	0	0,0%
Eykur kostnað	0	0,0%
veit ekki	4	57,1%
Annað	2	28,6%
Alls	7	100,0%

Annað:
Vanþekking
Þekkingar skortur /lítill skílningur

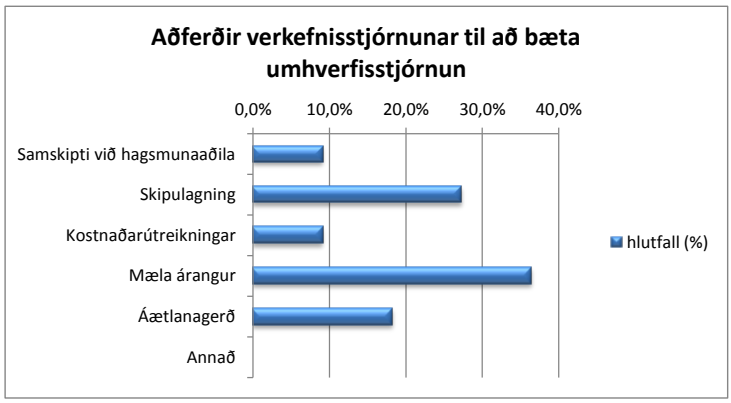


15. Hver eftirtalinna atriða sem tilheyra aðferðafræði verkefnisstjórnunar telur þú að gætu helst bætt aðferðir við að meta umhverfisáhrif eða nýst í umhverfiis-stjórnun?

Hægt að merkja við fleirri en en valkost

Svar	Fjöldi	hlutfall (%)
Samskipti við hagsmunaaðila	1	9,1%
Skipulagning	3	27,3%
Kostnaðarútreikningar	1	9,1%
Mæla árangur	4	36,4%
Áætlanagerð	2	18,2%
Annað	0	0,0%
Alls	11	100,0%

Annað:
Öll þessi atriði eru viðhöfð þegar metin eru umhverfisáhrif
Skipulagning og áætlanagerð er ekki óskylt



Appendix D: Data from questionnaire linked to question 5

Lokaverkefni í framkvæmdastjórnun

(Lokaverkefni í framkvæmdastjórnun 18.5.2012)

Lýsing á Rannsókn

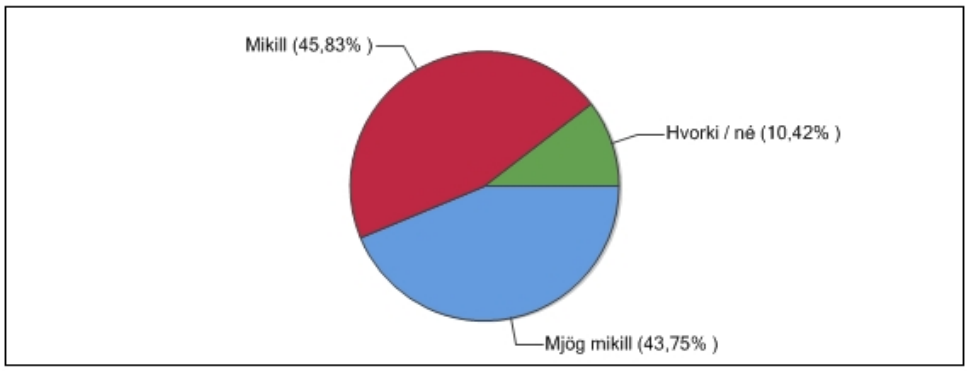
Nafn	Lokaverkefni í framkvæmdastjórnun 18.5.2012
Gerð virk	28.2.2012 - 13:07
Gerð óvirk	9.3.2012 - 14:20
Tímabil	28.2.2012 - 9.3.2012
Aðferð	Tölvupóstkönnun
Númer könnunar	18851

Stærð úrtaks og svörun

Upphaflegt úrtak	66
Fjöldi svarenda	48
Svöruðu ekki	18
Svarhlutfall	72,73%

5. Hver er áhugi þinn á umhverfismálum?

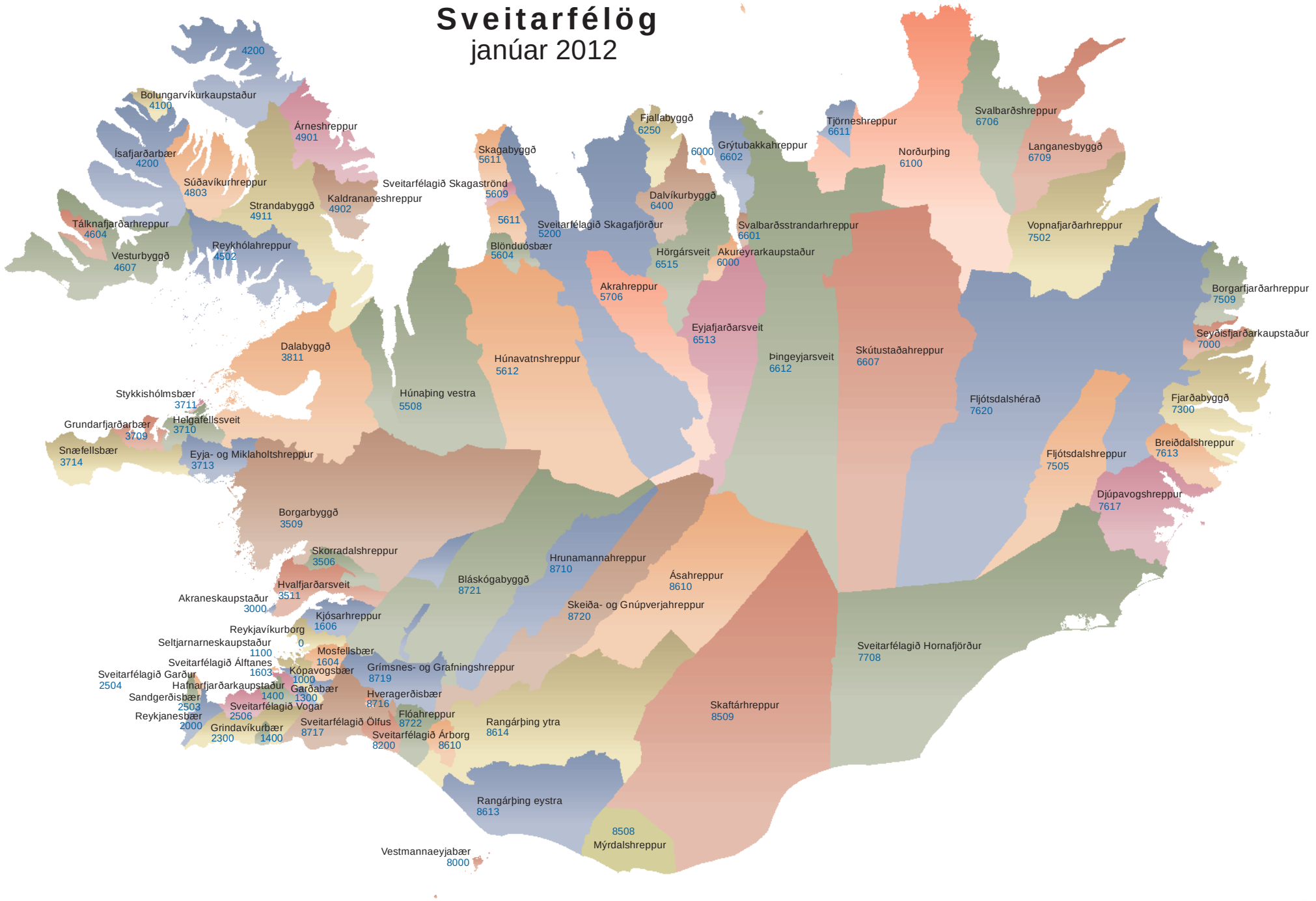
Svar	Fjöldi	Hlutfall	Vikmörk hlutfalla
Mjög mikill	21	43,75%	+/-14,03%
Mikill	22	45,83%	+/-14,10%
Hvorki / né	5	10,42%	+/-8,64%
Mjög lítill	0	0,00%	+/-0,00%
Enginn	0	0,00%	+/-0,00%
Alls	48	100%	



1. Hvert er kyn þitt?	Fjöldi	Sniðmengi svara	Mjög mikill	Mikill	Hvorki / né	Mjög lítill	Enginn
Karl	33	33	45,45%	42,42%	12,12%	0,00%	0,00%
Kona	15	15	40,00%	53,33%	6,67%	0,00%	0,00%

Appendix E: Map showing all the municipalities in Iceland (paper size -A3)

Sveitarfélög
janúar 2012



Appendix F: List of the municipal participants in the interviews.

All the interviews were conducted in April 2012.

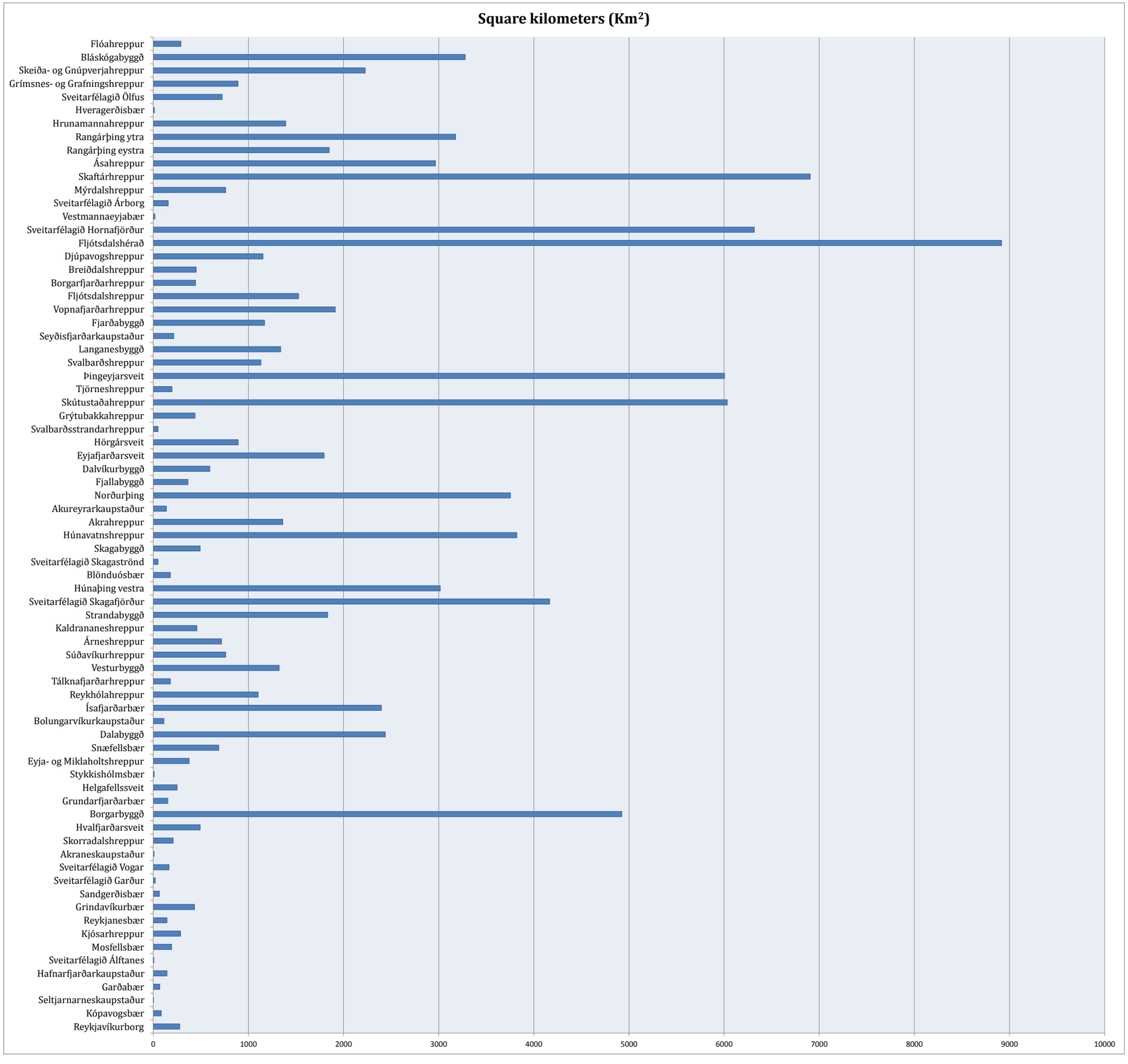
1. 4200 Ísafjarðarbær (1 interview) - Umhverfisfulltrúi (Environmental representative).
2. 3609 Borgarbyggð (1 interview) – Formaður umhverfis- og skipulagsnefndar (Manager of environmental and planning committee).
3. 1000 Kópavogur (1 interview) – Sviðsstjóri umhverfissviðs (director of environmental department).
4. 1604 Mosfellsbær (1 interview) – Umhverfisstjóri (Environmental Manager)
5. 8000 Vestmannaeyjarbær (1 interview) – Framkvæmdastjóri umhverfis- og framkvæmdasviðs (Director of environmental- and projects divison)
6. 3000 Akraneskaupstaður (1 interview) Framkvæmdastjóri skipulags- og umhverfisstofu (Director of planning and environmental office)
7. 3511 Hvalfjarðarsveit (1 interview) – Skipulags- byggingarfulltrúi (Municipality manager/approves building permissions).
8. 0 Reykjavík (2 interviews) – Verkefnisstjóri umhverfissviðs og starfsmaður umhverfis- og samgöngusviðs. (Project manager in environmental department, representative from environmental and transportation division)
9. 7620 Fljótdalshérað (1 interview) – Verkefnisstjóri umhverfismála (Project manager in environmental issues).

Appendix G: Municipal participants in the questionnaire

Sveitarfélaganúmer	Sveitarfélag	netfang	Sími	Samþykkja þátttöku
0	Reykjavíkurborg	hronn.hrafnsdottir@reykjavik.is	411-3000	x
1000	Kópavogsbær	holmfridurth@kopavogur.is	570-1500	x
1100	Seltjarnarneskaupstaður	postur@seltjarnarnes.is	595-9100	x
1300	Garðabær	erlabil@gardabaer.is	525-8500	x
1400	Hafnarfjarðarkaupstaður	berglindg@hafnarfjordur.is	585-5500	x
1603	Sveitarfélagið Álftanes	palmi@alftanes.is	550-2300	x
1604	Mosfellsbær	tomas@mos.is	525-9700	x
1606	Kjósarhreppur	oddviti@kjos.is	566-7100	x
2000	Reykjanesbær	gudlaugur.h.sigurjonsson@reykjanesbaer.is	421-6700	x
2300	Grindavíkurbær	robert@grindavik.is	420-1100	x
2503	Sandgerðisbær	birgir@sandgerdi.is	420-7555	x
2506	Sveitarfélagið Vogar	sigurdur@vogar.is	440-6200	x
3000	Akraneskaupstaður	akranes@akranes.is	433-1000	x
3506	Skorradalshreppur	khuldag@hive.is	437-0005	x
3511	Hvalfjarðarsveit	hjortur@hvalfjardarsveit.is	433-8500	x
3609	Borgarbyggð	ragnar@borgarbyggd.is	433-7100	x
3710	Helgafellssveit	bb07@simnet.is	438-1485	x
3711	Stykkishólmsbær	gyda@stykkisholmur.is	433-8100	x
3713	Eyja- og Miklaholtshreppur	eyjaogmiklaholtshreppur@vortex.is	435-6665	x
3811	Dalabyggð	bogi@dalir.is	430-4700	x
4100	Bolungarvíkurkaupstaður	elias@bolungarvik.is	450-7000	x
4200	Ísafjarðarbær	umhverfisfulltrui@isafjordur.is	450-8000	x
4502	Reykhólahreppur	sveitarstjori@reykholar.is	434-7880	x
4604	Tálknafjarðarhreppur	talknafjordur@talknafjordur.is	456-2539	x
4607	Vesturbyggð	asthildur@vesturbyggd.is	450-2300	x
4803	Súðavíkurhreppur	omar@sudavik.is	450-5900	x
4901	Árneshreppur	arneshreppur@simnet.is	451-4001	x
4902	Kaldrananeshreppur	drangsnes@drangsnes.is	451-3277	x
4911	Strandabyggð	sveitarstjori@strandabyggd.is	451-3510	x
5200	Sveitarfélagið Skagafjörður	shi@skagafjordur.is	455-6000	x
5508	Húnaþing vestra	umhverfisstjori@hunathing.is	455-2400	x
5604	Blönduósbær	agust@blonduos.is	455-4700	x
5609	Sveitarfélagið Skagaströnd	magnus@skagastrond.is	455-2700	x
5611	Skagabyggð	hafnir@simnet.is	452-4163	x
5612	Húnavatnshreppur	jens@emax.is	452-4660	x
6000	Akureyrarkaupstaður	jbg@akureyri.is	460-1000	x
6100	Norðurþing	gaukur@nordurthing.is	464-6100	x
6250	Fjallabyggð	valur@fjallabyggd.is	464-9100	x

6400	Dalvíkurbyggð	helga@dalvikurbyggd.is	460-4900	x
6513	Eyjafjarðarsveit	jonas@esveit.is	463-0600	x
6515	Hörgársveit	gudmundur@horgarsveit.is	461-5474	x
6601	Svalbarðsstrandarhreppur	jonhroi@svalbardsstrond.is	462-4320	x
6607	Skútustaðahreppur	gudrunm@myv.is	464-4163	x
6611	Tjörneshreppur	skrifstofa@tjorneshreppur.is	464-1970	x
6612	Þingeyjarsveit	tryggvi@thingeyjarsveit.is	464-3322	x
6706	Svalbarðshreppur	svalbardshreppur@svalbardshreppur.is	895-8747	x
6709	Langanesbyggð	sveitarstjori@langanesbyggd.is	468-1220	x
7000	Seyðisfjarðarkaupstaður	daniel@sfk.is	470-2300	x
7300	Fjarðabyggð	johann.edvald@fjardabyggd.is	470-9000	x
7502	Vopnafjarðarhreppur	steini@vopnafjardarhreppur.is	473-1300	x
7509	Borgarfjarðarhreppur	borg@eldhorn.is	472-9999	x
7613	Breiðdalshreppur	palli@breiddalur.is	470-5560	x
7620	Fljótsdalshérað	freyr@egilsstadir.is	470-0700	x
7708	Sveitarfélagið Hornafjörður	runars@hornafjordur.is	470-8007	x
8000	Vestmannaeyjabær	olisnorra@vestmannaeyjar.is	488-2000	x
8200	Sveitarfélagið Árborg	marta@arborg.is	480-1900	x
8508	Mýrdalshreppur	sveitarstjori@vik.is	487-1210	x
8509	Skaftárhreppur	sveitarstjori@klaustur.is	487-4840	x
8614	Rangárþing ytra	runar@rang.is	488-7000	x
8710	Hrunamannahreppur	jon@fludir.is	480-6600	x
8716	Hveragerðisbær	gfb@hveragerdi.is	483-4000	x
8717	Sveitarfélagið Ölfus	gudni@olfus.is	480-3800	x
8719	Grímsnes- og Grafningshreppur	hordur@gogg.is	486-4400	x
8720	Skeiða- og Gnúpverjahreppur	oddviti@skeidgnup.is	486-6014	x
8721	Bláskógabyggð	valtyr@blaskogabyggd.is	486-8808	x
8722	Flóahreppur	floahreppur@floahreppur.is	480-4370	x

Appendix H: Different size of the municipalities


Square kilometers (Km²)
Flóahreppur
Bláskógabyggð
Skeiða- og Gnúpverjahreppur
Grímsnes- og Grafningshreppur
Sveitarfélagið Ölfus
Hveragerðisbær
Hrunamannahreppur
Rangárþing ytra
Rangárþing eystra
Ásahreppur
Skaftárhreppur
Mýrdalshreppur
Sveitarfélagið Árborg
Vestmannaeyjabær
Sveitarfélagið Hornafjörður
Fljótsdalshérað
Djúpavogshreppur
Breiðdalshreppur
Borgarfjarðarhreppur
Fljótsdalshreppur
Vopnafjarðarhreppur
Fjarðabyggð
Seyðisfjarðarkaupstaður
Langanesbyggð
Svalbarðshreppur
Þingeyjarsveit
Tjörneshreppur
Skútustaðahreppur
Grýtubakkahreppur
Svalbarðsstrandarhreppur
Hörgársveit
Eyjafjarðarsveit
Dalvíkurbyggð
Fjallabyggð
Norðurþing
Akureyrarkaupstaður
Akrahreppur
Húnavatnshreppur
Skagabyggð
Sveitarfélagið Skagaströnd
Blönduósbær
Húnaþing vestra
Sveitarfélagið Skagafjörður
Strandabyggð
Kaldrananeshreppur
Árneshreppur
Súðavíkurhreppur
Vesturbyggð
Tálknafjarðarhreppur
Reykhólahreppur
Ísafjarðarbær
Bolungarvíkurkaupstaður
Dalabyggð
Snæfellsbær
Eyja- og Miklaholtshreppur
Stykkishólmsbær
Helgafellssveit
Grundarfjarðarbær
Borgarbyggð
Hvalfjarðarsveit
Skorradalshreppur
Akraneskaupstaður
Sveitarfélagið Vogar
Sveitarfélagið Garður
Sandgerðisbær
Grindavíkurbær
Reykjanesbær
Kjósarhreppur
Mosfellsbær
Sveitarfélagið Álftanes
Hafnarfjarðarkaupstaður
Garðabær
Seltjarnarneskaupstaður
Kópavogsbær
Reykjavíkurborg
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000

Population in municipalities