



# SUSTAINABLE DEVELOPMENT STRATEGY

**DINGLI 2020**

Dingli Local Council





The Dingli Local Council is grateful to the Government of Malta for its support which helped in the preparation of this document. However, the views expressed are those of the authors alone.

Published by:

## Dingli Local Council

© 2010 All rights reserved. No reproduction, copy or transmission of this publication may be made without the written permission of the publishers.

You can find Dingli Local Council at [www.dingli.gov.mt](http://www.dingli.gov.mt)

Designed and typeset by Glenn Micallef.

Printed by Print It Printing Services.





# Sustainable Development Strategy

## Dingli 2020

Edited by Marvin Formosa



Dingli Local Council



Government of Malta







## Message by the Prime Minister, Hon. Lawrence Gonzi

The notion of sustainable development is at the heart of my Government's work programme. Our challenge is to ensure continuous economic development sustained by an active society with particular attention to the environment.

Government believes that sustainable development is both person-based and community-oriented. Our localities and local councils are best placed to ensure that we can reach our national targets. To this end, Government launched a scheme to assist councils in becoming pioneers of sustainable development.

The Dingli Local Council, through the publication of this strategy is underlining its commitment to local sustainable development. From tapping renewable energy to promoting agri-tourism to environmental resource management, this strategy will act as a road-map which will see Dingli embrace sustainable development.

This local initiative is complementary to Government's national efforts. It is through such partnerships that we can reach our goal of sustainable development.

On behalf of Government I would like to commend Dingli's local council for its work and commitment.

Lawrence Gonzi  
Prime Minister







## **Message by the Leader of the Opposition, Hon. Joseph Muscat**

I would like to congratulate the Dingli Local Council for its participation in this positive initiative. Undoubtedly, coming up with a sustainable development strategy, is a great challenge for all Local Councils in our country, considering their limited human and financial resources. Such a task becomes surely much more challenging for a small Council like that of Dingli, but your Council has set an example, and is paving the way for what should definitely be the way forward for our local governments in the coming years. And I am in no doubt that other Local Councils will also perform a very good job.

The list of issues which were touched upon by the Dingli Council in the formulation of its sustainable development strategy is impressive. Rural tourism, alternative energy, traffic management and environmental resource management are only just a few of the many topics which were analysed. I am sure that now that the necessary studies have been finalised, the great potential of Dingli, albeit a small locality, became more evident than ever. And I firmly believe that the same will happen when, in the near future, other Local Councils will follow in the footsteps of the Dingli Council.

It is definitely in the interest of our country, our localities, our families and of our citizens, to have our Local Councils embarking on long term professional planning initiatives such as the one taken up by the Dingli Council, aimed solely at improving our quality of life.

Joseph Muscat  
Leader of the Opposition









## Message by the Mayor of Dingli, Ian Borg

It is my pleasure to present herein Dingli's first Sustainable Development Strategy.

The birth of this Strategy derives from my ambition to provide the Dingli Local Council with a robust framework on which to base its decision-making and to guarantee the residents that no decisions will be taken without measuring their impact on sustainable development. Acts of decision-making without any consideration of their long-term impact must be made a thing of the past, both in Dingli and in other Local Councils.

Dingli's first Sustainable Development Strategy is intended to perform as an inspiring vision for the next ten years. Hence, the year 2020 in the sub-title.

Over the next ten years this Strategy will prove indispensable to the Dingli Local Council in its goal to protect the sustainability of its territorial borders and ensure social and economic growth in line with a string environmental sensibility. The Strategy will act as a robust forceful guideline decree that aids us in meeting both the current and future needs of the community whilst safeguarding its social, economic, and environmental infrastructure for future generations. I am positive that this Strategy will also serve to maximise Dingli's contribution to our national tourism industry by directing and attracting tourists to exceptional and distinctive locations that Dingli is proud to contain.

This Strategy has no political agenda, and was undertaken in collaboration with residents and voluntary organisations. This was undertaken to ensure that the vision and aspirations presented here accurately reflected the community's priorities, which now comprise the spirit and character of this Strategy.

It is now our challenge to implement these ambitious recommendations in order to meet the diverse needs of Dingli's existing residents and improve their quality of life while also safeguarding the prospects of future generations. For this purpose, it is necessary that the representative of national and local politics, as well as the community residents themselves, join forces and commit themselves towards its implementation.

I would like to express my profound gratitude for the financial support granted by the Government of Malta to draw up this Strategy. Gratitude also goes to all the experts involved in writing the reports, and to all those citizens who participated in and contributed to the interviews. I thank you for giving us your time to improve the wellbeing and prosperity of our community.

Dingli is the town I am proud to call home.

Ian Borg  
Mayor of Dingli







## Editor's preface

The general public in Malta is at a crucial cross-road in local policy : Should an unsustainable development project be encouraged because of its economic returns? Or should they contest it because of its negative impact on the nation's ecological and social fabric? Without doubt, the contributions found in this policy action plan on sustainable development confirm the urgent need to continue balancing economic, social and environmental concerns so as to ensure equitable and continued development for both present and future generations.

Although this policy action plan focuses on a particular local area in the Maltese Islands - that of Dingli - there is no doubt that communities are central to the success of sustainable development strategies. When thinking about the scale at which sustainable development is possible one fundamental answer is the following motto : think globally, act locally. It is surely encouraging to witness the positive contributions made by the state towards increased sustainability. However, for such policies to experience real and tangible success they must be supported at the grass-root levels of society. And where is it best to encourage and motivate the grass-roots to comply and energise national policies of sustainable development if not through the community. Local community governments, as opposed to their national counterparts, have a greater degree of understanding of the local problems which may range from land use to political representation to education. They are therefore better able to implement and adjust to aspects of sustainability in the social and environmental arenas. It is through community leaders that it becomes possible to alter people's ingrained cultural conceptions of what constitutes the good life, forged by years of colonialism and the flood of overt and covert messages conveyed by the media. It is imperative that both the community and nation refrain from killing the goose that lays the golden eggs. Indeed, it is futile to continue increasing the number of tourists if the uncontrolled tourism development is degrading and hence lowered the quality of the very same product that sustains it. Similarly, it is pointless to continue augmenting the construction and quarrying sector. Besides causing the rapid depletion of limestone, one of the few natural resources of the island, the sector is responsible for 88% of Malta's solid waste. Looking at vacant buildings in one's locality (there are 35,000 dwellings in the whole of Malta, 23% of the total) one must ask whether this is all worth the candle. I believe that reflecting upon the ongoing rape of one's community edifices will aid citizens to agree that despite this sector's contribution to 5.3% of the GDP ensures, the state must nevertheless apply some brakes to the construction of buildings.

The goal of this policy action plan is to act as a catalyst for engendering a clear vision of what sustainable development implies and a strong conviction that it can deliver on what it promises - namely, an improved quality of life for all Maltese and global citizens. Hopefully, it acts as a strategy of adult education for sustainable development which enables citizens to understand the various implications of sustainability, equip them with the urge to participate in decision-making forums, and develop the right attitudes and values that prompt them to take action. It is against such a yardstick that the success or failure of this document should be measured.

Before giving way to the contributions present in the document, I wish to take the opportunity to thank Ian Borg, Mayor of Dingli, since without his perseverance and organisational skills this project would have not been conceived or completed. Gratitude also goes to all the authors in this volume whose contribution is testament to the exceptional human capital that is present and available in the Maltese Islands.

Marvin Formosa PhD

1 July 2010







# Contents

Notes on Editor and Contributors

- Chapter 1      Dingli : A Historical Overview (Mario Micallef)
- Chapter 2      Sustainable Development (Marvin Formosa)
- Chapter 3      Social and Cultural Implications (Marvin Formosa)
- Chapter 4      Criminal Issues (Jacqueline Azzopardi Cauchi, Saviour Formosa, and Sandra Scicluna)
- Chapter 5      Health and Well-Being (Marianne Massa)
- Chapter 6      Environmental Resource Management (Emmanuel Sinagra)
- Chapter 7      A Review of Land Use Policies and Recommendations for Improvement (David Mifsud Parker, mc<sup>2</sup> architects)
- Chapter 8      Sustainable Tourism in Rural Living
- Part I : A programme for sustainable tourism (David Pace)
- Part II : Conservation and upgrading projects (David Mifsud Parker, mc<sup>2</sup> architects)
- Part III : Technological Enhancements to Sustainable Tourism  
(Jacqueline Azzopardi Cauchi, Saviour Formosa, and Sandra Scicluna)
- Chapter 9      Energy audit of the office building, Dingli Local Council (Jonathan Scerri, Econing Engineering Consultancy Ltd.)
- Chapter 10     National Minimum Requirements on Energy Performance for the New Proposed Civic Centre Dingli  
(Jonathan Scerri, Econing Engineering Consultancy Ltd.)
- Chapter 11     Energy Audit for Public Areas in the Vicinity of Dingli (Jonathan Scerri, Econing Engineering Consultancy Ltd.)
- Chapter 12     Sustainable Energy Action Plan, Dingli (Jonathan Scerri, Econing Engineering Consultancy Ltd.)
- Chapter 13     Infrastructural Projects for Sustainable Development (Michael J. Camilleri, mc<sup>2</sup> architects)
- Chapter 14     Traffic Management Plan (Mario Ellul)
- Chapter 15     Dingli Urban Conservation Area Upgrading Project (David Vassallo)







## Notes on Editor and Contributors

**Marvin Formosa** is a lecturer at the European Centre of Gerontology, University of Malta. He also serves as a Visiting Lecturer at the Department of Sociology and the International Institute of Ageing (United Nations - Malta). His research interests include sustainable development, class analysis, critical gerontology and educational gerontology, on which he has published articles in local and international journals. Recent books include *Lifelong Learning in Later Life* (Sense, forthcoming - with Brian Findsen), *Class Dynamics in Later Life* (Lit Verlag, 2009) and *Supporting Family Carers of Older Persons in Europe* (Lit Verlag, 2006 - with Joseph Troisi). Dr. Formosa was a member of the Scientific Committee of the XIXth Congress of the International Association on Gerontology and Geriatrics (Paris, 2009), and is currently a Visiting Scholar at the Adult Education and Counselling Department at the Ontario Institute for Studies in Education, University of Toronto.

**Jacqueline Azzopardi Cauchi** is the Director of the Institute of Criminology and a Senior Lecturer. Dr Azzopardi Cauchi holds a first degree in Education, a postgraduate Diploma in Probation Services, a Masters in Criminal Justice (Leicester University - UK) and a Ph.D. (Leicester University - UK) in policing. She is a member of the Police Academy Board and has also acted as an assistant to prisoners on the Prison's Board of Appeals for about five years. She is the current Maltese National Research and Science Correspondent for Cepol. Dr Azzopardi Cauchi has published and contributed to publications/articles on : culture, policing, policewomen, police culture, violence, women and politics as well as youths and delinquency. Dr Azzopardi Cauchi is also involved in the Dingli community - where she is a local councilor and the President of the Dingli Primary School council.

**Michael J. Camilleri** graduated from University of Malta in 2005 in Architecture and Civil Engineering. He specialised in structures and civil engineering obtaining a first placing in his final thesis presentation on 'The behaviour of laterally loaded piles in the building construction'. Architect Camilleri attended the School of Arts to further develop his artistic knowledge. He also attended a course in Caring for Historic Houses recently held by the Heritage Malta. Architect Camilleri worked with a local renowned architectural firm, and was responsible for the architectural and structural design of various projects ranging from residential and commercial projects to industrial and urban development. Architect Camilleri is also responsible for a major urban development project as a site architect. This has provided Architect Camilleri with practical experience in the coordination of all related aspects in the field of architectonics. His research interests include the behaviour of piles when constructed in a row to support and resist the effects of lateral loadings by means of tests on a purposely built model that simulates the natural environment and conditions existing where piles are used in construction projects.

**Mario Ellul** is a Road Engineering consultant. He studied Architecture and Civil Engineering and Road Engineering at undergraduate and post-graduate levels (respectively) at the University of Malta. Currently, Mr. Ellul is reading for another post-graduate degree in the Conservation Technology of Masonry Buildings at the University of Malta. Mr. Ellul served as an Architect and Civil Engineer with the Road Department and Manager Projects within the Malta Transport Authority for past last nine years.

**Saviour Formosa** is a Senior Lecturer within the Institute of Criminology, University of Malta. He has a Ph.D. in spatio-temporal environmental criminology. Dr. Formosa's main area of research is spatio-temporal analysis of crime and its social and physical relationships using spatial information systems. He lectures in various faculties at the University of Malta. His main expertise lies in the implementation of cross-thematic approaches and uses to the data cycle and management with emphasis in the thematic and spatial data structures, visualisation, modelling, web-mapping, analysis and dataflow management and reporting. He is a Member of the Applied Criminology Centre at the University of Huddersfield. Dr. Formosa has developed the [www.crimemalta.com](http://www.crimemalta.com) website which covers ongoing news and crime-related statistics in Malta

**Marianne Massa** heads the Health Promotion Unit after having contributed immensely to its development over the last 20 years. Ms Massa is an Environmental Health Officer and later attained her Masters in Health Promotion from the University of Southampton in UK. Ms Massa has vast experience developing the settings approach including the Health Promoting School, the Healthy Workplace and the Healthy Cities initiative, and is the local Focal Point in relevant EU forums. She carries out research in Young People's Health and is the Principal Investigator for the WHO Health Behaviour of School Aged Children Study. Ms Massa's other areas of interest include Women's Health, Breast Care, Sexual Health Education, Alcohol and Emotional Health. Ms Massa is a visiting lecturer at the University of Malta.

**Mario Micallef** is a history graduate and currently works as a broadcast journalist. Born on 22nd August 1978, Micallef studied at the Dingli Primary School; the Archbishop's Seminary; Gian Frangisk Abela Junior College; and the University of Malta from where he graduated B.A. (Hons.) in History. As part of the requirements for this degree, he submitted a dissertation entitled "Studies in Local History After 1800: Dingli." In November 2001, Micallef joined the Catholic Church media as a full-time journalist with Radio RTK. He used to contribute also for the weekly newspaper *Il-GENSillum*. After three years, he moved to Public Broadcasting Services Ltd, which operates the Maltese national television and radio stations. Apart from contributing to the daily news bulletin, he is part of the production team of *DISSETT*, a weekly current affairs programme. Mario Micallef is active in various structures of the Dingli Parish and is a member of the Pastoral and Parochial Council and secretary of the External Feast Committee.

**David Mifsud Parker** holds a degree in Civil Engineering and Architecture, a diploma in Conservation Studies and is currently reading his Masters degree in Conservation Studies. He has also specialised in urban planning and planning legislation in Malta and in Europe. Architect Mifsud Parker worked with various local architecture firms and was responsible for a wide range of practices varying from concept designs, urban planning, report writing, site and project management and conservation monitoring. His research interests lie in the field of urban planning includes a thesis on the *Changing Urban Fabric of Siggiewi* - a typical village in Malta. The study demonstrates a number of relationships between





the urban forms and society. Architect Mifsud Parker is currently carrying out a Masters thesis on the structural strength of timber beams used in conservation projects, and is a full member of the Maltese Chamber of Architects.

**David Pace** is a qualified Laboratory Scientist, journalist and a teacher. He has been working in the environmental field since 1985 and in 1988 was elected Secretary General of Zghazagh għall-Ambjent. A year later he traveled on the Greenpeace boat Sirius for two weeks to protest against nuclear vessels in the Mediterranean. Mr. Pace has been a regular environmental correspondent on a number of local newspapers including the Malta Independent on Sunday, the Times, MaltaToday, it-Torca and L-Orizzont. He specialises in the development of more sustainable forms of tourism in Malta and the biodiversity of the Maltese Islands. He wrote the Walk on the Wild Side series of nature walks on the Times Weekender feature, which up to this day remain one of few series of walks that focus on Maltese biodiversity. Mr. Pace taught geography and science for fifteen years at a secondary level and is currently lecturing at the Institute of Tourism Studies on Food Science and Tourism Sustainability. He also lectures fourth year Tourism Studies students at the University of Malta on the Environmental Impacts of Tourism and is working as a consultant with the University of Tetovo to establish ecotourism in Macedonia.

**Jonathan Scerri** is a professional electrical engineer graduated from the University of Malta in 1996 and is currently reading for a Masters Degree in Renewable Energy Systems Technology. He is also an assessor for energy performance in buildings. He has worked for nine years in the energy industry, both in generation and distribution branches. Following that, he has been employed in plant engineering with a leading pharmaceutical manufacturing company with a particular accent on building services. In 2008, he has jointly established Econing Engineering Consultancy Ltd. specializing in energy management consultancy. The company operates in the fields of energy auditing and renewable energy technology consultancy.

**Sandra Scicluna** is a lecturer with the Institute of Criminology, University of Malta. Her Ph.D. research was about prison rehabilitation in Malta. She lectures in the following areas: transnational crime, punishment, substance abuse, the world of corrections, dealing with foreign offenders and organised crime. Dr. Scicluna has past experience working as a Probation Officer and was elected as member of the CEP Board. She is also a member of the Police Academy Board and has acted as an assistant to prisoners on the Prison Appeals Tribunal. In addition, she acts as a consultant to the Ministry of Justice and Home Affairs and is Deputy National Science Correspondent for CEPOL. Dr. Scicluna has produced and contributed to various publications on topics which include substance abuse, domestic violence and the development of probation and prisons in Malta.

**Emmanuel Sinagra** graduated with a B.Sc. in Chemistry with Environmental Science from the University of Kent at Canterbury in 1986. A year later he obtained his M.Sc. in Surface and Colloids from the University of Bristol. He continued his studies at doctoral level at Bristol and obtained his Ph.D. in 1993. He took up a lectureship at the Department of Chemistry of the University of Malta and in 1998 he became senior lecturer. In 2008, Dr. Sinagra became Head of the Department of Chemistry. Dr. Sinagra's teaching specialisations are in the fields of Physical Chemistry and Environmental Chemistry. His research is in the field of Colloids and Interfaces but is largely focused on proteins in solution. Besides carrying out his academic work, Dr. Sinagra is an environmental consultant focusing on air quality and has been involved in a number of environmental impact assessments involving air quality.

**David Vassallo** is an Architect and Civil Engineer by profession. He obtained his first degree from the University of Malta in 2000 and subsequently graduated as Master of Science in Road Engineering in 2004 with a specialisation in road and traffic related issues (including road design, traffic management, procurement and project management). He is currently employed as Manager Projects within the Roads and Infrastructure Directorate of the Transport Authority, is a member of the MEPA's Development Control Commission (Division B) and sits on MEPA's Urban Improvement Fund (UIF) Committee. Over the years, Perit Vassallo has attended a number of local and international conferences, seminars and courses related to the profession and to his area of specialisation, particularly the Sécurité Routière seminar held in Paris, France and the Road Safety Conference organised by the United Nations at their European Headquarters in Geneva, Switzerland. Perit Vassallo is also very active in the Dingli community where he has served as a local councillor for the past five years and is also an active member in various local voluntary organisations.









**Chapter 1**

# **Dingli: A Historical Overview**

Mario Micallef





The picturesque village of Dingli is situated in the western part of Malta, eight miles away from Valletta and close to the nearby locality of Rabat. This village stands on the most elevated plateau in the Islands, 800 feet above sea level, and its coast is completely isolated from the sea by the imposing cliffs which forms a stretch of natural fortifications guarding this part of the archipelago.

Although for decades the community residing in Dingli made part of the parish of Hal Tartarni, which stood in the vicinity of this village, the gradual abandonment of this settlement resulted in the suppression of its parish in the late 1530s. Consequently, the Rabat parish priest became responsible for the spiritual needs of Dingli residents. However, in view of the bad state of the roads and the primitive means

of transport, he found it difficult to travel to this village and frequently it was impossible for him to attend to his duties, such as the anointing of the sick. Eventually, in 1615 Bishop Baldassere Cagliares established Dingli as a distinct parish dedicated to the Assumption of Our Lady, but during a vacancy in the bishopric, in 1668 the vicar general illegally suppressed this parish. Finally, few months after his episcopal appointment, on 31 December 1678 Bishop Michele Gerolamo Molina re-established the parish of Dingli. Throughout the years leading to the advent of the British in Malta, Dingli shared the same experience of similar remote villages, where the few scores of individuals residing therein lived in basic and poor conditions and maintained themselves through the cultivation of land. In a nutshell, one can fairly depict pre-1800 Dingli as an isolated village struggling to make ends meet.

## The 1800s

The sense of security and stability established by the Knights of the Order of St. John during their stay in Malta reflected itself on demographic figures for the Maltese Islands. Whilst 20,000 persons were enumerated in 1530, by 1798 the total population reached 114,000. On the other hand, whilst in 1687 Dingli housed a population of 356 persons, in 1790 the population amounted to 373. In fact, during Hospitaller Malta, contrary to the national trend Dingli did not experience a substantial population growth and one can fairly state that the population of this village remained almost static, with few increments over a long period of time. This factor occurred principally due to a policy adopted by the Order of St. John since its arrival in Malta. This policy, which eventually altered the pattern of life in the Island, involved the severe reduction of the significant role previously played by the nearby city of Mdina and the consequent extensive development of the area around the Grand Harbour, thus rendering Dingli into a perfectly isolated village. The significant demographic achievements registered on a national basis during Hospitaller Malta were disrupted by the relatively short sojourn of the French. This period was characterised by warfare, disease and famine, to the extent that by the time the French surrendered in September 1800, hundreds of individuals perished through sickness and hunger. Undoubtedly, these signs were neither favourable nor encouraging to population growth. However, life within a purely rural and remote environment such as Dingli was not directly hit by the French occupation. In fact, by 1811 the population of Dingli amounted to 425 persons, that is a 13.9% increase over the 1790 population figure.

Population figures for the Maltese Islands during this period registered a steady increase, though between 1861 and 1881 a deceleration in the rate of demographic growth was recorded. Contrary to the national trend, an analysis of the population of Dingli shows that it was characterised by a period of intense demographic instability. When compared to the 1842 demographic figure, the population of Dingli in 1851 recorded a decrease of 16 persons. By 1851, life in a rural ambience remained extremely difficult, mainly due to two severe droughts that hit the Maltese Islands during the preceding decade and the decline of the cotton industry which deprived rural areas from an important source of income. Notwithstanding the considerable reduction in the number of births caused by such depression, during the period 1841-1850 a mean annual natural increase of 6.5 persons was recorded. Therefore, it seems clear that the migratory movement that affected the population of Dingli from the mid-1820s intensified

throughout the 1840s, thus contributing to the above-mentioned population decrease.

When compared to the 1851 population figure for Dingli, the next decennial census recorded a population increase of 46.3%. This large-scale demographic growth occurred partially due to a substantial excess of births over deaths during the past decade, thus resulting in a mean natural increase of 10.9 persons annually. Another factor that contributed towards such large demographic increase involved a considerable number of returned migrants who re-settled back within their native village. These returned migrants were attracted by a wave of prosperity that uplifted Malta in the mid-fifties and the subsequent decade. One must point out that the Crimean campaign led to a substantial increase in the demand for agricultural products and eventually wages of agricultural labourers jumped by approximately half. Furthermore, due to the cotton famine caused by the American Civil War, this product re-emerged temporarily as Malta's staple. Undoubtedly, such circumstances proved crucial in encouraging those persons who in times of depression left Dingli to return back to their native village, cultivate their lands and benefit from this economic boom.



While the rate of population growth for the Maltese Islands between 1861 and 1881 declined to relatively low levels, Dingli experienced a 22.4% decrease in its population. On a national level, these years coincided with the outbreak of violent epidemics that proved detrimental

to population growth. Such infectious disease included the cholera of 1865 and 1867, where those known to have become ill numbered 4,139 of whom about half succumbed, and the smallpox of 1870-71 having 7,000 persons attacked of whom 700 died. The remote village of Dingli was affected only by the cholera of 1865. This epidemic cost the life of one victim from Dingli, Nicholas Grixti, who died on 28 August 1865 and was buried in a cemetery outside Mdina. Nevertheless, although the above-mentioned large-scale epidemics had an insignificant effect on Dingli, this village experienced the very same reduction in the absolute natural increase as occurred on the national bases. In fact, such reduction resulted mainly from a rise in the number of deaths, particularly among infants during the years 1861-1870, followed by a decrease in the amount of births. Notwithstanding the reduction in the natural increase, one must remark that during the period 1861-1881, the total excess of births over deaths for Dingli amounted to 160 persons. Therefore, it seems clear that the considerable reduction in

population figures for Dingli during this two-decade period resulted from a wave of massive migration.

Following this period of demographic turbulence, the decade following 1881 paved the way for years of continuous population growth in Dingli. During the three-decade period 1881-1911 the population on both national and locality bases increased rapidly. However, when compared to the national bases Dingli experienced a higher rate of demographic growth. In fact, one must remark that by 1911 Dingli housed a population of 963 persons, which reflects a 108.9% increase over the 1881 population figure. Since changes in population are a function of births, deaths and migration, the trends of each of these and their relative contributions to such growth must be analysed closely. As time went by Dingli retained more of its native population, to such an extent that by 1911 the Dingli natives and resident at Dingli featured 86.8% of the total number of Dingli residents.

## The 1900s

The unbalanced gender structure in favour of females, registered both in 1921 and 1931, shows that male migrants from Dingli participated in the above-mentioned mass migratory movement. One must recall that on a national level an excess of females reflected the much larger amount of males who opted for external migration. Evidence indicates that by 1912 a small group of persons from Dingli were already residing in Australia. Later on, during the eight-year period 1923-1931, this village contributed 33 migrants to Australia and Canada. Nevertheless, when compared to other localities Dingli's share of migrants was relatively low. In fact, this external migratory movement did not affect population growth for Dingli, since throughout the two-decade period 1911-1931 the population of this village increased by 30.6%. Thus, it seems clear that such demographic growth resulted mainly from a considerable natural increase.

Situated on the opposite side of the strategically targeted area, the remote village of Dingli entailed the necessary requisite highly needed by refugees from other localities. In fact, hundreds of refugees particularly from the Cottonera and Paola migrated towards this village, to such an extent that during the three-year period of hostilities the population of Dingli nearly doubled. One must point out that war casualties within this village were limited to three individuals, a soldier of the Durham Light Infantry who was stationed within this village and two civilians. Consequently, when compared to the 1,544 civilians who lost their lives through air attacks, Dingli's share of civilian casualties amounted to a mere 0.1%. Moreover, contrary to the national trend the population of Dingli continued to register an excess of births over the number of deaths, to such an extent that during years of warfare a mean annual natural increase of 15 persons was recorded. Evidence indicates that unlike other localities life within this village was not heavily disrupted and hardship less intense.

During the intercensal period 1931-1948 the population of the entire archipelago underwent a rapid increase amounting to 18.8%. On the other hand, when compared to the national figures Dingli experienced a much larger boom in its demographic growth. In fact, by 1948 this village housed a population of 1,869 persons, which reflects a 48.6% intercensal increase. In less than twenty-four hours from Italy's declaration of war against Britain and France on 10 June 1940, Italian aircraft conducted their first attack on Malta. Immediately, these Islands witnessed a large exodus of people from urban areas surrounding the Grand Harbour and other nearby suburban localities to the rural districts. One must point out that by May 1941, 55,000 people were living away from their regular residence. This large-scale internal migratory movement to areas of relative security resulted in a radical alteration within the demographic set-up of the Maltese Islands. An analysis of the population of Malta during the three-year period of hostilities indicates that demographic growth was completely halted. Since the Second World War brought the outward migratory movement from Malta to a standstill, it seems clear that the above-mentioned disruption within demographic figures resulted from an excess of deaths over the number of births. In fact, these years ushered a considerable reduction in the amount of births, a trend which reached its peak in 1942 when the lowest birth rate during the past century was recorded. Furthermore, war casualties, malnutrition and disease eventually contributed towards a substantial increase in mortality.

Through the Allied assault upon Sicily in June 1943, the Maltese Islands were completely out of the theatre of hostilities. The disruption in population growth caused by the Second World War was immediately overshadowed by a substantial increase in the excess of births over the number of deaths. In fact, during the following five-year period the mean annual rate of natural increase amounted to 18 per 1000 living. These signs of demographic stability resulted mainly from a rapid decline in the number of deaths particularly among infants, to such an extent that infant mortality dropped sharply from 345 per 1000 live births in 1942 to 116 in 1944. On the other hand, the Maltese Islands experienced an upsurge in births, the so-called post-war baby boom. Furthermore, although the threat of massive unemployment was evident, due to shipping shortages, administrative difficulties and the large-scale reconstruction programme which was accompanied by well paid jobs, the idea of Maltese natives settling abroad continued to be kept aside. On locality bases, during the five-year period leading to 1948 Dingli was affected by the very same factors which induced demographic growth within the entire archipelago. One must point out that the end of air bombardments on the Maltese Islands ushered an immediate outward movement involving nearly all refugees who found shelter in Dingli during the entire period of hostilities. Nevertheless, one must remark that warfare brought the villager and the townsman

closer together, a factor which definitely left a great impact on various aspects of daily life in Dingli in subsequent years.

An analysis regarding the composition of the population of Dingli in 1948 indicates that besides the 1,250 Dingli natives, a total of 619 immigrants resided within this village. Initially, one must remark that demographic figures indicate that as time went by Dingli managed to retain the majority of its native population. In fact, when taken as a percentage of the total number of Dingli natives, the number of emigrants from Dingli living in various localities in Malta and Gozo amounted to 17.5%, a figure close to that recorded in 1911. On the other hand, in 1948 a total of 601 locally born persons together with 18 foreigners were residing in Dingli. This considerable amount of immigrants constituted 33.1% of the total population of Dingli, a proportion that nearly trebled when compared to the 1911 figure. Once more, the nearby locality of Rabat turned out to be the major contributor of such immigrants, a factor reflecting the high incidence of mixed locality marriages which took place throughout past decades with the couple opting to reside in Dingli. However, one must point out that by 1948 a marked increase in the amount of immigrants from urban and suburban localities was recorded. In their majority, these immigrants were wartime refugees who following their marriage with a Dingli native continued living within this village. Therefore, evidence indicates that the extensive increase in demographic figures for Dingli during the intercensal period 1931-1948 resulted from an uninterrupted increase in natural growth, an influx of migrants to Dingli and the fact that few Dingli natives were lost to other localities.

During the intercensal period 1948-1957 demographic growth for the Maltese Islands declined to relatively low levels. Since the rate of natural increase throughout this nine-year period stood at the same level of that recorded from the end of the Second World War, it seems clear that such deceleration in population growth resulted solely from a large-scale outward migratory movement. In fact, between 1948 and 1957 net migration figures for the entire archipelago amounted to 45,485 migrants. The departure of thousands of Maltese natives, directed almost exclusively towards the English speaking countries, acted as a safety valve to the Island's social and economic problems. One must point out that throughout the years leading to the next decennial census, compiled in 1967, a net outward movement of 44,834 Maltese migrants was recorded. Such large exodus, accompanied by the sharply decreasing birth rate which characterised the 1960s, resulted in a 1.7% intercensal decrease in population figures for the Maltese Islands.

Whilst post-Second World War Malta experienced a large wave of external migration, Dingli was among those localities least affected by this extensive demographic movement. In fact, emigration statistics for the nineteen-year period 1948-1967 indicate that the annual rate of external migrants from Dingli amounted to less than 10 per 1000 inhabitants. Insignificantly affected by the above-mentioned mass migratory movement, one presumes that when compared to the national figures this village recorded a higher rate of demographic growth. Nevertheless, during the decade leading to 1967 Dingli experienced a 12.1% decrease in its population, which in numerical terms reflected a loss of 246 persons. Evidence indicates that the major driving force which induced such decline resulted from an internal migratory movement. One must remark that whilst preceding decades were characterised by continuous demographic growth, this very same increase in population figures for Dingli was not accompanied by an enlargement of the residential area. As a result, since the late 1950s Dingli faced an acute housing problem,

to such an extent that upon their marriage young couples were constrained to abandon their native village and reside within other localities in the Maltese Islands. Moreover, an immediate effect of such internal migratory movement involved a deceleration in the birth rate. Another factor contributing to this drop in population figures involved a substantial reduction in Dingli's boundary with Rabat. In fact, one must point out that whilst in 1957 the land area in square miles amounted to 3.67, by 1967 it declined to 2.74. As a result, by 1967 families who resided in the affected area were enumerated with the population of Rabat.

It is noteworthy that in view of Malta's strict dependence on British military expenditure, the end of hostilities induced a broad acceptance of the idea that Malta would have to generate new forms of economic activity. The need for change became much more evident in the second half of the 1950s, when the British Government relegated Malta's position within the British defence structure. In fact, a rundown in employment with the Services was set into operation and within a short period of time, eventually extended to March 1979, the British defence establishment in Malta was to be completely phased out. To cushion the effects of such radical transformation in Malta's economy, in 1959 the British Government launched an economic development plan. One must remark that during the following three-decade period, successive administrations, though differing in ideologies, adopted the same policy. Moreover, one can fairly state that their basic objective was essentially the same, that of making Malta a viable economic unit, which by its own efforts would provide jobs for those who sought them. In a nutshell, economic diversification led to the rapid expansion of the manufacturing industry and the services sector, thus resulting in new employment opportunities for the inhabitants of these Islands.

Since the end of the Second World War, the conditions of the farming community residing in Dingli experienced a considerable improvement. An important development in this regard took place in 1947, when farmers managed to organise themselves in a co-operative; the Dingli Farmers Co-operative. The major outcome of this initiative involved the collective transportation of agricultural products to the vegetable marketing centre by means of a lorry owned by the same co-operative. This efficient service contrasted heavily with the foregoing practice, whereas each farmer used to transport his surplus, miles away from Dingli, by means of an animal-driven cart. Notwithstanding such progress, by the late 1950s a shift from agricultural activity was already evident. In fact, during the period 1931-1957, whilst population figures for Dingli experienced a rapid increase, the amount of persons employed in the agricultural sector did not increase accordingly but recorded a status quo. On the other hand, by 1957 a substantial amount of workers were found engaged in the construction industry, quarrying, and industrial trades typical of the Dockyard. With regards to the latter, one must point out that when taken as a percentage of the locality's population, Dingli had the largest proportion of Dockyard employees among all localities within the northern and western regions. Moreover, when compared to the years preceding the outbreak of the Second World War, a marked increase in the amount of Dingli residents engaged in professional, administrative, and clerical occupations was recorded. As time went by, the strengthening of the non-agricultural element among the Dingli work-force became much more evident. In fact, during the decade following 1957 this sector experienced a rapid decline, inasmuch as the total amount of workers who earned their living from agriculture dropped by 134. Finally, one must remark that the end of the Second World War induced a gradual increase in female employees, to such

an extent that by 1967 the amount of Dingli gainfully occupied females constituted 24.1% of the locality's work-force.

Indeed, following the aftermath of the Second World War ushered a large-scale transformation in the occupational set-up of the Dingli work-force. It seems evident that the heavy reduction in the amount of persons whose livelihood depended solely on agricultural activity occurred principally due to progress in education, the gradual improvement in transport facilities connecting Dingli with other localities, and the availability of new employment opportunities in various sectors. Notwithstanding job diversification, the deeply rooted affection towards the cultivation of fields remained alive among the Dingli natives, inasmuch as several opted to maintain agricultural activity as an additional source of income or just as a hobby. This factor confirms the relevance of the village's motto until this very day: *NON SEGNI QUIES RURIS*, meaning that the serenity which characterise rural ambience does not signify idleness.

Since 1975 the Maltese Islands experienced an opposing migratory flow, in the sense that returned migrants overtook the amount of emigrants. This phenomenon, together with an increase in life expectancy, induced a steady population growth in subsequent years. On the other hand, when compared to the national figures Dingli experienced a higher rate of demographic growth. During the intercensal period 1967-1985 the population of this village increased by 14%, thus recapturing the loss recorded during the decade leading to 1967. At this stage, one must remark that the main factor which

hindered population growth since the late 1950s, the lack of housing facilities, was a problem of the past. The construction of a housing estate in Dingli in the mid-1970s had an immediate effect on population growth within this village. A striking feature involved the considerable amount of individuals aged 0-14 years by 1985, an age group which constituted 26.2% of the total number of residents in Dingli.

Whilst the next decennial census compiled in 1995 recorded a national intercensal increase of 9.5%, on locality bases the population of Dingli experienced a boom amounting to 33%, thus reaching a new peak at 2,725 persons. Such large-scale increase in demographic growth resulted mainly from an extensive expansion of the residential area. This resulted from the building of another housing estate which by that time was fully inhabited, whilst the same applied to a substantial part of a third estate. Contrary to the population residing in the first housing estate, characterised by young couples from Dingli and nearby Rabat, the latter estates were mainly inhabited by immigrants who arrived from various localities within the Maltese Islands. Since these new residential areas were occupied by recently married couples, during these years Dingli experienced an accelerated birth rate which eventually resulted in a considerable excess of births over the number of deaths. Moreover, another factor which induced such demographic growth resulted from a rapid decline in the amount of deaths, reflecting an increase in life expectancy. Finally, one must remark that by the last national census in the year 2005 the population of Dingli exceeded 3,347 persons.

## Education

Evidence clearly indicates that during the entire nineteenth century, this purely isolated and agricultural village was characterised by widespread illiteracy. In 1894, the establishment of a government night school in Dingli, partially addressed the problem of rampant absenteeism from elementary instruction. This school, which continued to operate until 1914, aimed to offer elementary education in the evenings to males who due to their family's low standard of living were constrained to work in the fields during daylight.

The 1921 self-government Constitution marked another milestone in Malta's educational history. Fully aware of inadequate education provision and the urgent need of specially designated schools, successive administrations took the necessary measures to improve the state of education. In 1921, the newly elected Maltese Government manifested such commitment by including within its Cabinet a ministry responsible for public instruction. Notwithstanding economic difficulties, the years leading to the Second World War were marked by the construction of several new schools and the extension of others, a vast programme aimed to meet the needs of elementary, secondary, and technical education. Dingli benefited from such development in school facilities, inasmuch as the government expended £3,384 for the building of an upper storey and an office in the ground floor of the elementary school, a project initiated in July 1928 and completed within four years. Therefore, one can fairly state that the inter-war period ushered the emergence of education in its modern form, involving the instruction of pupils within specially constructed school premises.

Following the *language question*, the shift from Italian to English is clearly visible among the population of Dingli. In fact, whilst the knowledge of these foreign languages stood at parity in 1891, within a span of three decades the number of persons able to speak English outnumbered those with an Italian speaking ability by 109. Moreover, awareness of the Maltese language experienced a gradual increase, to such an extent that by 1921, 13.4% of those Dingli residents whose age exceeded five years were able to write in Maltese. Although the proportion of Dingli school age children receiving formal education stood below that recorded on a national level, it seems evident that substantial progress in education consciousness was recorded during the inter-war period. In fact, besides the gradual increase in the number of students attending the Dingli elementary school, these years ushered a handful of students receiving secondary education, with few of them even furthering their studies in the university, the seminary or other religious institutions.

During the Second World War, the provision of education in the entire archipelago experienced a complete disruption. On locality bases, in order to accommodate more refugees, the British authorities requisitioned the Dingli primary school. In compensation, the literate townsmen who found shelter in Dingli during years of hostilities, instilled in the mentality of the villagers a widespread awareness of the manifold advantages of formal education. This factor, together with the subsequent introduction of compulsory education for all children aged between six and fourteen, resulted in the consolidation of literacy among the young generation. Progress in education never slowed down, to such an extent that by the year 2000, 88.2% of the Dingli residents whose age exceeded ten years were literate. Finally,





one must point out that in view of the gradual increase in the amount of persons who furthered their studies in post-secondary and tertiary

institutions, a growing proportion among the population of Dingli enjoyed a high level of education.

## Criminality

In addition to their responsibility for law enforcement and the maintenance of public order, throughout the years policemen often gave a helping hand in the daily needs of the local inhabitants. This unofficial role was much more felt in remote villages such as Dingli, where for instance until the late 1950s, in view of inadequate telecommunication facilities the police permitted the public to use the station's telephone for private calls. Moreover, until the late 1970s the police station served as a call office, whereas the policemen used to transmit messages received at the station, generally from hospital or other government departments, to any individual. Therefore, it seems evident that the punitive role that the police were occasionally forced to play, was offset by their general helpfulness.

With regards to the general trend of reported crimes committed in Dingli since 1891, a thorough analysis clearly indicates that most commonly these included minor infringement of the law such as

fight, insults and threats, resulting mainly from family disputes. Other common actions which contravened the laws established by the political authority included wilful damage and minor thefts, particularly of agricultural produce or equipment. On the other hand, the most striking feature emerging from such examination involves the very low rate of major crimes committed in this village, such as homicides, attempted murders, major thefts and shootings. In fact, police sources confirm that Dingli stood among those less troublesome localities within the entire archipelago.

*Nota Bene: This is an abridged version of an unpublished work titled 'Studies in Local History after 1800: Dingli' which is deposited at the Melitensia Section, Library, University of Malta. This work contains a full list of references consulted by the author, as well as list of acknowledged mentors and informers.*







## Chapter 2

# Sustainable Development

Marvin Formosa





A sustainable society exists within the self-perpetuating limits of its environment. It is not necessarily a 'no-growth' society but rather a society that recognises the limits of growth and looks for alternative ways of growing. Growth in this sense means the physical, population and economic growth of a society so that sustainable development is a pattern of resource-use that meets human needs while preserving the environment. Sustainable development means adjusting economic growth to remain within bounds set by naturally replenished systems, subject to the scope for human ingenuity and careful husbanding of resources and technological advance, coupled with the redistribution of resources and power that guarantees adequate conditions of liveability for all present and future generations. Sustainable development therefore refers to that progress which meets the needs of the present without compromising the ability of future generations to meet their own needs.

Yet, sustainable development does not focus solely on environmental issues. A United Nations (2005) document refers to the 'interdependent and mutually reinforcing pillars' of sustainable development - namely, economic development, social development, and environmental protection - so that related policies and strategies may cover areas dealing with urban development, social integration and the prevention of social exclusion. Indigenous people have also argued (largely through the various local and international forums such as the United Nations Permanent Forum on Indigenous Issues and Biological Diversity) that there is yet another pillar in sustainable

development policy : cultural. Indeed, *The Universal Declaration on Cultural Diversity* (UNESCO, 2001) states that "cultural diversity is as necessary for humankind as biodiversity is for nature... [which] becomes one of the roots of development understood not simply in terms of economic growth, but also as a means to achieve a more satisfactory intellectual, emotional, moral and spiritual existence". In other words, sustainable development must also ensure that everyone has a fundamental human right to practice the distinctive way of life of their tradition, and to share in the joys of the cultural life of their community.

The world's cultural diversity is a part of the heritage of humanity and is as essential as biodiversity. Progress, according to the mantra of sustainable development, would be any action that moves a person, community, culture, or society toward social/environmental sustainability. For society to progress, decisions made must recognise and respect the requirements and rights of the future generations, as well as the requests and intrinsic value of all species and the Earth's 'carrying capacity' with respect to its human population. By 'carrying capacity' one implies the number of individuals that can live in and use a particular landscape without impairing its ability to function in an ecologically specific way. Sustainability, therefore, is about the notions of *enoughness* and reversibility. Instead of the current tinkering with symptoms of our social/environmental malaise, problems must be solved at their source.

## The 'community' dimension in sustainable development

Nisbet (1967) identified community as a 'unit-idea' which includes, but goes far beyond, religion, work, family and culture by essentially referring to social bonds characterised by emotional cohesion, depth, continuity and fullness. Bell and Newby (1971) put forward a notion of 'community' as involving the following five related characteristics :

- » *Human scale.* As a counter to large, impersonalised and centralised structured, community involves interactions at a scale which can be readily controlled and used by individuals.
- » *Identity/belonging.* The word community incorporates some sense of feeling accepted and valued within a group of people.
- » *Obligators.* Membership of an organisation carried both rights and responsibilities.
- » *Gemeinschaft.* A community will enable people to interact with each other in a greater variety of roles, which will be less differential and contractual.
- » *Culture.* A community provides an opportunity for an antidote to the trend of 'mass culture' by valuing, producing, and expressing the local-based culture.

Williams (1988) made the interesting assertion that the term 'community' is generally used to describe an existing set of relationships. What is most important, according to Williams, is that unlike all other terms of social organisations such as the state, nation, and society, it seems never to be used unfavourably, and never

to be given any negative terms. In the British context, sustainable communities have been more recently defined as

*Places where people want to live or work, now and in the future. They meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life. They are safe and inclusive, well planned, built and run, and offer equality of opportunity and good services for all.* (Communities and Local Government, quoted in Peat, 2000 : 100)

Undoubtedly, communities are central in sustainable strategies because when thinking about the scale at which sustainable development is possible one fundamental answer is the following motto: *think globally, act locally*. Sustainable development must be implemented where people are invested with a sense of place and are able to learn, feel, and be empowered to act. Sustainable development must be integrated into policies and decisions in local communities where people have the power to effect change and make decisions based on a systematic world view, one that brings healing to the environment in the present for the future. Within a local community, people can act as the force driving change in their political system even as they alter their lifestyles. Through their actions, people partake in guiding destiny, despite the fact that a local community is part of a larger more impersonal system. The good news is that local community governments, as opposed to their national counterparts, have a greater degree of understanding of the local problems which may range from land use to political representation to education. They are therefore able to implement and adjust to aspects of sustainability in the social/environmental arena. People define their

local communities and are at the same time defined by them, so that communities play a primary role in maintaining cultural values within and among generations. Whilst the collective of individual values determines community values, the collective of familial values determines what constitute appropriate behaviour and success.

Sustainable development must be flexible and open to community definition because the values promoted must meet various needs and situations in space and time. The process of valuation embodied in sustainable development addresses social/environmental justice in recognising the necessity of equal access to resources as well as equal distribution of goods and services, whilst simultaneously protecting the long-term ecological sustainability of the system that produces them. Sustainable development thrives in local communities because it is there that people make most of their decisions, consuming and waste production, and develop their interpersonal relationships. It is therefore not surprising that lifestyle becomes a political issue.

Citizens at the local level can draw connections between personal consumption and its effects on local, regional, national, and global economic well-being and environmental health. Although political pressure must be exerted continuously on national governments, lifestyles in each and every local community have direct and immediate effects on the biosphere. Local communities, through their collective effects on world society, can surely act as catalysts for change in society at the local, regional, state, and national levels and definitely in the world itself. Through the behaviour of their individuals, local communities contribute greatly to environmental health and the global climate. And because individuals collectively comprise local communities, which in the collective comprise society at the regional, state and national levels, they can heal the global environment simply by changing our individual lifestyles. In a nutshell, communities, as the force that drives change for better or worse, are the appropriate scale for dealing with sustainable development.

## Social and community aspects of sustainable communities

Sustainable development is a holistic approach to improving the quality of life. It postulates that there are intrinsic links among economic, social and environmental well-being. Changes in any one domain will have an impact upon the other. From a social perspective in particular, well-being cannot be sustained without a healthy environment and is equally unlikely in the absence of a vibrant economy. Sustainable communities are described as diverse, reflecting their local circumstances. Although there is no standard template to fit them all, there are key directions that arise from a studied interpretation of the concept. These include (i) balancing and integrating the social, economic and environmental components of communities, (ii) meeting the needs of existing and future generations, and (iii), respecting the needs of other communities in the wider region or internationally to make their own communities sustainable. Such directions lead to the following 'social' processes' (Communities and Local Government [UK], 2006) :

*Inclusive and safe* - fair, tolerant and cohesive with a strong local culture and other shared community activities. Sustainable communities offer:

- » a sense of place and community and cultural identity, and belonging - a place with a positive 'feeling' for people and local distinctiveness,
- » tolerance and engagement with people from different cultures, background and beliefs,
- » friendly, co-operative and helpful behaviour in neighbourhoods,
- » low levels of crime, drugs and antisocial behaviour with visible, effective and community-friendly policing, and
- » social inclusion, equality of opportunity and good life chances for all.

*Well run* - with effective and inclusive participation, representation and leadership. Sustainable communities enjoy

- » representative governance systems which facilitate strategic, visionary leadership and enable inclusive, active and effective participation by individuals and organisations,
- » effective engagement with the community at neighbourhood level, including capacity, building to develop the community's skills, knowledge and confidence,
- » strong, inclusive, community and voluntary sector, and
- » sense of civic values, responsibility and pride.

*Well connected* - with good transport services and communication linking people to jobs, schools, health and other services. Sustainable communities offer

- » transport facilities, including public transport, that help people travel within and between communities and reduce dependence on cars
- » facilities to encourage safe local walking and cycling
- » appropriate level of local parking facilities in line with local plans to manage road traffic
- » widely available and effective telecommunications and Internet access, and
- » good access to regional, national and international communications networks.

*Well served* - with public, private, community and voluntary services that are appropriate to people's needs and accessible to all. Sustainable communities have

- » opportunities for cultural, leisure, community, sport and other activities, including for children and young people,



- » well-performing local schools, further and higher education institutions, and other opportunities for lifelong learning,
- » high quality local health care and social services, integrated with other services,
- » high quality services for families and children (including early years child care), and
- » good range of affordable public, community, voluntary and private services (e.g. retail, fresh food, commercial, utilities, information and advice) which are accessible to all.

*Environmentally sensitive* - providing places for people to live that are considerate of the environment. Sustainable communities

- » provide places for people to live that respect the environment and use resources efficiently,
- » actively seek to minimise climate change, including through energy efficiency and the use of renewables,
- » protect the environment, by minimising pollution on land, in water and in the air,
- » minimise waste and dispose of it in accordance with current good practice,
- » make use of natural resources, encouraging sustainable production and consumption,

- » protect and improve bio-diversity (e.g. wildlife habitats),
- » enable a lifestyle that minimises negative environmental impact and enhances positive impacts (e.g. creating opportunities for walking and cycling, and reducing noise pollution and dependence on cars), and
- » create cleaner, safer and greener neighbourhoods (e.g. by reducing litter and graffiti, and maintaining pleasant public spaces).

*Well designed and built* - featuring quality built and natural environment. Sustainable communities offer

- » user-friendly public and green spaces with facilities for everyone including children and older people,
- » sufficient range, diversity, affordability and accessibility of housing within a balanced housing market,
- » appropriate size, scale, density, design and layout, including mixed-use development, that complement the distinctive local character of the community,
- » high quality, mixed-use, durable, flexible and adaptable buildings, using materials which minimise negative environmental impacts, and
- » accessibility of jobs, key services and facilities by public transport, walking and cycling.

## Bibliography

Mayo, P., Pace, P.J. and Zammit, E. (2008) 'Adult education in small states : The case of Malta', *Compare*, 44 (2) : 229-246.

## References

Bell, C. and Newby, H. (1971) *Community Studies*, Australia : Allen & Unwin.

Communities and Local Government (UK) (2010) *Communities and Neighbourhoods*, available online - accessed on 1/02/10 at <http://www.communities.gov.uk/archived/general-content/communities/whatis/>

Nisbet, R.A. (1967) *The Sociological Tradition*, London : Heinemann.

Peat, K. (2007) 'The ideal of a sustainable community, 2006', in C.J, Madden, M. and Potts. (eds.) *Towards Understanding Community*, pp. 97-110. New York : Palgrave.

UNESCO, (2001) *The Universal Declaration on Cultural Diversity*, available online and accessed on 1/12/09 at <http://unesdoc.unesco.org/images/0012/001271/127160m.pdf>

United Nations, (2005) *2005 World Summit Outcome Document*, available online and acceded on 1/02/10 at <http://www.who.int/hiv/universalaccess2010/worldsummit.pdf>

Williams, R. (1988) *Keywords : A Vocabulary of Culture and Society*. London : Fontana.







## Chapter 3

# Social and Cultural Implications

Marvin Formosa





Despite the presence of post-industrial values, Malta is still characterised by a social fabric that values strong community and family ties. The nation is firmly committed towards the continuous upgrading of its social policies to ensure that whilst the priority needs of its society are met, families and individuals who are at risk-of-poverty and social exclusion are given the necessary support. In their quest to strengthen social cohesion and build a stronger community, all political parties in Malta remain committed to build on the country's social democratic values. All argue that Malta needs to provide personalised services to meet the needs of vulnerable groups by strengthening their access to the labour market, providing more affordable housing, and introducing more family-friendly measures. This commitment ensures that all elected governments offer adequate responses to new challenges and offer adequate social protection. However, Malta cannot fall in the trap of achieving its objectives in social policy in an unsustainable manner. If this occurs, any positive results from progressive social policies will have been cancelled out. It is imperative that social development only uses nature's resources at a rate at which they can be replenished naturally. It was to this end that Malta - together with another 178 Governments - signed Agenda 21 of the *Rio Declaration on Environment and Development* some two decades ago. Malta is a small, open economy, with a very high population density. The character of this country, together with its distinct geographical make-up which introduces an element of regional diversity, accentuates the problems and issues of sustainability. As this case study confirms, Maltese localities can offer a good opportunity for the achievement of a degree of sustainability that contribute towards national and international sustainable development.

A case study was conducted to evaluate of the social sustainability of Dingli. Its objectives were to evaluate Dingli's role in the processes mentioned in the previous section. Definitions of case studies vary but, in essence, all promote the notion that the researcher aims at knowing a single entity or phenomenon - that is, the case - through the collection of data through various procedures. One useful definition is to deem a case study "as an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used" (Yin, 1989 : 23). Due to the nature and demands of the project, the case study opted for a qualitative research design. In qualitative research designs, researchers discuss cases in their social context and develop grounded theories that emphasise tracing the process and sequence of events in specific settings. They seek to explain how people attach meanings to events and learn to see events from multiple perspectives. Qualitative researchers emphasise the importance of social context for understanding the social world and hold that the meaning of a social action or statements depends, in an important way, on the context in which it appears.

The research design of the study contained three key phases. First, evaluating background material on sustainable policy for local communities, and planning the study/report. Second, an empirical phase during which fieldwork was conducted with major stakeholders in the Dingli community. Stakeholders constitute people who will be affected by any endeavour and who can also influence it. Dingli includes five key stakeholders - namely :

- » *Dingli local council* [DLC]. Local councils form the most basic form of local government in Malta and there are no intermediate levels.

The DLC includes five members from two different political parties, the Nationalist and Labour parties.

- » *Dingli residents*. The people who live in Dingli and who may be further sub-grouped in the following sectors : children, youths, adults, older persons, disabled, men and women, and those residing at the village core versus other more rural dwellers.
- » *Business operators*. Dingli holds various business companies including groceries, greengrocers, village bars/pubs, stationeries, beauty salons, pet shops, hairdresser saloons, butchers, and haberdasheries.
- » *Farming community*. Dingli has an above average of total land declared by farmers and total agricultural land area. Dingli includes an above average of residents who work as full- and part-time farmers whose views must be heard<sup>1</sup>.
- » *Non-governmental organisations*. NGOs are key players in any community. Dingli is no exception and whilst most residents are members in one or more, the voices and opinions of local NGOs are given special attention by the local governance.

The interviews followed a semi-structured mode, with interviewees selected through purpose sampling. In semi-structured interviews, a list of questions is kept in mind but the interviewee is given ample leeway as to the direction of the interview. Interviewees are considered to be active participants whose insights, feelings, and cooperation are essential parts of a discussion process that reveals subjective meanings. Semi-structured interviews, indeed, involve a mutual sharing of experiences. However, the interviewer's role is also paramount. Although he/she does not approach the interview session in an authoritarian mode, authority is still upheld : the interviewer's presence and form of involvement - how she or he listens, attends, encourages, interrupts, digresses, initiate topics, and terminates responses - is integral to semi-structured interviewing. In semi-structured interviews the questions and the order in which they are asked are tailored to specific people and situations, the interviewer shows interest in responses and encourages elaboration, the interviewer and interviewee jointly control the pace and direction of the interview, and the interviewer adjusts to the interviewee's norms and language usage. Purposive sampling gets all possible cases that fit particular criteria using all possible methods. It uses the judgement of the social scientist in selecting cases or it selects cases with a special purpose in mind. Purposes sampling was ideal for this study because (a) it needed unique interviewees that are especially informative, (b) it required to select members of a difficult-to-reach specialised sub-population such as farmers and representatives of non-governmental organisations, and (c), it needed to identify particular types of interviewees for in-depth investigation. The third and final stage of the methodology was a phase where the data arising from the field work were analysed and evaluated, and a report written up.

1 The 2001 Census of Agriculture (NSO, 2003) reported that Dingli has a total of 36 full-time farmers and breeders, all male except one, in the following ages 35-44 (11 males), 45-54 (29 males and one female), 55-64 (3 males), and 65+ (one male). The total number of part-time farmers and breeders stands at 314, 265 males and 49 females, in these age brackets : 29 males and 5 females under the age of 35 years, 35-44 years (51 males, 15 females), 45-54 years (101 males, 12 females), 55-64 years (36 males, 6 females), and 65+ (48 males, 11 females).

**Table 1.1: Dingli's total population by census years**

1901	1921	1931	1948	1957	1967	1985	1995	2005
807	1087	1,258	1869	2041	1795	2047	2725	3347

Source : NSO, (2007a) *Census of Population, 2005, Volume 1 : Population*, Malta : National Statistical Office.

**Table 1.2: Dingli's total population by sex, Census years 1995 and 2005**

1995			2005			Change 1995-2005		
Total	Males	Females	Total	Males	Females	Total	Males	Females
2725	1370	1355	3347	1706	1641	622	336	286

Source : NSO, (2007a) *Census of Population, 2005, Volume 1 : Population*, Malta : National Statistical Office.

**Table 1.3: Dingli's total population by age and sex (2005)**

Age	Total	Male	Females	Age	Total	Male	Females
0-9	427	216	211	60-69	202	107	95
10-19	532	277	255	70-79	142	58	84
20-29	463	245	218	80-89	55	27	28
30-39	522	257	265	90-99	5	3	2
40-49	506	254	252	99+	1	1	0
50-59	492	261	231	Total	3347	1706	1641
0-19	959	493	466	20-59	1983	1017	966
60+	405	196	209				

Source : NSO, (2007a) *Census of Population, 2005, Volume 1 : Population*, Malta : National Statistical Office.

## Dingli : A social portrait

The 2005 National Census reports that Dingli's population increased substantially during the past century, from 907 in 1901 to 3347 in 2005 (table 1) - (NSO, 2007a). In the period 1995-2005, its population increased by 622, 336 males and 286 females (table 2). This meant that whilst the population density per kilometre in 1995 was 478, in 2005 this figure reached 591.

Dingli's population is relative middle-aged as the largest number of residents (532) is found in the 10-19 age bracket, followed by the 30-39 (522 residents) and 40-49 (506 residents) age brackets (table 4). In 2005, the mean age of the whole population was 34.9 (34.7 males and 35.1 females). However, as much as 26 percent (897 residents) are above the age of 50 (the dependency ratio in 2005 was 41.0), so that the coming two decades will witness a steep rise in the percentage of the ageing population especially if number of younger families from other villages and cities settling in Dingli continues to decline. The 2005 Census also reports that the number of residents holding Maltese and

non-Maltese citizenships is 3321 (1706 males and 1641 females) and 26 (11 males and 15 females) respectively.

In 1995, Dingli included 896 dwellings, 812 occupied and 84 unoccupied (NSO, 2007b). Ten years later, these figures reached 1198, 1033 occupied and 165 unoccupied. Occupied dwellings constituted terraced houses (557), semi-detached houses (55), fully-detached houses (29), ground-floors (143), flats/penthouses (18), maisonettes (200), farmhouses (29), suite of rooms forming part of a household unit (1), and other (1). These dwellings were owned freehold (787), with ground rent (155), rented unfurnished (48), rented furnished (6), held by emphyteusis (9), and used-free-of charge (28). Of the total number of occupied dwellings, the number of rooms by the number of persons is presented in table 4.

**Table 1.4: Occupied dwellings in Dingli by number of rooms and persons (2005)**

Persons	Total	Number of rooms							
		1	2	3	4	5	6	7	8
Total		1	8	37	106	285	286	168	80
1	101	1	7	17	26	18	21	7	-
2	202	-	1	11	32	73	58	17	5
3	266	-	-	3	30	78	63	44	30
4	326	-	-	3	10	89	107	70	23
5	106	-	-	2	6	22	28	24	16
6	24	-	-	1	1	3	9	4	4
7	6	-	-	-	-	2	-	2	1
8	2	-	-	-	1	-	-	-	1
9	-	-	-	-	-	-	-	-	-
10+	-	-	-	-	-	-	-	-	-

Persons	Total	Number of rooms							
		9	10	11	12	13	14	15	16+
Total		30	18	6	5	1	1	-	1
1	101	-	-	1	3	1	1	-	-
2	202	2	1	-	-	-	-	-	1
3	266	8	7	-	2	-	1	-	-
4	326	14	7	3	-	1	-	-	-
5	106	5	2	1	-	-	-	-	-
6	24	-	1	1	-	-	-	-	-
7	6	1	-	-	-	-	-	-	-
8	2	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-
10+	-	-	-	-	-	-	-	-	-

Source : NSO, (2007b) Census of Population, 2005, Volume 2 : Dwellings, Malta : National Statistical Office.

The 2005 Educational Statistics (NSO, 2007c) reported that Dingli has one primary school which includes 17 classes containing 142 boys and 142 girls (total 284). This school houses a head, two assistant heads, five facilitators, 16 primary teachers, 5 kindergarten assistants, one supply teacher, two part-time kindergarten assistants, and one part-time instructor. In the period Sept 2004 - March 2005 Dingli's primary school held a total of 268 pupils of an age that by law were expected to attend school. There were a total of 1259 absences, 1011 authorised and 268 unauthorised. Dingli also includes a secondary school that includes 10 classes and a total of 258 boys. This school houses one principal, one assistant head, 20 secondary teachers, one primary teacher, and five facilitators. As far as older adult learners are

concerned, during the 2005/2006 academic year the University of the Third Age had only one member from Dingli, a female in the 65-69 age bracket (NSO, 2006).

A recent study commissioned by the DLC (Azzopardi Cauchi et al., 2010) shed further light on the Dingli community. The majority of residents were found to be married and four member families. As far as their educational status was concerned, it was found that 22 and 34 percent held primary and secondary educational attainment levels respectively, with another 12 percent having attended tertiary

education. Educational attainment figures included trade schools (eight percent), the Maltese Centre for Arts, Science and Technology (six percent), Opportunity Centre (one percent), Sixth Form (six percent), Higher Secondary (four percent), whilst some eight percent did not attend any school or, at least, no further than primary schooling. Eight percent of the local population is illiterate. The majority (90 and 87 percent) attended their primary and secondary schooling (respectively) in public institutions. However, some 18 percent studied abroad. The study reported that about 66 percent hold a secondary school leaving certificate, 20 and 12 percent hold passes at Ordinary and Advanced levels respectively, and some ten percent to hold tertiary qualifications. One in three residents visits a library, as well as attending educational courses organised in the locality. Another one in three residents do not own a computer at home, and of those who do, another third do not have internet access. Some 49 percent claimed that they are able to save money, with some 70 percent not satisfied with their saving patterns. Two out of every three families own a credit card, with most families earning in the region of €20,000 annually. Whilst 75 percent were satisfied of their financial status and deemed it to be on the same level as the average Dingli resident, some eight percent claimed to be unsatisfied and thought their income to be 'worse' than others. When asked whether they owned a second home 84 percent replied in the negative, 54 percent went for a holiday abroad in the last three years, and as much as 84 percent own a mobile phone.

Social cohesiveness was another point of investigation. Some 90 percent meet with their children more than once a week, grandparents and grandchildren meet at least once a week, neighbours encounter each other about once a week, and 91 percent meeting friends once a week or more. When asked to whom they turn to in case of emotional difficulties 28 percent claimed to contact their children, 25 percent mentioned their friends, and 20 percent mentioned their parents. The majority of residents, 80 percent, are not involved in volunteering activities, 55 percent claimed to never take part in cultural activities, and 70 percent never took part in sports. Whilst 78 percent claimed that they experience no noise pollution in their everyday lives, 18 percent asserted otherwise. The majority, some 62 percent, reported that Dingli had a problem of vehicle over-speeding. Although official statistics report a relatively low crime rate, residents claimed to be preoccupied about the high incidence of vandalism and thefts from vehicles. It was also reported that 70 percent have some kind of private medical insurance, and 80 and 70 percent respectively claimed not to drink alcohol or engage in smoking. However, results also reported that some 16 percent may have some problems concerning alcohol dependence. Respondents claimed that they feel relatively safe walking around Dingli after sunset. Only 41 percent felt their homes were secure when they went out, with 24 percent believing that the probability for their house to be burgled in their absence was high. Many ask neighbours to keep an eye on their residence when they are out or even hire security personnel. In fact, only 35 percent were confident that the police force was doing its job, with as much as 62 percent not having a high opinion of the role of the police force in preventing crime in Dingli. The majority of residents do not own guns (70 percent), with the remaining declaring the possession of hunting guns.

A Social Security Benefits study conducted by the National Statistics Office (NSO, 2009) found that in the 2000-2008 period, Dingli experienced a substantial decrease in the receipts of a Children's Allowance, from 473 in 2000, to 379 in 2004, to 224 in 2008. The Children's Allowance is payable to locally residing citizens of Malta who have the care of children under 16 years of age and where the household income does not exceed a stipulated amount. In the case of those families where the household annual income is €23,923 or less, the eligibility to Children's Allowance is calculated on the difference between the declared income of the family for the previous year and the established threshold of €23,923. Families who care for children under 16 years of age and whose household annual income exceeds €23,923 are entitled to a Fixed Children's Allowance of €250 per child per annum. Dingli included a total of 218 recipients for this allowance. As regards the retired population, Dingli experienced a slight increase in the 2000-2008 period of the number of persons in receipt of a Retirement Pension, from 50 in 2000, to 60 in 2004, and to 63 in 2008. The Retirement Pension is payable on reaching pension age (61 in the case of males and 60 for females), with the rates and types of categories vary according to a range of statutory conditions depending on the rate of the service pension. A higher increase was recorded with respect of pensioners in receipt of a two-thirds pension, from 91 in 2000, to 112 in 2004, and to 168 in 2008. The two-Thirds Pension is a pension related to earnings payable to persons who have retired after January 1979. This scheme provides for a pension equivalent to two-thirds of the insured person's pensionable income. The numbers of recipients of the National Minimum's Widow's Pension - payable to widows, irrespective of age, who are not gainfully occupied, or who are occupied but earning less than the national minimum wage and in receipt of a service pension - fluctuated from 33 in 2000, to 36 in 2004, and to 28 in 2008. The number of recipients of Survivors' Pension (an earnings-related pension payable to a widow/er whose husband/wife was entitled to a two-thirds pension at the time of his/her death) was as follows : 14 in 2000, 21 in 2004, and 19 in 2008. Eighteen residents were in receipt of Unemployment Benefits in 2008, down from 29 and 19 in 2004 and 2000 respectively. On the other hand, unemployment assistance was awarded to 25 recipients in 2000. Whilst Unemployment Benefit is payable to unemployed persons for a short-term period of 156 days, unemployment is a more long-term arrangement. Recipients of the National Minimum Invalidity Pensions - payable to persons deemed permanently incapable for full-time or regular part-time employment but are recipients of a service pension - also registered an increase, from 21 in 2000, to 42 in 2004, to 49 in 2008. The number of recipients of the Social Assistance for Single Unmarried Parents - given to a single parent, who does not earn more than a certain amount of income (his/her total income earned together with the Social Assistance entitlement for 2 persons should not exceed the National Minimum wage) - increased from 2 in 2000, to 7 in 2004, and 8 in 2008 (all females). The Supplementary Assistance, a top-up income given to low-income families against means testing, was also included in this study. Following national trends, Dingli held a decline of beneficiaries in the 2000-2008 period : 172 in 2000, 145 in 2004 and 130 in 2008.

## The Dingli Local Council



The DLC includes five councillors. Self-government can be defined as the right and ability of local authorities, within the limits of the law, to regulate and manage a substantial share of public affairs under their own responsibility and in the interests of the local population. Local councils are based on the principles of subsidiarity and autonomy, in the interest of administrative efficiency as they take many roles previously under the responsibility of central government. The DLC is vested with several functions, including (i) the upkeep and maintenance of roads and pavements, (ii) collection of waste and road cleaning, (iii) seeing to the availability and maintenance of public conveniences, providing rubbish bins and skips were needed, and their proper use and maintenance, (iv) the upkeep and maintenance of public gardens, public libraries, playgrounds and sports or cultural centres, (v) providing adequate road signs, road markings, pedestrian crossings, sidewalks and parking areas, (vi) propose any changes in traffic schemes and safeguarding the well-being of children in the vicinity of schools, (vii) recommend to the competent authority in relation to planning or building schemes, and (viii), assisting citizens by providing information relating to consumer affairs, transport, tax, and social services.

To date, various projects and activities of a socio-economic or environmental nature have been promoted or undertaken by the DLC. These included the building and upgrading of *Ġnien il-Familja* and *Ġnien il-Ħaddiem* respectively, organising adult exchanges with peers from foreign countries, providing premises, donations, and a range of assistance to local non-governmental organisations, and donating books to Dingli Primary School. The DLC also takes part in visiting the sick and older persons during in the Christmas festive season, as well as providing various services such as completion of tax and V.A.T. forms, passport applications, free internet service, and flu shots to older persons. One must also not fail to mention its role in the organisation of Carnival activities, life skills sessions for teenagers and young adults, Christmas carols, children Christmas parties, pilates sessions, the care of housebound older persons and those suffering from dementia reading sessions for children, and various cultural outings during Christmas, Easter week, and summer. The DLC also committed itself to the building a new library at the primary school, implementing a pedestrian zone in Dingli's inner zone, putting together an interpretative centre at Dingli Cliffs which would serve as socio-cultural-historical information centre about the community, and the opening of shelters to the general public during *Jum Ħad-Dingli* which occurs annually. Recently, the DLC has also come up with the idea of organising *Agrofest* that would celebrate the culture, history, and traditions of the community. An extensive socio-criminal study commissioned by the DLC has also just been published.

The DLC also conducts important infrastructure building and maintenance works. It constructs traffic junctions in areas with traffic problems so that traffic flow is improved, puts up and maintains curbs for the easy and safe walking of residents, upholds and preserves roads in a good state, as well as attending to acts of vandalism.

## Sense of place, inclusive and safe

### Sense of place

Dingli boasts an extraordinary sense of place. Its peripheral and *cul-de-sac* geographical position means that whilst residents spend most of their time within the locality, few visitors actually find themselves in the village. The village's most visited spot, the Dingli Cliffs, is relatively far from the village core, and hence, even on Sundays the village remains tranquil. Residents claimed that the village presents them with a high sense of positive feeling and local distinctiveness :

*Is-sabih ta' Ħad-Dingli hu li hafna trabbew hawn. Nafu lil xulxin sewwa hawnhekk, u barra minn hekk, inħossuna biċċa wahda ma' xulxin...Jien inħossni li nirraguna u nahsibha mhux, kif ħa naqbad ngħidek, mhux kif irrid, imma kif jahsbuha d-Dinglin...Meta kont nahdem ir-Rabat kont nara differenza kbira bejna u huma.*

Dingli has resisted the sprawling effects of urbanisation and so that it can be easily defined as a community in locality - that is, as a geographical expression that denotes a human settlement located

within a fixed and bounded local territory. Residents attributed a close link between geographical location and social life, which signifies their embodiment in a set of social relationships which take place wholly, or mostly, within the locality of Dingli :

*Ħad-Dingli daqsxejn maqtugh... Mort skola hawn għalkemm sekondarja le, ħdimt xi ftit hawn ukoll qabel ma kellu t-tfal, u anki r-raġel minn hawn ukoll. Issib tixtri kollox minn hawn, forsi jekk tkun trid xi ġlekk ikollok tmur sar-Rabat jew il-Belt, imma l-bqija moqđijn tajjeb. Ahna hawn noħorġu, kemm fis-sajf u kemm fix-xitwa.*

Living in Dingli is imbued as a type of relationship - more specifically, as a sense of shared identity. Interviewees highlighted how living in Dingli provides them with a community 'feeling' or 'spirit' of the community, a sense of shared identity. They perceived and defined residents living in the community as *bil-għaqal* (thrifty) and *bieżlin* (hardworking), and always ready to help their fellow community members :

*Ahna unique! (laughter) In-nies hawnhekk mhux halja, jaqalghu lira, jonfqu nofsha u jgemma ghlu l-bqija. U nghid jien, ghalfejn ghandek toqghod tonfoq f'hafna mbarazz... Ahna nahdmu hafna. Hafna jorqdu kmieni ghax hafna ghandhom xi ghalqa, daqsxejn patata, anki hass, dejjem tiffranka u fl-istess hin thossok tajieb. L-arja taghmillek tajieb.*

Of course, people were aware that times were changing and that coming generations or residents who come from outside Dingli were not as firmly attached to such values or followed such norms as they. However, it remains that whilst such exceptional families were in the minority, the public exposure of Dingli was still planned and carried out by families who lived in Dingli for more than one generation.

## Social inclusion

Social relationships in Dingli are intimate, enduring, and based upon a clear understanding of each individual's position in society. Personalised relationships are paramount, so that an individual's status was estimated according to who that person was rather than what that person can do. The culture of Dingli is relatively homogenous, enforced by well-recognised moral custodians, particularly the Church and the family. Kinship, indeed, seems to be one of the fundamental blocks of Dingli so that a 'community of blood' coincided with a 'community of place' to produce high levels of emotional cohesion, a greater depth of sentiment, and therefore, a more meaningful way of life :

*Jien minn hawn u anki tal-mara. Fir-rahhal ghandna hafna ahwa u kugini. F'hafna tigijiet tiltaqa' mar-razza u r-radika! Fih vantaġġ dan ghalieq meta jkollok b'zonn l-ghajnuna ssibha! Meta tigi l-karozza bil-hsara jew il-mara jkollha b'zonn xi haġa, malajr jigi xi hadd. Però, vera, fl-istess hin ma tista' taghmel xejn, ma jistax ikollok sigrieti hawn.*

Indeed, everyday life in Dingli is highly characterised by forms of 'managed intimacy' and 'totality'. Population density engenders high levels of social visibility which fosters 'managed intimacy'. Whilst in larger social systems knowledge of each other is unavailable, in a limited terrain such knowledge is quickly acquired and rapidly altered into public consumption. This produces an atmosphere of familiarity as individuals are unable to take refuge in anonymity and due to an interdependent social network where each person figures many times over. Social visibility leads to a kind of 'totality' - that is, the resulting combination of critical mass and indivisibility constraints on one hand, and of social compactness, visibility and interconnectedness on the other. Life is therefore embodied with a dense psycho-social atmosphere where governments and the community are highly pervasive to the extent that it is virtually impossible to become socially invisible.

This is not, of course, the same as saying that Dingli was totally devoid of any large-scale, impersonal, calculative and contractual relationships, or that the situation is not changing. In the past three decades Dingli has gone through a process of de-urbanisation - namely, a steady influx of residents from both neighbouring and afar towns and cities - as part of the 'flight from cities' experience throughout the whole country. This occurred because the development of public transport and increasing car ownership meant that people did not have to live next door to their workplace. The implementation of large-scale housing schemes in Dingli was also a determining factor. Residents are aware that the younger generations and new

families do not feel as connected to Dingli as those who were born and raised in Dingli, especially now that males as young as eighteen years are old enough to own (second-hand) cars which makes it easier for them to frequent the recreational areas of Malta (especially Paceville), and are quick to label the village as 'backward' and 'boring'. In fact, a distinction was continuously made between those who were raised in Dingli and others who came to live here from other villages/cities :

*Had-Dingli villaġġ b'żewġ ucuħ. Fuq naħa waħda ghandek il-parti l-antika fejn in-nies huma l-parti l-kbira minn hawn, kulhadd jaf lil xulxin, u hafna ilhom jafu lil xulxin minn meta kienu żgħar, trabbew flimkien. In-naħa l-oħra, tista' tgħid ta' wara l-grawnd, joqogħdu nies li ġew minn barra. Dawn, il-biċċa kbira ma jimpurtahom minn xejn li għandu x'jaqsam ma' Had-Dingli, anki għall-festa jmorru ġurnata l-baħar.*



One downside to high levels of community solidarity is the tendency of inhabitants who come from other villages and cities to be excluded from taking part in the planning and running of activities taking place. Many residents who were not born or raised in Dingli remarked that they found the community too tightly-knit to make any social inroads. Residents who came from Rabat recounted how the Dingli community perceived them suspiciously and rarely let their guard down. These residents pointed out that there exists a Rabat-Dingli antipathy and competition in everyday life, that precluded them from integrating themselves in the community in a meaningful manner. It was also claimed that most community members already had their own circle of friends and kin relations, so that it was difficult to make any new close acquaintances in the community. This experience was especially difficult for full-time home-makers who settled in Dingli from other cities/villages:

*Mhux faċli tintegra hawn. Immur nixtri, nara hafna nies u nsellmilhom u huma qishom isellmuli u ma jsellmulix. Ma nafx. Però mbagħad tarahom jtkellmu ma' haddiehor, u jien ikolli seba' mitt sena biex inħallas u nitlaq... Naf, ikunu jafuhom hafna iżjed minni, jien mhux minn hawn, u kulma ili noqghod hawn tmien snin.*

However, it is interesting that even inhabitants who were born and raised in Dingli experienced social exclusion, emphasising how some families held a monopoly in the planning and carrying out any social activities taking place:

*Jien li jdejjaqni hu li fir-rahhal huma dejjem l-istess nies li jigu mgħajta biex jghinu. Anki l-kappillan, hemm xi żewġ*



*familji, u minn mindu kont żghira, dejjem huma, dejjem huma. Għaliex? Ma nistax nifhem! Kollox f'idejhom. Jien, kieku jtuni ċans, inkun nista' ngħin fil-komunità imma qatt ma kelli ċans.*

At the same time, one must not fail to mention that when non-governmental organisations reached out to invite people from the Dingli community to take part in running such organisations', this invitation was not taken upon. As the representative of the Dingli Swallows Club recounted,

*Dan huwa klabb ġo villaġġ żghir u għalhekk dejjem għandna bżonn il-voluntiera. Ahna limitati. Konna ktibna ittra lil kull min joqgħod fir-raħal, fejn fehmu l-pożizzjoni tagħna, u fejn invitajna lin-nies tar-raħal biex jgħinuna. Jistgħu jidhlu membri jew anki fil-kumitat. Minn daqs tant nies, wiehed biss kellimna. (Dingli Swallows Club representative)*

One notes that finding limited opportunities to integrate oneself in traditional non-governmental organisations - such as the local football and band club - newcomers to the village tend to find more opportunities in relatively 'modern' associations such as the Girl Guides and Scouts :

*Ahna għandna response li nħossu huwa tajjeb hafna għar-raħal żghir bħal Ħad-Dingli. Il-ġenituri lesti li jikkollaboraw magħna, u anki meta norganizzaw fundraising activities, ir-risposta tkun waħda li ttik kurraġġ...Għandna response tajjeb mir-raħal kollu. Ħafna ġenituri jgħibu t-fal hawn. (Scouts leader)*

*Il-ġenituri jgħinu hafna, fejn jistgħu ovvjament, imma meta jkollna l-laqqgħat, speċjalment il-ġenituri tal-girl guides iż-żgħar, dawn jattendu u jaħdmu id f'id magħna... Għandna bniet mir-raħal kollu. Il-ġenituri jgħidulna li jħossuhom*

## Well run

### Local governance

For almost all the people interviewed, Dingli is governed by a highly effective and efficient DLC whose elected members are ever ready to put the needs of the community as their priority. As various interviewees emphasised,

*Ahna għandna kunsill buli (sic), jaħdmu kollha kemm huma, speċjalment is-Sindku...Il-kunsill jgħinek, tmur hemm thossok smat u li għandhom hin għalik...Jien kelli tappiera tagħmel l-istorbju, tant li kont qed inbati biex norqod, mort filgħodu, wara nofsinħar kienu diġà bagħtu lil xi hadd jirrangaha...Jekk għandna xi haġa tajba hawn hu li l-kunsilliera ma jimxux bil-kulur politiku. Jaħdmu għar-raħal, u int min int, x'kulur int, jaraw kif ha jgħinuk... (Various interviewees)*

This is excellent news for the community as in other localities the squabbles between local councillors from different political parties have been well-documented in the local media as well as academic

*komdi jibagħtu t-fal tagħhom hawn u japprezzaw ix-xogħol tagħna fil-komunità. (Girl Guides representative(s))*

### Safety

Dingli is perceived as being characterised by low levels of crime, drugs and antisocial behaviour. Interviewees feel safe to walk about most parts of the village, even at night, and the only problem is the presence of stray dogs on the outskirts of the village. Two major issues that makes residents feel anxious and perturbed consisted in the over-speeding of cars - especially in Ġuze Ellul Mercer and St. Mary streets - and the lack of policing in the locality. In their own words,

*Issa mhux hażin. Imma kien hawn żmien fejn it-triqat, ngħidilhom jien id-dritti, kienu jużawhom biex itellqu l-karozzi. Però anki filgħodu meta n-nies ikunu mghaġġlin għax-xogħol jafsulha l-karozza. U anki filgħaxija, speċjalment is-Sibt, meta ż-żgħażaġh johoroġu. Jekk nibqgħu sejr in hekk ikollna xi diżgrazzja. Jaqbadni l-bard naħseb.*

For residents, policing in Dingli is far from being visible, effective and community-friendly. The police station is closed most of the times, and when it is open, there are frequently no police personnel stationed. There are no police personnel on the beat, and many suspect that when over-speeding occurs and motorcyclists drive without helmets, police tend to 'close an eye' or 'look the other way' so that no arrests or fines are ever issued :

*L-Għassa dejjem magħluqa, jew fuq l-antiporta però ma jkun hemm hadd. Darba mort nirraporta habta, għax kont hbatt, però ma kien hemm hadd. Qbadna u rranġajna bejnietna imma ma għandux ikun hekk. Għall-inqas ikollna l-hinijiet meta tiftaħ, mhux ma nafu xejn, u jekk tkun miftuħa tkun miftuħa, u jekk tkun magħluqa tkun magħluqa.*

studies. Special praise was awarded to the Dingli's Mayor whom the community sees offering strategic and visionary leadership. Residents recounted how despite being elected on the Labour Party ticket, the Mayor did not differentiate between Nationalist and Labour Party sympathisers, consulted with all the stakeholders in the community, and had no doubt that he put the welfare of Dingli above Labour Party interests. This emerged clear when all the councillors rallied behind the mayor when he objected the possibility of a factory being turned as a Fireworks Depot in Dingli Cliffs. Of course, it would be naive to think that the DLC operates completely devoid of problems and political manoeuvres but it remains that, relatively to other local councils, it runs smoothly and has a strong positive relationship with most of the residents.

One key issue in the local governance concerned the NIMBY ('Not In My Own Backyard') attitude and mentality of many residents in the community. Although, as already highlighted, residents feel a sense of identity and place in the community, and are quick to emphasise their strong commitment to the improvement of Dingli, the sacredness of their dwelling was second to none. The NIMBY attitude was evident

when interviewees tended to prioritise their personal interests over communal ones. Many residents attended DLC meetings only when they had personal interest on an item on the agenda, and were not ready to jeopardise the economic value of their dwelling. For instance, despite their concern on car over-speeding, residents did not want to have traffic humps in front of their houses. Similarly, bus stops and skips - or public washrooms for that matter - were not wanted either in front or in the vicinity of their houses :

*Mhux sewwa ghax il-Pulizija ma taghmilx xogholha rridu nbatu ahna. Ghalfejn ghandu jkolli sleeping policeman quddiemi, biex il-karozza tal-linja toqghod tieqaf, taghmel l-istorbju u tifgana bl-exhaust. Kulhadd jaf min huma li jgerru...Bus stop tfottihielek dar. Nies wara l-bieb, storbju, u fix-xemx jstkennu fuq l-ghatba, ma tistax toħrog jew thalli l-bieb imbexxaq, jew anki taħsel l-ghatba. Ghal grazzja t'Alla qiegħda daqsxejn 'il bogħod...(Various interviewees)*

This tension between what's good for the community and personal interests was present throughout many interviews, and contradicted many an interviewee's opinions. This was especially evident when residents stated the need for more public spaces for children but then were unhappy that they lived in the vicinity of public gardens, or when they praised the work of the various non-governmental organisations in the locality but then resisted that these organisations are given meeting premises in the vicinity of their households.

### Civic values, responsibility and pride



Dingli residents were, by and large, extremely proud of their village, and strove for a responsible local government that safeguarded the various cultural and historical spots in the locality. Many took part in organising and/or attended *Jum Ħad-Dingli*. They were highly pleased that their locality included unique aspects to the Maltese Islands such as the Dingli Cliffs, *Ta' Baldu*, *is-Simblija*, and *l-Għar il-Kbir* - even if to-date the latter three do not fall within Dingli territory (*Ta' Baldu* and *is-Simblija* lie within the confines of Rabat, and *l-Għar il-Kbir* are situated within Siġġiewi - the DLC is currently planning action so as to bring these three sites under its jurisdiction). Many voiced their apprehension that some unique features of Dingli were being left to their own devices with the consequence that were breaking down, or that the DLC was not doing enough to educate the residents on the cultural and historical character of the community :

*Inhoss li l-affarijiet li għandna ma niehdux hsiebhom sew, tant li qed jispicċaw. Kieku haddimna mohħna, għandna biex naghmlu mużew mill-aqwa, imma mur sibhom l-affarijiet issa. Kollox tmermer...Nghiđu, pereżempju, l-Għajn, għaliex din ma taħdimx? Meta kont zgħir niftakarha taħdem u kienet għaxxa. Haġ' ohra! In-nies jafu biha? Jafu bl-Għajn tal-Ħasselin? Jekk ma niehdux hsieb dawn il-postijiet, u nuruhom lit-tfal tagħna, ha nispiċċaw bhala rahal...(Various interviewees)*

Many voiced their concern that the community, and to a certain extent, the DLC and Church authorities in particular, are not doing their utmost in establishing Dingli as prime heritage site on the par of other Maltese cities and villages. Here, one must underline that despite such assertions the DLC is working very hard to bring various heritage sites in Dingli under its control. Through the Mayor's hard work, the DLC has just acquired the *Għajn tal-Ħasselin* and there is a pending MEPA application for its restoration, and there are also plans to restore *l-Għajn* in Triq il-Buskett. Accessing *Ta' Baldu* and *l-Għar il-Kbir* is proving to be more problematic due to the fact that these are found in private lands, with the latter also being situated outside the geographic area under the jurisdiction of DLC.

### Voluntary sector

Volunteering is the practice of people working on behalf of others or a particular cause without payment for their time and services. Volunteering is generally considered an altruistic activity, intended to promote good or improve human quality of life, but people also volunteer for their own skill development, to meet others, to make contacts for possible employment, to have fun, and a variety of other reasons that could be considered self-serving. The voluntary sector in Dingli is alive and kicking, with an extremely high number of non-governmental organisations per capita, especially when you consider that some only target children. Field research uncovered the following organisations :

**Dingli Swallows Football Club:** As in other localities, football is the most popular sport in the community. The Dingli Swallows Football Club, founded in 1948, offers an opportunity for children, teenagers and young adults (males only to-date) to practice this sport under professional guidance as way to relieve stress caused by the educational system and the negative effects of peer pressure. The Club currently plays in the Premier Division which is considered to be a great success considering the smallness of the village, and consequently, the lack of financial and human resources. The club is very popular in the community and the number of boys training with the club number as follows : under 7 (17 children), under 9 (17 children), under 11 (15 children), under 13 (20 children), under 15 (25 children), and under 17 (25 children).

**External Feast Committee:** This committee is responsible for the activities that take place outside the Church and in the community during the annual village feast. It is therefore responsible for the fireworks, band marches, street decorations, and logistical arrangements with the Police and DLC. The committee has eighteen members with the following roles : President, Vice-President, Secretary, Assistant Secretary, Treasurer, Assistant Treasurer, and Public Relations Officer. The rest are members.

**St. Mary Band Club:** This club promotes the teaching of musical band instruments as well as the stimulation of a developed sense

of appreciation of the art of music. At the same time, it acts as a social centre where the members participate in cultural, educational, and social activities in a relaxed and familiar atmosphere. The club includes 43 musicians that were all the products of the Ġużè M. Spiteri School of Music which is part of the same club. Although the majority of musicians are from Dingli there are some from outside the village (from Imtarfa, Ħal Tarxien, Bahrija and Rabat). The school is directed by four qualified teachers of music (three male and a female). The band consists of the following musicians : Flute (2), Eb Clarinet (2), Bb Clarinet (13), Bb Trumpet (5), Saxophone Soprano (2), Saxophone Alto (5), Saxophone Tenor (1), Althorn (3), Euphonium (4), Trombone (2), Bass (1), and Percussion (3). The club also has a choir of eight persons, all female and above the age of 25. At the moment this school has about five students learning an instrument.



**Ghaqda Talent Dingli:** This association provides an opportunity for Dingli residents, of various ages and all levels of skills and experience, to take part in amateur dramatics productions. It stages a variety of performances throughout the year working alongside other non-governmental organisations and the Parish Church. This association includes approximately 80 members whose ages varies from 3 to 65 years.

**Girl Guides Association:** This association caters, in a holistic way, for the needs of girls and young women in Dingli. The association claims that being a member of the Girl Guides Association is exciting and a great way for girls to make friends while discovering their potential by having fun and being active. The Malta Girl Guides Association was founded in 1923 and are full members of the World Association of Girl Guides and Girl Scouts (W.A.G.G.S). As a Girls-Only organization, this association believes that such an environment gives the best opportunities for girls and young women to develop personally and socially. The association provides girls and young women, a non-formal educational programme where girls and young women develop leadership and life skills through self-development, challenge and adventure. Girl Guides learn by doing through their 8-point programme and following their commitment of the Promise & Laws - namely, health, mind and spirit, local and international guiding, creativity, skills, environment, culture and heritage, and service. This association includes a total of 56 members, broken down as follows : guiders (7), unite helpers (1), young leaders (2), Rangers (5), Guides (15), Brownies (20) and Dolphins (6).

**Labour Party Dingli Office:** This office serves as a local branch for the Labour Party. It provides members and other Dingli residents with the

opportunity to take part in social and leisure activities, and in political events that are in line with the ideology and interests of the Labour Party in Malta.

**Christian Doctrine Society (M.U.S.E.U.M.):** The main priority of this organisation is catechetical work. The centre is open for the catechetical formation of children and youths and occasionally adults as well. Additional activities are organised for the children to include recreational and related activities. The male branch has a total of 133 members : *sen*a 1 (18), *sen*a 2 (14), *sen*a 3 (26), *sen*a 4 (17), *sen*a 5 (15), *sen*a 6 (31), *Magħżulin* (8), *Aspiranti* (3), and *Kandidati* (1).



**Nationalist Party Dingli Office:** This office serves as a local branch for the Maltese Nationalist Party. It provides members and other Dingli residents with the opportunity to take part in social and leisure activities, and in political events that are in line with the ideology and interests of the Nationalist Party in Malta.

**Salesian Oratory:** The Salesian oratory provides an opportunity for children and teenagers to become more educated and a place to play in a secure and adult-supervised environment. The Salesian Oratory also provides the young residents of Dingli with an opportunity to gain skills for life as well as a place for Catholic Worship. In short, the Salesian Oratory is a place where young members of the community can experience love and respect from people outside their immediate family, always within a Catholic environment. The number of members fluctuates and in early 2009 the Oratory had as much as about 160 members (circa), but at the time of writing this report the number went down to 60.

**Dingli Scouts:** The Dingli Scout Group offers activities that compliments schooling and family outings, fulfilling needs met by neither. The activities carried out by the Dingli Scout Group helps children to develop self-knowledge the need to explore and to discover. For those children who seek achievement this organization offers a number of Challenge Awards and Activity badges which help them to bring out their talents, keep them fit in mind and encouraging them to depend on their own abilities. The number of scouts are as follows : Beavers (16 boys, 9 girls), Cubs (16 boys, 6 girls), Scouts (12 boys 15 girls), Ventures (6 boys), and Rovers (4 boys, 1 girl).



Interviews highlighted the extreme dedication the persons involved in running such organisations. They put in a considerable number of hours of work, meeting fellow organisers and client group many

times a week, some almost everyday, spending significant amount of personal financial resources on fuel telephone calls, and with their private lives revolving substantially around the needs and operations of their respective organisations. The relatively high number of non-governmental organisations implies that residents in Dingli have no problem in identifying and participating in leisure and cultural avenues that interests them. Indeed, many families are members in more than one non-governmental organisation, some even in various, and this reflects well on both the voluntary services and participation in the community. One expected that the combination of longer working hours, the increasing number of mothers in paid employment, rising participation of private lessons and more (sometimes bordering on the excessive) cyberspace activity on behalf of teenagers and adults alike, would result in a steep decline in participation rates in non-governmental organisations. Yet, this has occurred in Dingli only to a limited extent. Of course, the running and planning of non-government organisations - like in other localities - is not without its share of difficulties and problems. This issue will be discussed in more detail in a further section.

## Well connected

### Public transport

The public transport service to Dingli has experienced substantial improvements in recent decades. Whilst in the past commuters were made to embark in Rabat and wait for another bus to take them on forward to their destination, nowadays buses leave the Dingli terminus frequently and all the way to Valletta. Moreover, there are direct transport services to Junior College, the University of Malta, and Mater Dei Hospital. Whilst in the past a trip to Valletta was unfeasible unless you could spare some two hours for transportation, trips have become shorter so that many are willing to go shopping in Rabat, Valletta, and Sliema by public transport :

*Ghalkemm mhux daqshekk faċli li taqbad tal-linja u tigri biha, qeghdin hafna ahjar minn qabel. Sar-Rabat tasal malajr, u anki sal-Belt illum mhux xi haġa kbira biex tmur b'tal-linja. Ifhimni, ma tistax tkun mgħaġġel ghax trid tistenna fuq l-istage u għandek kważi erbghin minuta biex tasal il-Belt, imma jekk taħseb kmieni, worth it!*

Reluctant users of public transport include employees who work on shift, and others who have more than one stop on their itinerary such as parents who, in addition to their work destination, have to drop their children at grandparents, schools and child-care centres. Whilst multi-stop journeys are - at the time of writing this report - unfeasible by public transport, those living in the Buskett area find it impossible to come to Dingli by public transport since the return leg of the trip does not go through Buskett. Families living in rural residences - sometimes some five to ten minutes away by car from the village centre - are, unfortunately, completely cut off from the public transport route, as are older persons (especially those above the age of 75) whose functional limitations mean that climbing up and down the steep bus steps is not an easy practice :

*Impossibbli nuża tal-linja. Irrid inwassel it-tfal għand ommi Ħal-Qormi, immur ix-xogħol, imbagħad nerġa'*

*nghaddi għalihom, u għieli jkolli nieqaf nixtri mill-grocer... It-trasport bla sens għalija. Niġi mill-Buskett imma mbagħad ma nistax immur lura. Nista' nimxi imma jien inkun għamilt xirja. Ikolli niġi hawn ma xi hadd bil-karozza ghax jien ma nsuqx... Ahna minsijin hawn. Ili nhambaq biex forsi naraw kif karozza tal-linja, imqar darbtejn kuljum, darba filghodu u filghaxija, tghaddi minn fejn noqogħdu ahna. Vera li qeghdin ftit hawn ahna, u xi ftit imwarrbin, imma xorta ċittadini bħal haddiehor... L-anzjani ma tantx jistgħu jużawha tal-linja. L-istaffa għolja wisq! Darba rajt lil wahda titla' l-istaffa fuq irkoptejha. Niżlu jghinuha imma ngħiduha kif inhi, kedda kbira... (Various interviewees)*

As children get older and get to attend the primary school in Dingli, or other schools which offer them transport, parents' use of private vehicle is reduced. However, it is equally true that as children get older they get increasingly attracted to leisure services and cultural activities, not to mention private lessons, that are only available outside the community. It is hoped that following the current reform underway in the public transport system the situation of residents in Dingli continue to improve.

### Parking, walking, and cycling facilities

The relatively small number of residents in Dingli means that there are no widespread parking problems. Many own their personal garage, and if not, can find parking very close to their residence. There are no major matches played in the football ground, and the few that are scheduled, are usually non-league or junior matches which generate limited traffic. Parking is also possible when attending Sunday Mass and even when shopping in the inner zone areas. Moreover, tourist arrivals on Sundays and other public holidays do not really affect the village as these head towards Dingli Cliffs which are some way out of the village and where there are adequate parking facilities. The only exception is in the early morning, during the morning rush hour when most residents are leaving for work and/or taking children to

school, and when it is common to see double parking even despite the presence of traffic wardens.

The lack of heavy traffic makes walking and cycling around the village and its outskirts an enjoyable activity. The only problem, and a major one for sure, is that pavements are being constructed with ramps so as to accommodate the many garages found in Dingli's streets. This is very inconvenient to local residents, especially those who drive pushchairs, older persons, persons with disability, and others with functional limitations. Moreover, residents voiced their frustration at the obstacles they face :

*Hawn bankini tajbin, bhal ta' [Trijq] Claudette Agius, però hawn oħrajn daqsxejn perikoluži li jaqbillek iżjed timxi fit-triq. Ġieli tiltaqa' ma' granpuni fil-hajt biex iżommu t-twieqi miftuħa li jekk tolqothom ma' moħħok iħalluk hemm tal-post. Dawn in-nies għandhom jindunaw bil-periklu ta' dawn il-granpuni. Hemm ukoll djar li għandhom targa fuq il-bankina. Din ukoll hija perikoluża.*

It is certain that more education is needed as how the community can keep pavements easily accessible to everyone.

## Communication networks

Dingli residents are well connected to communication networks. Interviewees were all aware of the central role that communication

technology is leading in contemporary lives. Business operators could not remain competitive unless they owned a mobile phone, were connected to the internet, and were ready to invest in the latest equipment. For instance, all pubs and bars own a cable license to display foreign football matches on one, or in some cases even two, television sets. Families, especially those with children and teenagers, were all connected to the internet for both educational and leisure purposes. Older persons, traditionally thought not to be at the forefront of the cyberspace revolution, are also becoming increasingly computer and internet literate - although to be fair this was more prevalent amongst older males than their female counterparts :

*Domt ma kelli kuraġġ nixtri kompjuter, għax ħsibt li m'inx kapaċi imma t-tifel għamilli ħafna kuraġġ u għeni nixtri kompjuter mingħand ħabib tiegħu u f'radda ta' salib kelli wiehed. Għall-bidu kienet diffiċli u t-tifel kien ġej u sejjer jgħini fil-problemi li ltqajt magħhom imma issa sejjer tajjeb ħafna. Nikteb ittri, nikkopja diski u films għall-użu personali tiegħi, u anki għandi mailing list għall-kartolini tal-Milied.*

Moreover, everybody tends to own a mobile phone so that most families now own some three to five telephone lines when one takes in consideration the landline at home. Indeed, the public and private lives of interviewees were both becoming increasingly based on novel communication networks which indicate both increasing affluence and consumerism.

## Well served

### Activities

Dingli is a very active locality and offers various opportunities for cultural, leisure, community, and sport activities, both for its younger and older residents. Indeed, many of the residents believe that considering Dingli's relatively small population, it includes too many organisations. The range and nature of non-governmental organisations in Dingli have been outlined in a previous section. Herein, it is opportune to mention some of the difficulties and problems surrounding the presence of a relatively high number of organisations in a small locality :

- » First, one notices a strong competition for participants, as will always be the case when the supply of opportunities for activities and the pool of possible participants are high and restricted respectively. There is nothing essentially strong with a strong drive by non-governmental organisations to attract more members. Problems, however, arise when particular associations decide to open their membership boundaries and target a particular sector of society which is the only source of membership of another association.
- » Secondly, one also notices an unsociable pattern in determining the dates for fundraising activities where the strongest associations tend to show less respect to smaller organisations which may have set scheduled their activities well in advance. Many organisations showed clear disappointment that not everybody declared their activities in the DLC's Diary to the extent that this procedure was abandoned. It was impossible for the author, as well as not

being the scope of this report, to determine which organisations were more reluctant to collaborate but it was clear that a lack of partnership was rife amongst the community's associations.

- » And finally, as a direct result of the first two situational problems, it was clear that there existed a strong animosity between certain associations. Again, which organisations show strong dislike to each other is not the scope of this report, and the author believes that this information is very well known in the Dingli residents. It suffices to say that many organisations informed me that the ethos of the voluntary services in Dingli is 'min hu l-aqwa jħawwell' which can be easily translated to the English saying of 'might is right'. Without doubt this situation is a serious threat to the sustainable development of Dingli.



## Lifelong learning

The locality has two schools within its locality, one primary (Ġuze Ebejer Primary School run by the government) and another secondary (Savio College, run by the Salesians). It was only the former which came up as a topic during the interviews since it is the school which caters for most of the sons and daughters of Dingli residents. The secondary school, so far, caters for students who take part in a nationwide exam for boys aged ten years. Residents whose sons and daughters attended the primary school were very pleased with its levels of instruction. Far from being a non-consequential school in a peripheral village, residents emphasised the high quality of teachers present in this school, and the professional and rigorous way in which the administration and coordinators carry on their work. Many interviewees were past pupils of this school so that they were in a position to note the improvements that occurred throughout these past two decades or so. In their opinion, the primary school is far from simply a place where pupils are simply taught the basic academic subjects but represents an avenue where holistic learning takes place successfully. As parents emphasised, pupils may borrow books from the library, engage in sports and other physical activities, given an opportunity to study subjects in the humanities such as social studies, history and geography, as well as other topics including ICT, science, personal and social development, music and drama. In one parents' own words,

*L-iskola tajba hafna. L-ghalliema u s-surmast jaraw il-bżonnijiet ta' kull student minn lenti wiesgħa. Jghallmu sew ghax jghaddu hom hafna għal Junior Lyceum u għall-iskejjel tal-knisja. Hemm hafna dixxiplina wkoll li hi haġa tajba hafna... Joħorġu hom hafna drabi matul is-sena, li permezz tagħhom jieħdu hafna tagħrif Prattiku u utli.*



The DLC also represents a hub of social and learning activity, and coordinates classes in literacy (Maltese and English), life skills for teenagers and adults, information and communication technology, aerobics, *filigranu*, electricity (basic course), self-defence, and modern dance. It also coordinates cultural-educational activities such as the Francis Ebejer appreciation evening some years back and various cultural outings. Moreover, many associations in the locality provide free or subsidised learning opportunities. For instance, the Scouts Association and St. Mary Band Club provide members with music classes, the Girl Guides Association instruct girls in the basic personal and social skills needed in modern times, and the MUSEUM branches work hard to instil in children and adults a strong Catholic formation. The Day Care centre (more on this service below in the coming section) offers many educational services to older persons -

as well as on some occasions to the community at large - ranging from health prevention courses to cultural awareness programmes.

## Social services

Dingli residents have a lot of social services to fall upon. This report has already emphasised the sterling work conducted by the DLC. Moreover, the locality boasts of a highly efficient and organised day centre open to older persons aged 60 and above, and persons with special needs irrespective of their age. It currently has approximately 65 members. The DLC provides transport for Day Centre members who have mobility problems or who live relatively far away. The day centre succeeds in preventing social isolation and the feeling of loneliness, and in reducing the social interaction difficulties which older persons tend to encounter. It also aims to motivate members by encouraging them to participate in the planning of day centre activities by enabling older persons and persons with special needs to remain as independent and socially integrated as possible whilst at the same time providing respite for their relatives and carers. The main activities that are organised in the day centre include the service of physiotherapy sessions, occupational therapy, podologist, creative, social, physical, educational activities and dancing lessons. These activities are complemented by educational talks on topics of particular relevance to older adults. Guest speakers are invited to deliver lectures about health issues, home safety, and welfare services in addition to outdoor activities which are also organised monthly. The Dingli day centre also promotes intergenerational activities by inviting younger adults and children to share experiences with older adults.

The sub-post office also drew positive comments. Many, especially residents who have family abroad and are older, are frequent users of the postal system, and pointed out that the opening hours of this service were adequate, and even complimented by a good and efficient service. Despite the relative smallness of the Dingli community, which as a consequence can only generate a small number of private services, residents claim that they are well served. Dingli includes the services of groceries, greengroceries and butchers - which provide all the everyday needs of an average household at very competitive prices - although the purchasing of fresh fish remains somewhat problematic :

*Illum sirt kważi tinqeda minn kollox hawn. Ikel, laħam, posta, ħaxix, insomma, issib kważi kollox. Anki minn jaħdem il-madum u l-ġebel hawn. Jien rari nixtri affarijiet barra minn hawn...*

The presence of stationeries, ironmongers, take-away outlets, DVD renting retailer, hairdressing salon, and haberdasheries also makes the lives of residents easier.

Interviews met three main grievances as far as social services are concerned. One complaint constituted the absence of a bank, with the nearest one being at Rabat. This was a problem especially for older people and others who do not drive :

*Din li m'hawnx bank kbira! Mela l-gvern ma jafx li rridu nsarrfu ċ-ċekk u niġbdu l-flus is-sena kollha... Qabel meta kellna l-bank tagħna konna aħjar. Stajt immur meta ridt u mhux noqgħod ngħid lil binti biex teħodni magħha... Hawn anzjani li kellhom jibdeu iħallu kollox f'idejn uliedhom minħabba li ma hawnx bank. Mhux sewwa! Il-gvern għandu jsib soluzzjoni...(Various, Day Care Centre members)*

Although many understand that it does not make economic sense for a bank to open a branch in Dingli - due to the fact that the local population is small and that not many residents are interested in investing money but rather to simply cash their cheques, a type of transaction from which the bank will not make very limited profit - it remains that availability of banking services is an essential component of sustainable communities. Although Dingli does have an ATM machine, older persons are reluctant to use it. This could be changed by a programme of financial literacy at the Day Care Centre sponsored by the bank whose ATM is positioned in Dingli. It is also hoped that in the coming future, the government will enter in discussion with the major banks with the possibility of subsidising a local branch for social justice reasons.

Another grievance was related to the social and personal needs of persons with disability. It was not the scope of this report to be a full-scale analysis of the needs of persons with disability living in Dingli, so that the data and ideas presented here were the result of meeting with a very limited number of persons with disability. It is clear from the interviews that Dingli is not very convenient for persons with disabilities as the locality presents them with a number of street furniture, and especially in summer, feast decorations<sup>2</sup>. Persons with mobility impairment find it difficult, sometimes to get on or down from pavements, especially if cars park next to the ramps. Signs need to be put up near ramps so that cars do not obstruct them. Another problem is that barriers have been built at openings at Ġnien il-Familja in order to safeguard children from crossing the roads haphazardly. Whilst the aim is commendable what the community failed to see is that these openings were the only parts where ramps were constructed - and hence - the only points of accessibility for wheelchair bound persons. It is unfortunate to note that some pavements have building stones (knaten) which preclude persons with mobility disabilities, especially those that are wheel chair, from accessing the other side of the pavement. It is also unfortunate to note that shops are not accessible, even those which have set up recently, to the surprise of local persons with disability. In Dingli, persons with disability are in a great need for official social assistance from both central and local government sources. However, it is unfortunate to note that most of the social services run by the DLC are for able-bodied persons, and that at no instance are persons with disabilities offered empowerment courses that would lead them to improve their self-confidence, mobility training, independent living skills, and know-how in assistive apparatus. Moreover, it is certainly a good idea for the community at large to receive education - even of an information leaflet type - of the etiquette with persons with disability such as meeting a blind person, and consequently, how to enter and leave the room, dining together, and guiding him/her around. While the Dingli community has a 'heart of gold' and residents go out of their way to help persons with disability - even to the point of taking them out in their car every given Sunday - much more structures for social services are needed. The DLC must ensure that persons with disability have a smooth access as possible to physical environment, information and services whilst at the same time combating the problems of social isolation and social exclusion.

<sup>2</sup> 'Street furniture' means any object, movable or immovable, which is the Council's property or is under its responsibility, and which although would not substantially form part of the road, pavement, garden or other public area, would be placed in such area or fixed to it, or even placed on it, and includes dustbins, benches, poles, planters, boundary walls, walls, columns, roundabouts, central strips and traffic islands.

It is the opinion of the author that the absence of a ramp in most of the shops in Dingli, even new ones, does render the community inclusive.

The final main complaint, especially by young families, is that the locality offers no facilities for child care when in other localities government-run nurseries provide a service to children as young as eighteen months. Although young mothers working with either the government or public-private companies are provided with adequate maternal and parental leave, others who work with private companies do not enjoy such benefits. If they have no members from the external families (usually the maternal grandmother) who are willing to take care of their young children, at least until they enter kindergarten, they have no other option but to exit from the workforce.

## Health-care services

Residents were generally disappointed with the local health services provided at the *Berġa* in Ġuże Ellul Mercer Street since it was claimed that this office had decreased its services in recent years. It was also maintained that for many years the government had stopped maintaining the *Berġa* to the extent that it was in a general state of disrepair and shabbiness - until the DLC stepped in and conducted the needed refurbishment works even though this was the responsibility of the central government. In the early 2000s, Dingli residents could use this office as a place for emergency treatment when they felt unwell, as well as a place where their blood pressure and samples are taken. Nowadays, it was emphasised, one could only get treatment through an appointment even if one experiences sudden ill-health :

*Vera li hemm il-berġa, u naf li taqdi hafna nies, imma żgur li jixirqilna aħjar. Għandna bżonn li nkunu nafu izjed fuq is-servizzi li nistgħu nircievu. Jien ili noqgħod hawn għaxar snin u qatt ma rċevejt fuljett fuq kif nista' nuża dan il-post. Anki jekk din tkun magħluqa filgħaxija, għandu jkun hemm notice board mimlija informazzjoni...Jien għandi t-tfal żgħar, jekk jaqbadhom xi haġa wara nofsinhar jew fil-weekend, fejn ha mmur? Forsi 'l quddiem ikun hawn xi care centre ġo Ħad-Dingli, forsi hdejn il-Kunsill...*

The absence of medical and paramedical services (especially nursing and podiatry care) is a problem for many residents, especially older females who do not drive, who find that in the occurrence of ill-health they have no other alternative than to go to the Rabat Health Centre or visiting the offices of two private medical practitioners which are stationed close to the village centre. Residents informed me that house visits by private medical practitioners were generally avoided and practiced only as a last resort as they were considered as relatively expensive. Of course, such life patterns are largely true only to specific categories of Dingli residents - such as older and vulnerable families who are the risk-of-poverty - and should not be generalised to the whole of the Dingli community. In fact, there are many families in Dingli - especially the self-employed and professionals - who can afford to call private medical practitioners and even specialists such as paediatricians for house visits.

## Environmentally sensitive

Communities need to take responsibility for the protection and rehabilitation of the physical environment. The environment is a critical component of community, and needs to be incorporated in any integrated approach to sustainable development. This applies both to the natural environment and to the built environment. Environmental issues are important in bringing a community together, as well as serving as a catalyst for community action.

### Green services

The DLC provides services that aid residents respect the environment and use resources efficiently. It provides public conveniences next to its premises in the centre of Dingli. The DLC offers the service of door-to-door collection of household waste as domestic waste is collected everyday including public holidays, and a bulky refuse twice a week. Both services are offered free of charge. Skips for metal, plastics, paper, and glass are present in more than one locality. The DLC provides for the service a street cleaning service for the cleaning of public roads and public gardens. Residents felt very well-served by these services and professed to use them frequently :

*Rigward l-iskart ma hawn xi tgerger. Kuljum jiġi jiġbor, anki l-Ħdud u l-festi. Qabel ma konniex naghtu kas, imma issa grazzi għall-Gvern u anki l-Kunsill sirna iżjed konxji tal-ambjent u meta jiġbru l-borża l-griza hafna djar johorġu wahda...Domt ftit biex drajt imma l-Kunsill bagħat fuljett jispjega x'għandek tarmi u x'għandek titfa' fil-borża l-griza għar-riċiklaġġ. Billi jiġu jiġbru kuljum ma għandekx il-problema li l-iskart ha jakkumula f'darek...Għandna wkoll il-bring-in-sites. Jien nużahom meta nkun nahdem bix-xift u għalhekk ma nkunx nista' noħroġ l-iskart fis-sitta ta' filgħaxija. Fir-rahall qegħdin fejn il-grawnd, post ċentrali hafna, faċli tilhaqhom minn kullimkien...(Various interviewees)*

Moreover, as stated in official regulations the following activities need a DLC's permit : placing a skip in public property, placing of kiddie ride machine in public property, deposit of building material in public property, deposit and use of crane and machinery, placing of tables and chairs in public property for catering services, placing of kiosk, trenching works, and entertainment.

## Well designed and built

### Public and green spaces

One of the main strengths of Dingli is the presence of user-friendly public and green spaces. Dingli boasts two public gardens, *Ġnien il-Ħaddiem* (which also includes a five-a-side synthetic football pitch) and *Ġnien il-Familja*. The latter, due to its more central location, has become very popular in the summer where children can be seen playing till late in the evenings. At the same time, Dingli's geographical position makes it ideal for countryside walks. Many residents claimed how living in Dingli makes it possible to enjoy weekends without leaving the village, by going for long walks and hikes near Dingli Cliffs or other neighbouring places.

### Appropriate design and layout

Dingli is of an appropriate size and has an adequate level of density. Its design consists of three concentric zones : an inner business district with the shops, civic buildings, and commercial enterprises, a second outer zone consisting of the older residential area, and a third outer zone of suburban terraced houses and maisonettes. More specifically, the second outer zone includes Housing Estate 1 & 2 which was built in the 1970s and early 1980s, and whose majority of residents were born and grew up in Dingli. The third outer zone included Housing Estate 3 where the majority of residents are from cities/villages outside Dingli. However, all places are within walking distances, and the inner zone includes all the important shops such as stationeries, haberdasheries, unisex hairdressing saloons, DVD rental, groceries and greengroceries, and ironmongers. The Church is also found in the centre of the village. The majority of older people reside in the inner zone, and hence, have no problem in gaining access to these outlets or to religious functions. However, if one looks at the demographic composition of residents it follows that in about two decades or so a significant number of adult residents in the third zone will be in their later years. This calls for much preparation on behalf

of local governance, a process which may be termed as senior-smart planning.

### Housing market

One key issue in sustainable development is related to whether communities offer sufficient suitable land and buildings to support the community. Unfortunately, young engaged couples wishing to set up a family in Dingli are finding it very difficult to purchase suitable housing at affordable prices and rental opportunities are almost non-existent. Young females engaged to boyfriends from Dingli or from other cities/villages are generally very keen to take up residence in Dingli. Apart from holding an emotional affinity with the locality, they prefer to set up a family in close proximity to their family of origin for child-care related reasons. However, this is becoming more difficult to accomplish. Suitable land for housing has been almost fully-developed in Dingli and local couples must compete with an increasing number of couples and young families who want to steer away from central and harbour cities due to their high levels of various types of pollution. Indeed, the search for suitable housing in Dingli has emerged as a fundamental source of anxiety for locally engaged couples :

*Ahna domna hafna biex sibna post hawn Ħad-Dingli. Il-flats li bdejna naraw kienu żgħar u għoljin hafna [fil-prezz], u għalhekk iddeċidejna li naraw bnadi ohra. Konna vera mdejnin għax anki r-Rabat kienu għoljin mhux hażin. Kien żmien vera diffiċli u ta' dwejjajq, tant li kien ikollok aptit thassar tant kemm ma tarax futur. Però mbagħad konna fortunati għax sid ta' flat li konna rajna għall-bejgħ ċemplilna u qalilna li lest jinżel fil-prezz. Ġebbed minn hawn u ġebbed minn hemm xtrajnieh. Imsallbin qegħdin. Insomma, taħdem trid biex taqta' kemm tista' u timlieh biżżejjed biex tkun tista' tidhol tgħix fih.*



Many parents, in fact, feel obliged to help their children in this quest by either lending them money without interest, or - if they live in a terraced house - demolish their dwelling and build some two to three new units for themselves and their children :

*S'issa t-tifla mhijjex gharusa imma qalet lil ommha li meta tizzewweg hawn trid tibqa'. Issa naraw ghax mhux b'xejn tixtri hawn! Jiena lest nghinha kif nista', xi haga mgemma' ghandi imma ma nahsibx li hu bizzejjed illum. Izjed nahseb inwaqqa' hawn u ntella' xi tliet flats, wiehed ghalija, iehor ghaluha, u mbigh l-iehor. Ghat-tfal taghmel kollox.*

Engaged couples who fail to find affordable housing in Dingli seek other possible housing options at neighbouring cities and villages, especially Rabat and Mtarfa, although some are even constrained to venture to more distant villages/cities.

## Buildings and negative environmental impacts

The relationship between the housing market and negative environmental impacts is a thorny and problematic issue in the Dingli community. As was well documented in the Ministry of Finance, the Economy and Investment's (2009) *Pre-Budget 2009 Document*, the inconvenience and concern to neighbours, caused by the construction industry, has increased substantially since the year 2000. Up to some years ago there were still sizeable tracts of land, within development boundaries, that remained untouched by development. The development activity that took place in these areas had little or no effect on established urban areas. As the amount of land that was available for development diminished, developers turned to vacant

plots within the established areas and to the redevelopment of existing properties. Hence, the increased impact of construction activity on the quality of people's lives has become more real. As is expected, this is generating much displeasure and discontentment amongst the local community since the resulting buildings jar with the visual imagery of conjoining houses and the traditional visual characteristics that typify Dingli's inner zone, as well as due the increasing pollution as the result of cutting stone :

*Din li twaqqa' u tibni fottietu r-rahhal. Barra mit-trabijiet u t-trakkijiet ghaddejjin ha jgibuh ma jintgharafx. Hawn din it-triq fejn noqghod [Guzè Ellul Mercer] digà mhassra, bil-bini gdid li ma jaqbel xejn mal-ohrajn fuq kull naha. Illum qed nimxi rasi 'l isfel, l-anqas irrid inhares lejn x'nhu jigri.*

*Vera morna l-bahar. It-trabijiet ghidli lili. Tnaddaf kull siegha triq u kullhadd ghandu l-asthma illum. X'ma jkollokx asthma bit-trabijiet li qed jaqilghu...Mhux talli jwaqqghu s-sabih imma talli l-bini li jittla' jibqa' shell sakemm jinbiegh u Alla jaf meta se jinbieghu kollha daqs kemm hawn flats ghall-bejgh.*

There is no easy solution to this dilemma. One cannot stop legal development and even residents who are personally against such expansion admit that in the future even they might convert their housing premises to their economic and personal advantage. It is still to be seen whether a solution to such dilemmas can be found either by the central of local governments, a resolution which is surely very difficult to come by.

## Policy discussion

### Sustainable 'social' development for communities

For social sustainability to be a real possibility in Dingli, it requires a healthy degree of intra- and inter-generational equity - that is, the recognition and acceptance of differences, and equality in access to opportunities between social groups and generations. Local policy must aim at reducing dismantling social inequalities with regard to the most disadvantaged groups, notably women, children and young, the old-old, and people with disabilities. Although there is considerable variety in the activities that constitute social interventions in sustainable development, they can be categorised into the following three groups : service development, the community centre, and social animation.

#### Service development

Much sustainable development activity is essentially social service development, involving the identification of social needs, and the provision of structures and services to meet them. Only so can Dingli develop but without putting the needs and aspirations of its residents at risk. The process of service development by the local authorities should involve the following steps :

- » The identification of a concern, either among service providers or in the community at large, e.g. a lack of recreational facilities for

youth, lack of emergency shelter for women in crisis, inadequate housing, loneliness among the aged, increase in vandalism, etc.

- » A detailed or systematic study of the need or problem to determine its nature and extent, through, for example, discussions with service providers, a needs survey, looking at what happens in other places, examination of relevant statistics, etc.
- » A public meeting, forum or consultation, with all the people in the community encouraged to attend or participate. The body must then decide on some course of action, e.g. establishing a committee to examine the matter further, referring the matter to an existing organisation, or establishing a new community-based agency, such as women's refuge, youth centre, etc.
- » If such a new body is to be established, the necessary formalities need to be completed, such as the drawing of a constitution, legal incorporation, possible registration as a co-operative, etc. These essentially determine the structure of the new organisation : who will be its members, how its 'office bearers' will be elected, and so on.
- » The development and on-going operation of the new body, including encouraging people to become actively involved, seeking funding (whether from government, the private sector, the membership,

the local community, or through fundraising projects), possibly employing staff, and so on. And finally,

- » An on-going monitoring and evaluation of the new body and its services, including ensuring that it remains accountable to the local community and/or its constituency.

Each of these steps is itself a complex process. Moreover, social service development does not always follow the stages outlined above, and whilst they are not unique to the development of sustainable development in local communities, they occur to some degree in other forms of community and national development projects.

### The community centre

A good sustainable strategy is the presence of a community centre which must be perceived as symbolising all that is good in Dingli. It is also important that the community centre is owned by all the different members of the community - that is, people of all ages and abilities, all non-governmental organisations, and the local government too. Indeed, a major forerunner of this approach to sustainable development is the university settlement movement in the late nineteenth Century in Britain, where settlement houses were established in low income areas and supported a variety of programmes using the energy and skills of socially committed undergraduates. They served a dual purpose of not only providing social programmes for disadvantaged people, but also providing valuable experience for students who were to go on to occupy positions of leadership in the society. The community centre, then, is far from a new concept, and has always been an important component of community development. The simple idea of providing a central meeting place, with some degree of resources (staff, volunteers, funds, equipment, etc.) is still an essential ingredient of much community development work. Such a location can be used for a variety of activities - recreational, educational, political, cultural, health, advocacy - and can become the focal point of for the other kinds of community development activities.

The idea of a community centre - a relaxed informal setting serving as the focal point of neighbourhood activity - has been a more recent manifestation of local neighbourhoods, at an even more localised level. A neighbourhood house in Dingli can be used as a basis for child care, education, skills development, information and referral, group discussions, and so on. The initiative for developing a community centre or neighbourhood house can come from a number of quarters, including local government, state government, non-governmental agencies, churches, and local communities groups. Experience has shown that it is so critical for the local community to be fully involved in the planning. A community centre imposed from the above, by a well-intentioned national or local government or non-government agency but without genuine community involvement, will more than likely be located in the wrong place, have an inappropriate physical design, and not meet the most important felt needs of the neighbourhood and community. In the interests of cost-cutting, or of 'trying to do something useful with the old church hall' for example, decisions can easily be made without adequate involvement, which render the resulting community centre virtually useless.

### Social animation

The difficult, and sometimes disagreement, relationships enjoyed by the various non-governmental organisations in Dingli indicate strongly that sustainable development must also focus on the actual

quality of social interaction within a community, rather than directly on the provision for human services. Therefore, a social development programme might simply seek to facilitate people in the community talking to each other and interacting more in their everyday lives. Such community development is less-goal directed, at least in the initial stages, through specific service goals may subsequently develop out of that interaction. It is important that somebody from the locality takes the role of a community worker, simply trying to bring people closer together in a stronger experience of community interaction, is adopting such a role. There are many examples of such work, where what begins as simply an experience of community living can end up providing a focal point for a wide variety of human interaction, with significant political, economic, and social consequences of the quality of community life. Hence, the role of this person is more one of catalyst, simply aiming to bring people together and to help them unlock their potential for an experience of community and for action. Community work concentrates on process rather than outcome, on the assumption that if the process is sound and (and based on inclusive, non-violent and affirming principles), outcomes will be achieved based on the genuine needs and aspirations of the people concerned. Consciousness-raising activities, dialogic relationships and critically reflective practice are, without doubt, particularly important in sustainable development.

### Sustainable 'cultural' development for communities

#### Preserving and valuing local culture

The lack of knowledge on the community's historical and social roots, as generally manifested by a large segment of the Dingli community, is a real impediment to sustainable development. This is because local cultural traditions are an important part of a sense of community, and help to provide a community with a sense of identity. It is therefore imperative for sustainable development measures to identify the important elements of the local culture, and to preserve them. These might include local history and heritage, locally based crafts, local foods or other products, and in some cases, even dialects and languages. Communities may also have particular traditions, such as local festivals or fairs, a town band, a reputation for skill in particular activities, links with a particular ethnic community, and so on.

However, external influences can effectively break down these local cultural traditions, and it often requires a deliberate community strategy if they are to be retained. As with other aspects of community development, there can be no simple recipe of how this can be achieved. The initiative must come from the community itself, and the way in which this will be done will vary from community to community, according to local conditions, culture, and economics. The community needs to identify what are the unique or significant components of its cultural heritage, and to determine which of these are worth preserving. Then a plan can be enacted as to how this might be accomplished, through, for example, activities at the local school or at the community centre, festivals, publications, making a video, etc. The most effective plan will be one which involves many members of the community, rather than just a small group or an elite force, and one which integrates the cultural traditions within the mainstream life of the community, rather than setting it apart.

Care must be taken that this form of cultural development does not create an artificial 'museum' approach to local culture, which sets the traditional culture aside from the day-to-day reality and maintains it

in a static rather than a dynamic form. For sustainable development to be effective within a wider community development context, it must not be separated in this way, but must be seen as a real part of the community. If this is achieved, the local cultural tradition can become a focal point for social interaction, community involvement and broad-based participation, and can become an important process in other aspects of sustainable development, such as economic and environmental development. At the same time, it is important to be aware that not all cultural traditions are worth preserving. For example, one would not wish to encourage a community with a tradition of racism, domestic violence, hooliganism, or alcoholism to perpetuate these with pride and to protect them on the grounds that they are important local traditions giving people a sense of identity.

While cultural diversity is important, a cultural developmental strategy must also be informed by social justice principles. This asserts the importance and universality of fundamental issues of human rights, and the importance of class, gender, and race/ethnicity, which in effect circumscribe the freedom of relatively autonomous and decentralised forms of unsustainable development. Such issues should be central to sustainable development and must not be lost in the false interests of cultural relativism and diversity. They are essential in determining which aspects of a traditional community culture should be strengthened and preserved as part of the community developmental process.

## Sustainable 'political' development for communities

The need to provide Dingli residents with higher levels of social empowerment means that the distribution of power within a community must be more equitably shared. The goal is to seek to empower that community to operate more effectively within the wider arena. Just as people can be disempowered within their communities, communities can be disempowered within the broader society. Hence, the power has to include an analysis of its effect on the community itself, relative to other communities and to other institutions. Political development, therefore, seeks to enhance a community's capacity to operate in the political arena, and is aimed at increasing the power of both the community as a whole in its relation to the wider society, and also of individuals and groups within the community to contribute to processes, activities, and decisions relating to sustainable development. One can highlight three key arenas of political development strategies : consciousness-raising, organising, and social action.

### Consciousness-raising

The importance of consciousness-raising in sustainable development can be emphasised in many contexts. It makes the critical link between the personal and the political, and is aimed at helping people to understand how their personal experiences are affected by larger structural factors. Without such an understanding it is hard to mobilise people for political action, or to participate meaningfully in alternative community structures. The dominant culture effectively separates the personal and the political, thereby leading to the individualising of social problems and 'blaming the victim'. From the ideal of sustainable development, the most important form of consciousness-raising is that which leads to more active participation in community processes, whether formally or informally. Sustainable development depends on active and motivated citizens, and so the important precursor to any more elaborate form of community development is to motivate people

to do something to improve things, and to see their own role in the local community as significant.

Consciousness-raising can take place in a number of ways. The group discussion is a traditional and powerful form of consciousness-raising, often in a group which had a different initial purpose. If one accepts that the personal and the political are inevitably linked, any group focusing on personal issues has become a vehicle for wider consciousness-raising. Thus, assertiveness groups, recreation groups, activity groups, educational groups and even therapy groups have the potential to develop a political dimension. Such groups start from the immediate needs of the people concerned and are likely to make the personal-political link more effectively than a group specifically formed for such a purpose. Other techniques of consciousness-raising can include drama (especially street theatre and similar community-level production), film, video, art, and literature. Creative artists have an important role in commenting on the human condition, and their work can become the focus of consciousness-raising discussions. Of course, one of the potential problems related to consciousness-raising is that it can become simply another form of domination, where an activist or community worker is responsible for 'imposing' a particular perspective or world view onto others. This is precisely the kind of intellectual domination which genuine consciousness-raising seeks to avoid.

If consciousness-raising is seen as one-way educational process, 'teaching the poor about their oppression', then it has failed in its aim, and reinforces the structures of domination and oppression. Consciousness-raising must always employ a dialogic relationship. Consciousness must not be seen as a one-way process, but as a two-way dialogue where each party shares perspectives, understandings and world views in such a way that both will learn from the process and together develop a deeper understanding. This the approach of the catalyst in sustainable development initiatives is not one of superiority, seeking to 'educate' another, but rather one of a human being seeking to engage in dialogue with another human being, where each will respect the other's wisdom, and where the goal is to develop a new understanding together which will lead to action. Although this process is extremely difficult and challenging, particularly for people and communities which have been socialised into the traditional ways of thinking about expertise, 'professionalism', and education. It requires patience, genuine humility, compassion, and a high level of personal commitment.

### Organising

Another aspect of internal political development is the way in which the community organises itself in order to deal with its problems and, in the longer term, to develop alternative and autonomous structures. In order for procedures to be democratic and so that women and men of different cultural, ethnic, and class backgrounds will be able to participate equally in community decision-making, it is often necessary to redefine the traditional decision-making processes such as formal meeting procedure. This is because conventional procedures can be very alienating and excluding. In order to be more inclusive, there are alternative forms of decision-making that can be adopted, most notably consensus-oriented processes, where discussion will continue until not just a majority, but everyone is satisfied with the result. The are ways to delineate the domination of particular people, for example, allowing each person the right to speak only twice in the course of a discussion, or to ensure that a lot of informal discussion has taken place before the actual decision-making meeting, so that

people have had time to consider the issues and talk it through their own way, and in their own time.

At a more formal level, there are other possibilities such as rotating the role of facilitator or chairperson, ensuring that everyone is able to come to a meeting rather than relying on elected representatives, and so on. Care in planning the timing and location of meetings, and the making of adequate transport and child care arrangements, are also critical in ensuring maximum participation. In some instances, the act of organising becomes an external matter. This occurs when the community moves for social action which involves it establishing structures which not only will enable it to operate in an inclusive, democratic manner that ensures maximum participation, but will also assist in increasing its effective power in the wider arena. Another important principle of organising for social action is discipline: people must not be allowed 'to do their own thing' but must act in accordance with the agreed plan of action. Indeed, organising for external action is essentially a practical matter of getting things done, and helping the community to get itself organised to implement effective action plans. Small, task-oriented groups or cells are usually the most effective forms of organisation (e.g., one for media relations, one for legal issues, one for publicity material, one for letter-writing and petitions, one for lobbying politicians, one for recruiting membership, and so on).

### Social action

The achievement of some form of change in the external environment - such as stopping a new road, gaining representation on a particular authority, achieving better public transport etc. - is another key goal of sustainable development. This commonly involves some form of social action, and has long been seen as a critical component of sustainable development. Social action campaigns remain an important part of sustainable development, and indeed they can be seen as an expression of broadening social and political aspirations, and of social movements. Campaigns can cover a wide variety of issues, and incorporate a variety of strategies for change. To be successful, the selection and development of the campaigning strategies must arise from a careful analysis of the social, political, and cultural context, and must result from a developmental process rather than being imposed on the outside.

## Sustainable 'personal' development for communities

### Personal growth

Communities, including relatively traditional ones such as Dingli, are also characterised by an increasing degree of individuation. As a result it is important that, when discussing sustainable development, one does not lose sight of the importance of personal development and growth. One of the main justifications for sustainable development is that the community is a better context for personal development than the more impersonal bureaucratic structures of big government and big business. Of course, personal growth can be politically conservative as it is all too easy to move on to an essentially individual account of the social problems, with its associated 'blame the victim'. Such a response is fully consistent with the individualism and competition of capitalism, and the highly individualised society. Individualism is part of the problem, and from a sustainable perspective it is most unlikely to be an effective solution. Personal growth can also be seen as fully consistent with the untenable but popular propositions that 'you can do anything if you really want to' and 'if you want something enough and are prepared to work for it', you will achieve it'. Such articulated beliefs ignore structural realities, environmental constraints, social limits, and individual differences, which reinforce competitive and exploitative behaviour, and which leads to disappointment and self-blame when people find they have been unable to achieve their goal.

It is important to note, however, that personal growth and development are not necessarily intrinsically conservative and that it is possible to embody such interest in a framework of empowerment and social justice perspective. Through these positions one can develop an approach to personal growth that is more equitable and sustainable in nature. Such an approach to personal growth and development would seek to find ways in which people's individual needs can be met through community networks, structures and interactions, rather than through professionalized and packaged services. It therefore seeks to decommodify personal growth and relocate it within human social interaction. It is still largely the case that at times of personal troubles and stress, people will still seek help from family and friends. However, the limited and fragmented social networks which are part of the *gesellschaft* society mean that people cannot always find such support. A community-based approach would aim to strengthen community interactions so that those supports are more readily available. Similarly it can be suggested that in a flourishing, healthy community people are able to grow and develop personally through their interactions with others, and the artificial environment of the personal growth industry - such as the myriad varieties of established and 'new age' therapies' becomes unnecessary.

## Recommendations (I) : Principles of sustainable development

This section outlines a number of principles of sustainable development which emerge from the interviews with the stakeholders and the policy discussion present in the previous section. They are intended as a basic set of principles that should underlie a developmental approach to all sustainable community work practice.

*Integrated development.* Social, economic, political, cultural, environmental, and personal development all represent essential

elements of the drive towards sustainable development. A programme of sustainable development, therefore, must take all six as part of its strategy. A strategy which will focus only on one or some of these will result in uneven development.

*Immediate goals and ultimate visions.* Sustainable development projects must pay attention to the tension between the achievement of immediate goals and the ultimate vision of a better society. Focusing

on either one means that the others becomes forgotten, the result being either undirected pragmatism or unproductive dreaming.

*Confronting structural disadvantage.* Sustainable development, to be consistent with a social justice position, must take account of the structural disadvantages experienced by the people. Projects must ensure that structural disadvantages are not reproduced, and if possible, seek to confront and counter them in whatever way or ways are appropriate within the specific context.

*Empowerment.* Empowerment should be the aim of all sustainable development. In essence, empowerment means providing people with the resources, opportunities, knowledge, and skills to increase their capacity to determine their own future, and to participate in and affect the life of their community.

*Inclusiveness.* Applying the principle of inclusiveness to community development requires that processes should always seek to include

rather than exclude. All people should be intrinsically valued even if they hold opposing views and be allowed a space to change their position without 'losing face'.

*Community co-operation.* Sustainable development should seek to challenge the dominance of the competitive ethic, and to demonstrate that it is largely based on false assumptions. Instead, it should aim at establishing alternative structures and processes premised on co-operation and consensus decision-making rather than conflict.

*Community participation.* Sustainable development must seek to maximise participation, with the aim being for everyone in the community to be actively involved in community processes and activities. The more that people who are active participants, the more the ideals of community ownership and inclusive process will be realised.

## Recommendations (II) : Strategies of sustainable development

### Inclusive and safe.

- » *Jum Had-Dingli* must serve as a symbol of community integration, with its date preferably moved to a day related to Dingli's history. *Jum Had-Dingli* must serve as a catalyst for the improvement of relations between different non-government organisations.
- » There is a need for an association which safeguards the interests of persons with disability. Despite the plethora of non-governmental organisations and DLC's sub-committees, there is not one which caters for this category of vulnerable persons. The social, personal, and educational needs of persons with disability must be actively met. It is not enough that they are simply allowed to attend the Day Care Centre but the community has the duty to provide them with more up-to-date services.
- » There is a need for vulnerable persons (e.g. persons with disability, housebound older persons, etc.) to be put into contact with a social worker, even if once a year, for both preventive and corrective issues.
- » Another needed association is one which provides a welcoming atmosphere to families settling in Dingli. The *Żaghfran* may introduce new families, even if briefly, whilst contact must be made with them so that they feel as part of the community as much as possible.
- » There is a need for the formation of Dingli Ladies Circle - or something else on similar lines - so that full-time homemakers (generally female) new to the village quickly integrate in the community by making friends and getting to know better the community.
- » Although the Day Care Centre is doing much sterling work, the community must think out of the box as how the work can be improved. For example, with respect to lifelong learning more educational emphasis is needed on 'contemporary' subjects such as financial literacy and pre-retirement courses. The DLC's decision

to utilise the Centre for a talk on household and gender issues on International Women's Day was a step in the right direction and more talks - relating to other social issues - are encouraged to follow.

- » The community must follow the example of those organisations who involve members from different ages, so to organise more intergenerational activities. More interaction is especially needed between late teenagers and young adults on one hand, and older persons on the other.
- » The DLC must devise measures that help to minimise risk factors that could increase family vulnerability such as long term illness, violence or abuse, low income, inadequate or unaffordable housing and addictions. Empowerment and leadership courses targeted to late teenagers and young adults are a step in the right direction.
- » The police station must invoke more respectability from the local community, by being staffed more generously, and by the local police personnel being more visible in aiding residents in their difficulties and maintaining Dingli as a law-abiding locality.
- » There is a need for more police- and warden-patrol to reassure residents that a preventive programme for various criminal behaviours - ranging from burglary, vehicle, thefts from cars, noise pollution, over-speeding, and vandalism - is in place.

### Well-run.

- » The dates, times and agenda of DLC meetings must be better advertised amongst the community residents. The latter must be encouraged to attend the DLC meetings as much as possible rather than simply when an item on the agenda is of personal interest.
- » The DLC must promote effective public participation in decision-making relating to sustainable development (as well as all other issues). There must also be a drive to devise schemes which enable

people to acquire sustainable development skills required for effective participation.

- » Opportunities must be provided for stakeholders to be involved directly in the design, implementation and monitoring of strategies associated with sustainable development strategies, so as to ensure public ownership of the strategies, and hence, promote commitment to action.
- » There is a need for an association whose task is to unite and act as a physical bridge between non-governmental organisations. Representing their organisations, members can work together towards some common aim such as the role of NGOs in *Jum Had-Dingli*.
- » The public must be given more roles in the planning to celebrate *Jum Had-Dingli*. Councillors and non-governmental organisations may twin with residents so that this day will be less perceived as something official but as something that stems from the grass-roots.
- » It is important that the community provides opportunities for its residents, especially those who came from outside villages/cities and children not attending the local primary school, to learn more about Dingli's unique heritage.
- » The community must look for local and European Union funds to preserve Dingli's heritage - such as *L-Ghajn* and *L-Ghajn tal-#asselin* - and making them more available to the public in a user-friendly way.
- » Art appreciation courses and lessons in local traditional crafts such as lace making, along with art and photographic exhibitions on Dingli, must be implemented on a frequent basis if the community is to assert its cultural heritage.
- » The DLC must continue its planning of *Dingli AgroFest* which would surely contribute strongly both to the local economy as well acting as a celebration of the community's culture, history, and traditions.

### Well-connected.

- » The DLC must ensure closer integration of transport and land use planning to increase the use and efficiency of public transport rather than an increased reliance on cars. It is hoped that the reform of the national public transport system is a step in this direction.
- » Higher residential densities and mixed-uses of dwellings that are close to the Dingli inner zone must be promoted so as to reduce need for travel. Permits for business and shop-keeping activities must ideally only be given in Dingli's inner zone.
- » Methods must be introduced that encourage residents to reduce over-dependence on private car use and the need to travel, and to make more use of public transport. The promotion of more efficient use of parking and the introduction of maximum parking standards for new developments, especially in the inner zone areas, are to be warranted.
- » The DLC must encourage local walking routes, both as a leisure and a healthy activity, by promoting such routes through the publishing

of a booklet. The contacts already established with the Rambler's Association is a step in the right direction.

- » The DLC must encourage more cycling activity in the community, especially in the country zones. In collaboration with cyclist associations it may choose to organise safety awareness campaign for the village residents (perhaps starting at the primary school) focusing on cyclist road safety, bike check up and protective gear - and consequently, organise bicycle rides open for all age groups to cycle round different parts of Dingli and surrounding areas. During events literature hand outs and a talks about traffic awareness and safety are encouraged.

### Well-served.

- » *Social services.* The purpose of sustainable development is to re-establish the community as the location of significant human experience and the meeting of human need, rather than to rely on the larger, more inhuman and less accessible structures of the welfare state. A sustainable community must include the following services :

- » **Children:** Apart from supporting average children in the community by improving their opportunities for learning and leisure, the DLC must liaise with specialised organisations (such as Appogg) to support families, parents, and children who are experiencing socio-emotional difficulties. If possible, the services must be available in the local communities with the aim of preventing their situation from deteriorating and resulting in a crises. The DLC's sub-committee responsible for children affairs may take a leaf of what is available in other parts of Malta by coming up with a small number of trained volunteers who provide practical help to parents with children of 5 years or under. The first step, perhaps, is for the DLC to organise parental skills for the Dingli community.
- » **Adults:** The DLC must also bear some responsibility for the quality of life of adults in the community, with the possibility that those who find themselves in personal crises are encouraged and helped to access psychological and family therapy services, and if the cases warrants, even Domestic Violence Services. It is well-known that adults are reluctant to seek help from non-family sources but the DLC must ensure that when this occurs they will be met by a valid support team that leads them to the right professional service. Support must be offered to adults as individuals, with social services contributing to their psycho-social and physical areas of development, and working towards the strengthening of the family unit and the home environment.
- » **Older adults:** Older persons require other unique services, some of which - for example, applying for the Kartanzjan and receiving the annual flu shot - are already available to them from the offices of the DLC. More information is also warranted on how older persons can experience a more active life by providing leaflets containing information of age-interest associations such as the University of the Third Age. There is a greater need of emphasis is to be made on the services available from the central government and other public-private partnerships such as the MMDNA which enable older persons to continue living in the community. As a last resort, older persons must also be able to access

information on the steps required to apply for entry in a residential/nursing home.

- » **Persons with disability:** Such individuals required special social services, most especially, information of all services and benefits available to them and their family in Malta. This service is of utmost importance since from time to time, these services change and others are introduced. As a result the DLC, though the newly formed association for the need of persons with disability, must have up-to-date information on the health provisions, educational services, employment opportunities, day services, housing and residential services, transport and other community services, special aids and information technology services, leisure opportunities, and contact information of national organisations that provide aid and services to meet the need of persons with disabilities. It is important that shops are accessible, signs are put up next to ramps so that cars do not obstruct them, street furniture do not obstruct pavements, and if possible, an accessible platform is constructed at the right side of the Dingli Cliffs so that people with mobility disability can enjoy the scenery in the best possible manner as well. It must be noted that the ramp at the *Kappella tal-Madliena*, situated at the left side of the Dingli Cliffs, is a step in the right direction.
- » *Health services.* The DLC must take the necessary steps to ensure sustainability of the public health services provision in a situation of both higher demand as well as overall increasing health care costs, with a focus in primary health care. The DLC must support the non-governmental organisations and self-help groups to become important stakeholders in the health care schemes, including the following services: community nursing services, palliative care, physiotherapy, occupational therapy, psychiatric care, communication therapy, dental care, and podiatry, midwifery care.
- » *Education services.* Local non-governmental organisations, together with the DLC, must recognise that education is the key ingredient in improving the quality of life.
  - » **Empowerment and Leadership courses:** In contemporary times, the key challenge addressed in community studies is to give people back their rightful place in their locality. Every person is a leader by virtue of his or her longevity as their experiences - whether extensive or short - are a treasured legacy. For communities to be sustainable this abundance of life can no longer be put at the side but agencies must create the conditions under which people around the world can learn, grow and develop their potential to the end of life. Educational courses for empowerment and leadership would challenge residents to ask and eventually answer the following questions: How do we develop the resources and leadership potential of our community? How do we turn our community from an expensive wasteland into a fertile period of growth and development?
  - » **Education for sustainable development:** Following Briguglio and Pace (2004), education services for sustainable development must be at the centre of what is available in the community. Such programmes must aim to (i) foster public awareness about the advantages of sustainable development, and organize educational activities towards

this end, (ii) encourage local communities to develop ESD programmes aimed at empowering citizens to take an active role in environmental decision-making fora, (iii) promote the concept of value-based action, (iv) organise training for leaders and their members on sustainable work practices and processes, and (v), encourage the responsible management of the institution, prudent energy consumption and water usage, and sustainable waste management schemes, including recycling, and participatory skills.

- » **Older adult learning:** Older adults are generally left out in the cold, and the DLC together with appropriate agencies, must seek to redress such a lacuna. Planners must resist to deliver courses which focus on health-related issues as these are heavily over represented at the Day Care Centre and must instead plan more contemporary subjects such as financial literacy, consumer education, literacy projects, and for those who will join them in a couple of years, pre-retirement courses.

### Environmentally sensitive.

- » The identification of fund research to gain a better understanding of local biodiversity, that includes as one of its objectives the establishment and funding of a national inventory and database of biodiversity, is encouraged.
- » Nature experts, if possible from the village community, must be engaged to examine and legally guard all rare and/or threatened endemic species, and other locally occurring species of international importance, and take active measures for their conservation.
- » It is crucial that all obligations under existing international environmental treaties on biodiversity are met, and that sub-committees are set up to be responsible for implementing these treaties with the necessary resources, personnel and administrative machinery.
- » Educational initiatives must be implemented so as to improve the awareness of Dingli residents of the local surrounding (sometimes unique) biodiversity such as the Blue Rock Thrush (Maltese national bird) and the flower Autumn Buttercup.
- » The DLC must protect the open countryside from uses which are harmful and more appropriately located in the urban areas. Codes of practice for good agricultural and organic practice must also be adopted.
- » The sterling work being done in encouraging and educating residents on waste prevention, minimisation, reuse and recycling must be continued through the medium of educational leaflets and on the DLC's website.
- » The present facilities for the separate collection of recyclable waste (metal, glass, and plastic) must be sustained by making sure that they are emptied regularly and by locating other possible avenues for bring-in sites

## Well-designed and built.

As the Ministry of Finance, the Economy and Investment's (2009) Pre-Budget 2009 Document rightly pointed out, the inconvenience resulting from development by the construction industry has been mitigated, to some extent, by the introduction of the Environmental Management of Construction sites in 2007. However, more needs to be done, particularly to address the concerns that demolition and excavation activities cause to third parties. The levels of concern which construction sector may cause to third parties may be very distressing. People are not only concerned about their health and safety but they are also concerned about the damages that they may sustain as a result of such works. In the circumstances, the DLC must liaise with the central government so as to ensure that

- » all construction activity and, in particular, demolition and excavation works are carried out according to good practices and in a manner which is least likely to cause damages to third parties;
- » all construction activity is covered by an appropriate insurance policy against damages to third parties;
- » residents, adjoining construction sites, are provided adequate advance information of what any nearby construction activity shall entail and to give them a means for redress if what is being proposed is a cause for concern.
- » The reduction and reuse of building material and proper disposal of building waste in approved sites must be strongly promoted so that new sites are not continually contaminated with building debris and other types of construction litter.
- » Pressure must be made on the central government to impose deadlines for finishing new buildings in the community so as not to leave the empty structures in 'shell form' for more than a number of months.
- » The contribution of tourism to the local economy must be improved but in a way that investment is channelled only towards resource-efficient segments and to less resource-costly (that is, environmentally, economically, socially) areas. This ensures that resources are allocated to their best use.
- » The quality of service offered to tourists (even Maltese visitors) must be improved so that the Dingli's tourism product - especially around the Dingli Cliffs area - is upgraded considerably - thereby, delivering value and customer satisfaction.
- » Tourism development must be framed in sustainable development policies that fully respect and endorse the locality's environmental capital, and must be never let to impinge on the Dingli residents' quality of life.
- » Programmes must be implemented that exploit Dingli's unique cultural attractions and heritage sites, targeting tourists, and local

Maltese from other villages and cities, as well as pupils in primary and secondary schools.

- » The built environment must be managed in a way to ensure the best possible quality of life, with minimal risks to social and psychological health, and to the fostering of cultural and social identity of the local community.
- » The town centre must be revitalised, thus making it more viable, and improving the efficiency of its use. In this respect, the DLC's efforts to have some roads in Dingli's inner zone fully pedestrian is a step in the right direction.
- » Considering the rising numbers and percentages of older persons that Dingli is going to experience in the coming decade or so, it is imperative that the community commences what is generally termed as senior smart planning which basically refers to a community ensuring that future cohorts of older persons live in an enabling environment. It is not the scope to flesh out a detailed senior smart planning map but it is opportune to highlight the principles that such planning must be based on :
  - » **Facilitate older persons' independence:** Planners need to be guided by the premise that quality of life in later life is highly premised on the ability to carry out life's activities within a normal community setting, to be able to make choices about these activities, and to have a degree of control over one's life
  - » **Recognise diversity of older persons:** From the outset, planning for seniors must accept that older persons are not a homogenous population and that they differ highly by age, ethnicity, gender, income, education, frailty, and so forth, each of which may be a factor in shaping their everyday geography.
  - » **Reflect the progressive ageing of older persons:** The age composition of the seniors population is not static. It is continuously changing, with current cohorts growing older and new cohorts being added. Hence, the needs of the older population need constant and rigorous review.
  - » **Respect the everyday lives of older persons:** Just like younger people, older persons experience a flow of daily life that takes place in a variety of settings and is marked by numerous interactions. They have various roles, and these roles change as do their homes, families, bodies, and communities.
  - » **Embody the integral relationship between housing, transportation, and community support:** Older persons are a diverse group and their needs in housing, transportation, and community support, will be diverse. An array of options must be provided where possible to allow them to exercise choice according to their needs, aspirations, life history and socio-economic situation.





## Acknowledgements

This study would not have been possible if it were not for the discussions with various residents in the Dingli community. I have also benefited from healthy discussions with Ian Borg (Mayor at DLG), Jacqueline Azzopardi (Councillor at DLC), Paul Pace (executive Secretary at DLC), and Dorothy Degabriele (Day Care Centre), plus representatives of the following non-governmental organisations : Dingli Scouts, Dingli Girl Guides, St. Mary Band Club, External Feast Committee, Salesian Oratory, MUSEUM (Boys' branch), *Ghaqda Talent Dingli*, and the Labour Party Club.

On a personal note I also thank Professor Peter Mayo who for the past two decades has willingly served as my mentor, and continues to this very day to contribute to the development of my present value judgements and learning capital. Of course, all the faults in the report remain my own.

## References

Azzopardi Cauchi, J., Formosa, S., and Scicluna, S. (2010) *Dingli survey : A socio-criminal analysis of a rural village*, Dingli : Dingli Local Council.

Briguglio, L. and Pace, P. (2004) *Educational for Sustainable Development in Malta*. This paper is a revised version of a case study prepared for the Expert Meeting on Capacity Development for Sustainable Development in SIDS : Building Partnerships for Sustainable development through Education, Public Awareness and Training University of South Pacific, December 3 to 8, 2003 - available online, accessed on 12/02/10 at [http://www.um.edu.mt/\\_\\_data/assets/pdf\\_file/0006/63861/education\\_esd\\_lbriguglio\\_ppace.pdf](http://www.um.edu.mt/__data/assets/pdf_file/0006/63861/education_esd_lbriguglio_ppace.pdf)

Ministry of Finance, the Economy and Investment (2009) *Pre-Budget 2009 Document*, Malta : Ministry of Finance, the Economy and Investment's

NSO, (2003), *Census of Agriculture 2001*, Malta : National Statistical Office.

NSO, (2006) *The University of the Third Age*, Malta : National Statistical Office.

NSO, (2007a) *Census of Population, 2005, Volume 1 : Population*, Malta : National Statistical Office.

NSO, (2007b) *Census of Population, 2005, Volume 2 : Dwellings*, Malta : National Statistical Office.

NSO, (2007c) *Education Statistics*, Malta : National Statistical Office.

NSO, (2009) *Social Security Benefits : A Local Perspective*, Malta : National Statistical Office.

Yin, R.K. (1989) *Case Study Research*. Newbury Park, London : Sage.







## Chapter 4

# Criminal Issues

Jacqueline Azzopardi Cauchi, Saviour Formosa, and Sandra Scicluna





This chapter analyses the crime-victimization trends in Dingli. Crime serves as a gauge through which a community assesses that 'social-glue' factor entitled *social cohesion*. Any research on society requires a study of the interactions taking place within the community, across time and space. This study process entails understanding the internal and external interactions within and between the Dingli individuals, organisations and external agents. Whilst everyday interactions deal with daily norms, extraneous incidences to normal interactionism create abnormalities that reduce the social cohesion which serves as the glue that makes the community tick and helps to maintain social equilibrium. Crime is such a factor and causes a major intrusion into daily norms.

Sustainability studies encompass the interactions between the physical, environmental and social environments. Dingli constitutes an area inherently constituted of the three categories which in turn causes a wider range of offences to be recorded. Crime is found in all three environments and requires deep investigations that are supported by official data from such agencies as the local and national police and security agencies as well as through data gathered from such tools as the crime victimisation survey. The latter, was also the tool used to investigate the status of local crime issues, if existent, and also to identify the level of safety experienced by the Dingli inhabitants. Once such levels of crimes have been established, crime-prevention activities can then be taken into account in order to establish the best strategies to employ in order to reduce and hopefully eradicate all offences in an area. Whilst the latter would prove very difficult to ensure due to human nature as well due to new opportunities offered by affluence which serves as a main attractor for crime, it is society's duty to ensure its implementation and enforcement of crime-prevention strategies.

Crime-prevention strategies require the establishment of initiatives that help reduce crime. These range from simple gating (gates at alley entrances), remote sensors (CCTV), increased police beats to more community interactive initiatives such as neighbourhood watches

which require more villager interactions that help build up social cohesion.

Crime-prevention strategies need to be sustainable, moving away from a situation of quick-fixes that try to react to crime targeting the short-term and lack planning for the strategic long-term option. Short-term strategies will only enhance the problems to resurface at a later stage. Thus sustaining the community for a high-safety level, the local council needs to instigate long-term planning, a targeted spending approach to maintain safety standards and create effective community-public-private partnerships to ensure its maintenance. This includes empowering the community entities such as clubs and groups (youth, sports, religious, etc), working with public executive agencies to ensure enforcement and finally to bring in private agencies inclusive of overseeing security agencies to monitor areas such as the Dingli Cliffs' most sensitive sites, archaeological sites, etc. These will help to sustain a high level of safety and security in the areas frequented by non-residents and together with a functional neighbourhood watch should first reduce and then maintain a low-level crime index.

Sustainability can only be achieved if the Local Council can maintain a continuous pattern of activity which ensures that cohesion is maintained throughout the execution of the mandate, especially since most initiatives fail during the first few months due to a perception that changes will occur rapidly. In terms of crime, a long-term approach needs to be taken as changes may take months to be discernable. This requires repeated and sustained reinforcement from the community leaders.

These issues were taken into account in designing the survey on victimisation in Dingli, a study aimed at understanding the dynamics that make crime tick in the locality. Following a series of interviews, the study sought to understand the crime structure and the perceptions resulting from the victimisation approach would eventually lead to the initiation of crime-prevention strategies aimed at reducing and sustaining low levels of crime.

## The Study

The interviewees were asked a number of questions regarding their and their immediate family's experience as victims of crime. Three hundred individuals were chosen and asked whether they or their family members had been victims of crimes in the last year. They were also asked about the perceived safety of Dingli and which areas are considered dangerous, and therefore avoided. While drawing up the sample the method of purposive reduction and random sampling was used i.e. while every individual living in Dingli had the same chance

of being chosen, no two individuals, living in the same household, were interviewed. The overall results show that Dingli is a safe place, with both official statistics and this survey confirming that Dingli is one of the most crime-free communities in Malta. The most common crimes were vandalism on cars (12.6%) and car thefts (6.3%), however while all car thefts were reported to the police only half of the cases of vandalism had been officially reported.

## Methodology

### The choice of questions

This survey was administered after a list of questions was prepared encompassing three main sections, namely: the interviewee's background, the crime factor, and the section relating to those who

sought information about Dingli residents' perceptions in regard to their village. These sections were divided as follows : information about the interview and the person conducting it (section A), introduction of the interviewer and the first questions about the person, family and home of the interviewee (these include: education, work and cultural

participation) (section B), preliminary questions that served as preparation to sections D to O that deal with crime (section C), specific questions relating to vehicular crime (section D), questions relating to theft of cars/vans/trucks (section E), questions relating to theft from cars/vans/trucks (section F), questions relating to vandalism on cars/vans/trucks (section G), questions relating to thefts of mopeds, motor scooters or bicycles (section H), questions relating to break-in thefts (section I), questions relating to attempted break-in thefts (section J), questions relating to theft (not pick pocketing) from interviewee (section K), questions about theft that occurred without him/her being aware, until it was too late (such as theft of mobiles, cameras, MP3s, MP4s, purses, wallets, handbags, clothes, jewellery, sports' items - at work, school, places of entertainment, on public transport, on the beach, or in the street) (section L), questions about sex crimes - on women and men (section M), questions about assault/threats (section N), questions about fraud (section O), and finally, questions related to Dingli (section Z).

The questions were constructed using different levels of analysis which included analysis of previous surveys, with the addition of questions that were designed especially for Dingli. The questionnaire was put together in a way that it could be easily followed. The questions were revised by the authors of the report and also by council members with the help of Dr. Marvin Formosa, Mr. Kenneth Micallef and Mr. Marko Micallef. Necessary changes were made to any remaining questions.

### The choice of interviewer

Because this survey had to be in the form of an interview, it was decided to give practice to interviewers who had been selected among students of criminology attending the Institute of Criminology at the University of Malta. The process required reviews of the questions and practice of what is called a pilot study on different persons to make sure that the questions were understood and others that were not clear were eliminated or changed. 30 students were chosen and given 10 surveys each. Four others were given the job of inputting the information collected utilizing software to help in the analysis.

### The choice of interviewees (sample)

The project used a methodology that is based on what is called multi-method which is made up of purposive reduction and random sampling where it was ascertained that every family was represented by one person - so that each family had the same chance of being chosen. When the list of individual families (could be varied from one person to a big family) was ready, the second step was to choose which persons were to be interviewed. This was done by making a list based on random sampling that involved taking the name of the first person listed in alphabetical order based on the surname which was listed based on the street name. From there a name was chosen out of the lot to make sure that every street was represented. This process ensured that three hundred names would be chosen with none being pulled more than once. In addition, two other lists were prepared in case persons were not found or refused to take part. There were

several of these so the second list was nearly all used but there was no need for the third list. The basis of the sample was taken from the last electoral register.

### The process of the interviews

From the feedback we had from the interviewers, they were well received by the selected persons, who were also ready to help. First there had to be a communication by phone to be followed by the proper interview. The interviewers were asked to phone the interviewees to see at what time they could go to talk to them and a protocol was established with respect to acceptable behaviour during the interview. Where the persons were not found or did not want to take part, names were pulled from the second list - as mentioned above. We had to use a considerable amount from the second list. This may have happened because of different factors, one being that the people did not know about the research, the research took place at an inconvenient time or the telephone calls were not made at a convenient time to the interviewees.

### The analysis

The analysis was conducted according to an established methodology process known as quantitative analysis. Due to the fact that many interviews took place (300) software was needed to make sure that the process would be statistically stable and representative. So when one considers the analytical aspect, this was performed via a questionnaire that was fed into software called SPSS (Statistical Package for the Social Sciences) and from it the necessary statistics were taken to finalise this report. The results found in this report are based on a process known as descriptive statistics which gives the relative figures to every question. Every section was analysed as shown in the report. While socio-cultural and socio-economic questions were individually analysed, the other questions tackling the topic of crime were globally analysed because of different factors such as the small number of reported cases; as well as the fact that it makes more sense to see the uncommon reasons motivating certain behaviour because they shed more light on the problems and give a clear picture of how things are going without having to go into the details of one particular case.

### The report

The report was based on a descriptive process of findings from the questions as well as analysis of different factors that shed light on why one fact or another was discovered. The report gives descriptions of findings and uses tables and graphics where possible.

### The interviewees

All the interviewees live in Dingli. These individuals were well motivated to participate in the interview as seen from table 4.1 (92.7% had a good or very good motivation). Approximately 300 people refused to be interviewed for various reasons: some could not make it, others had bad experiences in the past and others were not interested.

**Table 4.1: Levels of motivation to participate in this research**

		Frequency	Per cent	Valid Per cent	Cumulative Percent
Valid	Very good	165	55.0	60.0	60.0
	Good	90	30.0	32.7	92.7
	Bad	20	6.7	7.3	100.0
	Total	275	91.7	100.0	
Missing	System	25	8.3		
Total		300			

We know that most of the interviewees were men, but the number of women was only about 7% less. As regards their role in the family, we know that the majority were/are parents. It is shown that in Dingli we find that most of the people are about 40 years old. It is shown that the absolute majority of the residents in Dingli have been living here 10 years or more. Nearly all the Dingli residents (98%) are Roman Catholics. Only about 0.5% said they were Anglicans and 0.5% said

they were Protestants. About 1% answered that they have another religion that was not mentioned (the interviewers asked them if they were: Roman Catholics; Anglicans; Protestants; Muslim; Buddhists or of another religion). It is a known fact that Jehovah's Witnesses are present in Dingli, so this 1% might consider themselves Jehovah's Witnesses.

## Family relations

In Dingli most families are made up of four persons, followed by families of three and five. As expected, the least one finds are families of seven or those of more than ten. The most common number of residents in one house is four, followed by homes housing three people. Most of the houses were built in 1978/79 and in 1990/1. Most of the houses in Dingli are terraced houses - then there are maisonettes (18%). It appears that the absolute majority (more than 80%) of the houses in Dingli are in very good repair, while only about 18% need some work done. Most of the houses in Dingli have eight rooms, followed by those

with seven and others with ten or more. The absolute majority (77%) of residents in Dingli own their own houses (which have been paid for) while 18% are still paying for them and 5% only live in rented houses. More than half (52%) of the rented houses are rented from private owners and 45% from the government. The absolute majority (64%) of Dingli residents are married while nearly a third (27%) are not. Nearly all the interviewees (98%) answered that their children are their own (few said that they were adopted or are the children of a partner).

## Social Capital

It seems that the Dingli families are still close to each other; in fact about 90% of the parents see their children more than once a week, although it would be well to keep in mind that the majority of the interviewees are 40 years old, so their children are still young and still live with them. However, considering the fact that we are speaking about nearly 90% of the interviewees, these statements are to be construed as positive, because though there are more residents in their 40's, there are also a lot of elderly people. The majority (56%) of Dingli residents see their grandchildren often - at least once a week. Positively, the absolute majority (73%) of Dingli residents see their neighbours at least once a week. Out of these, 53% meet even more than once a week. However, it is worrying that 8% of the interviewees said that they never see their neighbours. About 34% meet more than once a week - naturally, this is expected of siblings who still live with their parents. However, 24% (nearly a quarter of the interviewed) who answered that they meet their brothers and sisters at least once a week is a positive indication, especially when you add the 15% who said that they meet twice or three times a month. This positive indication continued to show when the majority of the interviewees

(54%) answered that they meet their friends once a week and 37% said that they meet them more than once a week. However, it is worrying that 15% admitted that they never meet their friends. Does this mean that they have no friends? Or perhaps, are they isolated because they come from other parts of Malta and Gozo, leaving their friends behind, and have no contact with them? Maybe they are finding it difficult to integrate with the Dingli community. If to these one adds the 12% who see their friends less than once a month, the situation can be viewed as an alarming one.

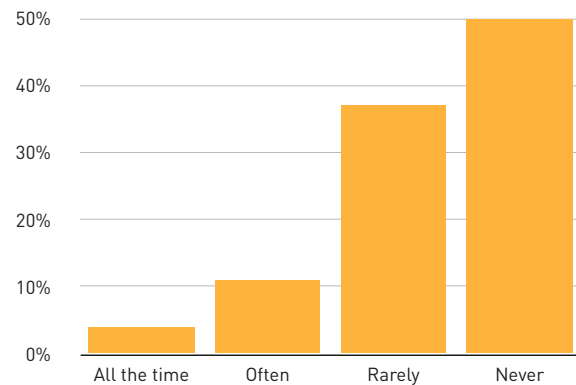
When asked the question whether they seek help if they need someone to take them somewhere, one third (32%) said they ask their children, a quarter of the interviewees (25%) said they asked their parents, and 20% ask their brothers. Within the same group of questions, when asked from whom they seek help if they are ill, 38% said they ask their children (even here we understand that 38% of those interviewed have older children). However, about a third (32%) said they would ask their parents for help, while 17% would ask the help of their brothers. In addition, we discovered that maybe in the case of emotional problems

most of the Dingli residents look to their children (28%). So we can understand that a third of interviewees have children who are old and mature enough to provide such support. A quarter (25%) of the interviewees seeks the help of their friends when they have emotional problems. However, 20% go to their parents when they have personal problems. This indicates that a good number of parents have a good relationship with their children. And the fact the 25% go to their friends when they have emotional problems does not mean that they do not have a good relationship with their parents, but that they do not want to worry them or they are embarrassed to speak about certain problems with them. On the same theme, when they were asked who they seek help from when they need an errand or some small task done, a third (32%) ask their children, 27% ask their parents and 23% ask their brothers or sisters. This can indicate that in Dingli the family ties are still strong. It is nice to see that when the parents are in good health they take care of their children but when they start having ill health it is the children who take care of them.

Figure 4.1 shows how Dingli residents feel about loneliness. Half of the interviewees stated that they never feel alone. More than a third (35%) said that they rarely feel lonely. However, 15% said that they

never see their friends, 10% also said that they often feel lonely and 5% said that they feel lonely all the time. So in this case one finds again the 15% that appear to be isolated.

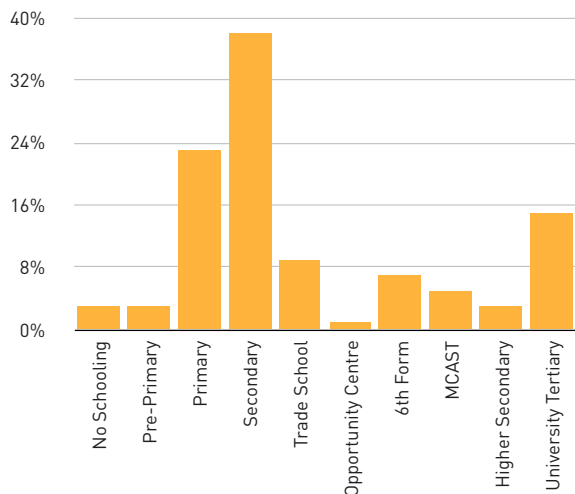
**Figure 4.1: Do you feel lonely?**



## Education level

It appears that most of the Dingli residents (34%) have completed up to secondary level at school (Figure 4.2). It also appears that a substantial number (22%) attended only the primary level. 12% went to university. 8% attended a trade school. 6% attended the 6th Form. 5% attended MCAST. 4% attended the Higher Secondary School. 1% went to an opportunity centre while 8% have experienced little learning (4% less than primary level) or none (4%). In fact, it is clearly shown that the highest level of education attained by the Dingli residents is 11 years in school (possibly, they did not even finish secondary school). This figure (17%) is followed by those people (9%) who have attended primary school. 4% never went to school.

**Figure 4.2: What is your level of education?**



The study tells us that, although many Dingli residents (92%) know how to read and write, we certainly cannot ignore the 8% who said they were illiterate. These can surely benefit from the teaching that is conducted in Dingli on literacy. Some 30% attend the courses (on

various subjects) that are offered by the primary school and local council.

When asked where they pursued their primary education, 90% answered that they had attended the state school, 8% went to church schools, 1% attended private schools and 1% pursued their education elsewhere. For their secondary education, 87% attended government schools, 8% attended church schools, 4% attended private schools and 1% claimed to have received their secondary education elsewhere. The same can be glimpsed where the post-secondary level is concerned, in which case 90% attended state schools, 4% church schools, 4% private schools and 2% other schools. Regarding academic qualifications, the study shows that: well over a third have a school leaving certificate, 20% have O-levels, 16% have other qualifications; 12% have A-levels; with the rest holding some tertiary qualification. One out of every five residents (20%) uses the library facilities in Dingli. The rest of the interviewees (80%) admitted that they do not frequent libraries in Dingli. When asked if they use a library outside of Dingli, 18% replied "yes", whereas 82% replied "no". Hence, it might be that only 2% of the residents make use of a library in Dingli. It is possible that they do not like to read much and it is because of this that 60% do not even read the daily newspapers. But they might be using the Internet or hearing the news to keep themselves up to date. When asked whether they help their children in their homework, the absolute majority (59%) replied "yes" and 41% said they do not help their children in their homework. But this might not be alarming because there are many reasons why children are allowed to study on their own. For example, there are children who insist to be left on their own – and we think, if this does not happen out of pride, then it is a sign of independence and must be encouraged. However, if from these 41% there are children who, although backward and in need of help, are being left on their own or are totally ignored, then, we need to be worried. So, the initiative of the Local Council to give help to children in doing their homework is a needed one. It is important that this assistance is availed of by children who have the most need of it.



As stated above, a third (30%) of Dingli residents appear to be attending courses offered by the primary school, the Local Council...etc.... Surely, this is a good sign; however, we cannot ignore the fact that 70% of the interviewees said they did not attend these courses. It seems that 70% of the residents feel at ease when speaking English – on the contrary, one third (30%) feel uncomfortable. Maybe later on, conversational English courses can be put together for these residents.

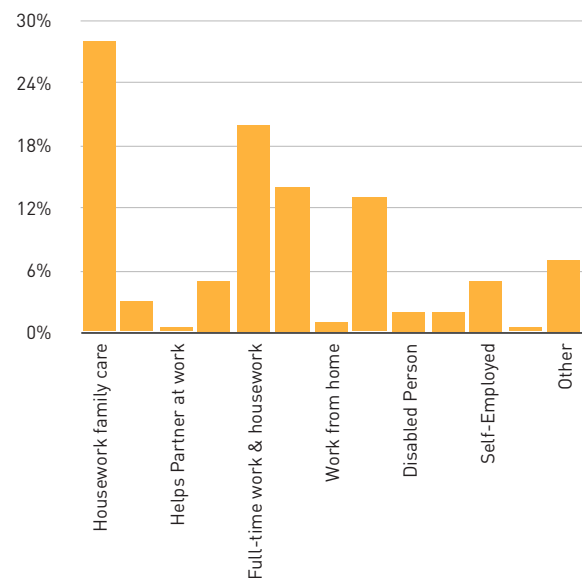
When it was investigated how many in fact used the computer, a third (30%) of the residents said they have no computer at home (70%

have it); a third have no access to the Internet from home – maybe because they have no computer; although 70% have a computer and access to the Internet at home, it is 58% who use the computer on a regular basis to send e-mail...etc.... while 42% admitted that they do not. Maybe a scheme may be introduced whereby those who have no computer and Internet at home because of financial problems may be provided with at least a second hand computer and possibly, internet service providers can be urged to sponsor these families. This way, the digital divide could be narrowed down.

## Occupational status

At first we were very much surprised when we saw that the biggest number of interviewees (about 28%) were those who take care of their house and family full time (figure 4.3). Although we thought that this was a very positive thing, we felt it difficult to accept, when there are 7% more men interviewed than women. We could explain this result when we noticed that along with the 12% who said they worked full time, there were a considerable number (11% who are retired, 6% self-employed, 0.5% self-employed and 8% who did not want to say what they do) who were not employed. This might explain the high 28% of those who take care of the house. We do not imagine that there were many men from the 6% who said they worked full time and did all the housework themselves. However, we might be mistaken. 2% said that they were studying; the same number of persons said that they take care of a disabled person, 0.5% help their partner with his work and 3% work only part-time. It does not seem that many of the residents' jobs necessitate travel (only 16% needed to go abroad for work in the last 3 years). Many of the interviewees (32%) - of whom the majority we know were men - said that the responsibility of the running of the household and the family fell on their partner. Many (17%) of the partners (the majority of whom appear to be women) who work outside the home also do the housework. 16% said that their partners were retired while 11% admitted that their partner works full time and also does the housework.

Figure 4.3: Occupational Status

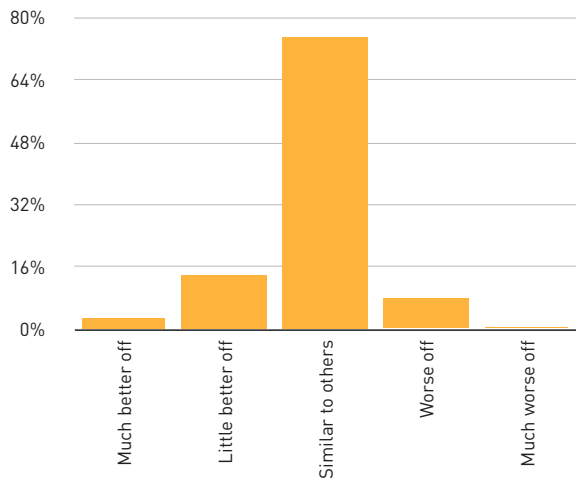


It appears that the majority (56%) of Dingli residents are satisfied with their work while more than a third (36%) are quite satisfied. So, when one considers that 92% (56% and 36%) of the residents are happy with their job, this surely is a positive trend. 4% were indecisive and the other 4% gave a negative answer.

## Financial status

The research shows that while 49% said that they are able to save money, the majority (51%) said that they do not manage to save. However, the number of those who are able to save is not small - and this is a positive thing. The majority of the interviewees (70%) are not satisfied with the amount they save - the rest (30%) are. When asked whether they had credit card/s between them (the partners), the majority (70%) replied "yes", 30% said "no". Although it resulted that there are more families in the 20,000 Euro (Lm8,000) per annum bracket, the interviewees appeared not to want to divulge this financial information, so we cannot rely too much on this indication.

**Figure 4.4 : Your family's financial status – Do you consider your family:**



When asked about the financial status of their family (figure 4.4) about 76% said that according to them their financial status is like that of other families – normal; 15% were convinced that their family's

financial situation was better or much better than that of others; 7% think that they are doing somewhat worse than others; and 0.5% were convinced that their status is worse or much worse than that of others. So, while in the absolute majority (76%) of the residents consider that the family income is in the norm (like other families), 16.5% (15% and 1.5%) were convinced that their family's financial status was better than that of others. Only 7.5% think that their family income is worse than that of others. Although there are few families in Dingli who have a low income, these cannot be ignored and the authorities should always keep them in mind.

The great majority (81%) of the residents are satisfied with their family income. However, it is shown that one in five of the residents (19%) are not. This is a positive sign, but 19% is not a figure that can be ignored. When asked if they have a second house, most of the interviewees (84%) said "no", however 16% have another home. The majority (54%) have been abroad for a holiday in these last three years. This is a positive indication of financial status among Dingli families. If a mobile phone is still considered a sign of status, many residents (84%) have mobile phones so one can say that the Dingli family status is not a bad one.

## Community involvement

The survey brought out very clearly the fact that Dingli residents do not involve themselves too much in voluntary work. In fact, 80% said that they were not involved. Some 70% are not involved in any organization. As regards culture, if one can say that eating out is a cultural activity, the majority (52%) of the residents enjoy eating out; 28% did not specify what cultural activities they are involved in; 14% like to go and watch a film at the cinema, 4% go to the theatre to see plays, while only 1% enjoy attending art exhibitions and 1% are those who go to the theatre to enjoy an opera. With respect to another question, the

residents were more honest because to the question, "Do you take part in cultural activities?" they stated that they did not think that eating out was a cultural activity. In fact, the majority (55%) admitted that they never take part in such activities, a quarter (25%) replied "very seldom", while only 20% said that they take part, although not often. It appears that many of the residents (about 70%) do not find time for sports activities. As a matter of fact, 70% said they do not take part in sports, 12% nearly never, 18% occasionally. This is a bit troubling in the context of the residents' physical health.

## Health

When asked how they were feeling 'today' (the day of the interview) many (48%) replied "very well" and nearly a quarter (24%) answered "excellent". This indicates that 72% of the Dingli residents feel exceptionally good. However, 28% are a little worried about their health. It is a positive fact that the absolute majority (78%) of the interviewees do not suffer from any problems such as a disability or lack of health. However, when the 22% who said that they suffered a problem were asked to name it, the answers were very vague, so we cannot rely on

the results pertaining to this question. Maybe the interviewees felt that their privacy was being invaded and preferred to remain silent. On a very positive note, around 80% of interviewees replied that they do not smoke and 70% do not drink. When the interviewees were asked how much they drink, nearly half (49%) replied never, 8% once a month, 7% twice a month, 20% once or twice a week, and 4% from three to four days a week, while 12% drink nearly every day. Therefore, it appears that about 16% of the residents may have alcohol abuse problems.

## Crimes

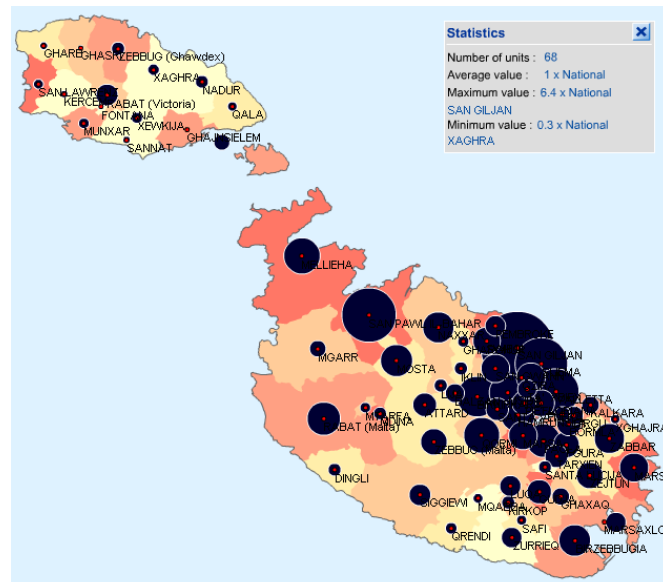
It transpires, from studies that are performed on an annual basis, that Dingli possesses one of the lesser rates of crime in the Maltese islands. In fact, it is clear from the Crimemalta website ([www.crimemalta.com](http://www.crimemalta.com)) and the parliamentary questions that in recent years, as far as global/general figures are concerned, Dingli has such a low crime rate

that it always appears at the bottom of the list for risk of crime in Malta (Figure 4.5). Figure 4.6 shows how Dingli has a low crime rate, a reality which is reflected in several areas such as social cohesion, and tight knit families and communities. In addition, this phenomenon is reflected in the case of burglaries in Dingli, the rate of which is

practically the lowest in almost all the localities of Malta – except in the year 2002 when the rate rose in comparison to the national rate because of some specific burglary cases. A comparative analysis shows that the difference between the localities is so wide that certain other localities register a rate that is seven times the national rate. Thus, a rate of zero or less than the national rate indicates that Dingli is a safe and secure place.



Figure 4.5: Map indicating the risk of crimes occurring, 2006



Source : www.crimemalta.com

Figure 4.6: Risk of crime: 2006

1998	1999	2000	2001	2002	2003	2004	2005	2006
San Ġiljan	San Ġiljan	San Ġiljan	San Ġiljan	San Ġiljan	San Ġiljan	San Ġiljan	San Ġiljan	San Ġiljan
San Pawl Il-Bahar	San Pawl Il-Bahar	Mdina	Mdina	Mdina	Mdina	Mdina	Mdina	Mdina
Mdina	Mdina	San Pawl Il-Bahar	San Pawl Il-Bahar	San Pawl Il-Bahar	Valletta	Valletta	San Pawl Il-Bahar	San Pawl Il-Bahar
Floriana	Floriana	Floriana	Gudja	Valletta	San Pawl Il-Bahar	San Pawl Il-Bahar	Valletta	Valletta
Valletta	Valletta	Mellieha	Floriana	Gudja	Gudja	Floriana	Floriana	Floriana
Ta' Xbiex	Pieta'	Gudja	Valletta	Floriana	Sliema	Sliema	Sliema	Sliema
Sliema	Ta' Xbiex	Valletta	Sliema	Sliema	Floriana	Gudja	Pieta'	Ta' Xbiex
Mellieha	Munxar	Sliema	Ta' Xbiex	Ta' Xbiex	Pieta'	Pieta'	Ta' Xbiex	Gudja
Pieta'	Mellieha	Ta' Xbiex	Mellieha	Pieta'	Mellieha	Pembroke	Gudja	Mellieha
Gudja	Sliema	Pieta'	Marsascula	Msida	Marsa	Ta' Xbiex	Mellieha	Msida
Marsascula	Gudja	Swieqi	Pieta'	Mellieha	Ta' Xbiex	Marsa	Msida	San Lawrenz
Munxar	Marsascula	Marsa	Msida	Marsa	Munxar	Msida	Marsa	Pembroke
Marsa	Marsa	Msida	Marsa	Munxar	Marsascula	Marsascula	Pembroke	Marsa
Marsaxlokk	Msida	Munxar	Għasri	Marsascula	Msida	Mellieha	Marsascula	Marsascula
Msida	Xgħajra	Marsascula	Gżira	Pembroke	Gżira	Kirkop	Xgħajra	Pieta'
Birzebbuġia	Pembroke	Pembroke	Munxar	Gżira	Pembroke	Birzebbuġia	Munxar	Munxar
Swieqi	Swieqi	Żebbuġ (Għawdex)	Pembroke	Xgħajra	Żebbuġ (Għawdex)	Gżira	Birzebbuġia	Marsaxlokk
Għasri	Gżira	Birzebbuġia	Swieqi	Hamrun	Birzebbuġia	Swieqi	San Lawrenz	Birzebbuġia
Gżira	Żebbuġ (Għawdex)	Marsaxlokk	Xgħajra	Żebbuġ (Għawdex)	Hamrun	Hamrun	Żebbuġ (Għawdex)	Paola
Pembroke	Kalkara	Gżira	San Lawrenz	Marsaxlokk	Swieqi	Żebbuġ (Għawdex)	Hamrun	Birgu
Hamrun	Marsaxlokk	Xgħajra	Marsaxlokk	Birzebbuġia	Paola	Xgħajra	Paola	Gżira
Mgarr	Hamrun	Għasri	Hamrun	Għajnsielem	San Lawrenz	Paola	Gżira	Swieqi
Żebbuġ (Għawdex)	Birzebbuġia	Hamrun	Żebbuġ (Għawdex)	Swieqi	Marsaxlokk	Mgarr	Rabat (Malta)	Hamrun
Qrendi	Għasri	Paola	Għajnsielem	Birgu	Għajnsielem	Luqa	Marsaxlokk	Żebbuġ (Għawdex)
Xgħajra	Bormla	Bormla	Paola	Paola	Kirkop	Birgu	Bormla	Xgħajra
Kalkara	Paola	Attard	Luqa	Balzan	Balzan	Munxar	Għajnsielem	Balzan
Kirkop	Qrendi	Qrendi	Qrendi	Mgarr	Santa Venera	Bormla	Swieqi	Kalkara

1998	1999	2000	2001	2002	2003	2004	2005	2006
Bormla	Birgu	Mtarfa	Bormla	Birkirkara	Bormla	Marsaxlokk	Birgu	Ghajnsielem
Santa Venera	Ghajnsielem	Kalkara	Balzan	Ghasri	Attard	Rabat (Malta)	Balzan	Rabat (Malta)
Birgu	San Lawrenz	Lija	Birzebbugia	Qrendi	Naxxar	Qormi	Kalkara	Bormla
Balzan	Mgarr	Naxxar	Naxxar	Attard	San Ġwann	Birkirkara	Naxxar	Mgarr
Paola	Birkirkara	Balzan	Birkirkara	Bormla	Mgarr	Ghajnsielem	Santa Venera	Naxxar
Luqa	Balzan	Dingli	Santa Venera	Luqa	Kalkara	Naxxar	Mtarfa	Luqa
Birkirkara	Dingli	Luqa	Kirkop	Kalkara	Luqa	Santa Venera	Luqa	Kirkop
Isla	Kirkop	Ghajnsielem	Attard	Naxxar	Safi	Balzan	Mgarr	Ghasri
Naxxar	Isla	Birkirkara	San Ġwann	Santa Venera	Mtarfa	Safi	Birkirkara	Santa Venera
Siggiewi	Santa Venera	Birgu	Birgu	Kirkop	Birgu	Rabat (Victoria)	Qormi	Birkirkara
Rabat (Malta)	Naxxar	Santa Venera	Siggiewi	Rabat (Malta)	Qormi	Ghasri	San Ġwann	Qormi
San Lawrenz	Siggiewi	Kirkop	Lija	Dingli	Birkirkara	Kalkara	Ghasri	Mtarfa
Żejtun	Mtarfa	Mgarr	Rabat (Victoria)	Lija	Gharb	San Ġwann	Żebbug (Malta)	Rabat (Victoria)
Attard	Luqa	Qormi	Kalkara	Siggiewi	Xghajra	Mosta	Lija	Lija
Ghajnsielem	Lija	Siggiewi	Mosta	Rabat (Victoria)	Isla	Żebbug (Malta)	Kirkop	Tarxien
Gharb	Qormi	San Ġwann	Fgura	Żebbug (Malta)	Qrendi	Lija	Rabat (Victoria)	Ghaxaq
Rabat (Victoria)	San Ġwann	Żebbug (Malta)	Qormi	Żejtun	Żabbar	Qrendi	Żabbar	San Ġwann
Mtarfa	Safi	Tarxien	Mtarfa	Mosta	Rabat (Malta)	Dingli	Gharghur	Isla
San Ġwann	Attard	San Lawrenz	Safi	Qormi	Żejtun	Żabbar	Siggiewi	Siggiewi
Mosta	Mosta	Isla	Żebbug (Malta)	Mtarfa	Ghasri	Nadur	Tarxien	Żebbug (Malta)
Safi	Qala	Mosta	Dingli	Gharb	Fgura	Żejtun	Mosta	Żabbar
Lija	Fgura	Fgura	Isla	San Ġwann	Mosta	Isla	Isla	Żejtun
Qormi	Żejtun	Rabat (Malta)	Żejtun	Fgura	Lija	Gharghur	Fontana	Mosta
Dingli	Rabat (Malta)	Qala	Rabat (Malta)	Xewkija	Siggiewi	Iklin	Żejtun	Safi
Mqabba	Żebbug (Malta)	Żurrieq	Mgarr	San Lawrenz	Tarxien	Gharb	Ghaxaq	Attard
Santa Lucija	Xaghra	Santa Lucija	Xewkija	Tarxien	Żebbug (Malta)	Siggiewi	Iklin	Gharghur
Żurrieq	Żabbar	Żabbar	Tarxien	Iklin	Santa Lucija	Żurrieq	Fgura	Fgura
Nadur	Żurrieq	Iklin	Żabbar	Żabbar	Iklin	Ghaxaq	Dingli	Gharb
Xaghra	Rabat (Victoria)	Sannat	Mqabba	Isla	Ghaxaq	San Lawrenz	Qrendi	Qrendi
Żebbug (Malta)	Gharghur	Rabat (Victoria)	Nadur	Fontana	Gharghur	Mtarfa	Safi	Qala
Ghaxaq	Mqabba	Gharghur	Gharghur	Żurrieq	Rabat (Victoria)	Attard	Attard	Dingli
Iklin	Gharb	Xewkija	Żurrieq	Safi	Dingli	Qala	Nadur	Iklin
Tarxien	Nadur	Ghaxaq	Gharb	Kerċem	Xaghra	Xewkija	Żurrieq	Żurrieq
Sannat	Iklin	Żejtun	Xaghra	Ghaxaq	Mqabba	Mqabba	Gharb	Santa Lucija
Gharghur	Xewkija	Nadur	Iklin	Nadur	Żurrieq	Fgura	Santa Lucija	Fontana
Fgura	Kerċem	Gharb	Santa Lucija	Gharghur	Kerċem	Tarxien	Xaghra	Xewkija
Żabbar	Ghaxaq	Safi	Qala	Sannat	Qala	Santa Lucija	Kerċem	Kerċem
Qala	Sannat	Mqabba	Kerċem	Santa Lucija	Fontana	Sannat	Sannat	Nadur
Xewkija	Tarxien	Xaghra	Ghaxaq	Xaghra	Xewkija	Xaghra	Mqabba	Mqabba
Fontana	Santa Lucija	Kerċem	Fontana	Qala	Nadur	Kerċem	Qala	Xaghra
Kerċem	Fontana	Fontana	Sannat	Mqabba	Sannat	Fontana	Xewkija	Sannat

However, even in a place considered 'safe', there is always room for improvement. This could be achieved through an on-site investigation or via alternative analyses through which the opinions of residents about crime are disclosed – which rate of crime we have so far established is minimal in Dingli. Nonetheless, despite the satisfactory situation with respect to the crime rate, one may state that any crime incident is one incident too much and causes upset among the residents and the Local Council. Therefore, we asked the residents for

their thoughts about crime and whether they have experienced any in this village.

It is appropriate to reiterate here that the numbers of crimes is so low that it is not feasible to conduct a statistical analysis on a case by case basis; however, it is possible to compare the rates in the categories listed above and to discuss the differences among them. This ensures that those persons who experienced some sort of crime as victims

cannot be identified - especially as Dingli is a small village and word about these occurrences spreads easily. It is interesting to note that from the 300 interviews, in absolute figures, the crimes registered are few in number but not in gravity. The rate of the last five years is low even in comparison with the national crime rate of one year alone; but despite this, the fact emerges that there are some crimes that

raise concern as they recur in higher percentages than others. These crimes need to be given more attention to give Dingli residents more peace of mind. Still, there is no cause for alarm when one looks at these percentages, even where parallels with the national average can be discerned. However, the Dingli residents' reaction to these numbers is worthy of investigation.

**Table 4.2: Crimes in Dingli**

Category	Number	Percentage
E - Vehicles: Theft of	6	2.1%
F - Vehicles: Theft from	16	6.3%
G - Vehicles: vandalism	36	12.6%
H - Two-wheeled vehicles	4	1.4%
I - Theft by breaking and entering	8	2.8%
J - Attempted theft by breaking and entering	5	1.7%
K - Theft (not pick pocketing) from the person of the interviewee	1	0.3%
L - Theft from the person of the interviewee without the latter's knowledge	9	3.1%
M - Sex crimes	2	0.7%
N - Assault/threats	11	3.8%
O - Fraud	7	2.4%

It transpired that the people of Dingli are very shrewd and knowledgeable where crime is concerned and like to engage in discussion (58%) about incidents of crime. One must keep in mind that prior to the start of these interviews there was the commission of a gruesome murder of a young man that was found burned in an oven; and the macabre nature of this case instigated much speculation and

discussion whereas at other times such discussion would not be as animated. Interviewees also discuss burglary and the fear of burglary as well as crimes relating to drugs. In order the ease the interviewee into discussing crime the first question on the subject was a generic question referring to crime.

## Most frequently reported crimes

When one considers that the overall numbers are small, this does not preclude the fact that we have a duty to investigate the topics discussed during the interviews—particularly those relating to the high rate of cases in which the Local Council could intervene in order to prevent future occurrences of the crime. The three categories that can be realistically analyzed relate to vehicular crime: namely vandalism and theft of cars. It is a surprising discovery that threats and assault also have a high rate.

Both in the case of damage to vehicles and theft from vehicles, victims exhibit classic symptoms of victimization: namely, the repeat victim mentality. This has been expressed in several studies and when the victim subsequently either accepts what happened to him/her and lets things be, or reports the incident to the police, or even takes the law into his/her own hands. It can also happen that after a series of crimes committed against them, the victims fail to continue reporting the incidents [see section below on reporting]. One can see that there have been instances of damage to vehicles committed three times, and theft of vehicles committed twice against the same victim.

In regard to neighbourhoods where these particular crimes of damage and theft to vehicles were committed, it has been said that these include mostly places such as the Housing Estate, in the *Ġnien il-Familja* and in areas where one finds many stores and small businesses. Although the rate of cases in rural areas is significant, the fact remains that this area is so large that it would not be feasible to introduce and manage crime prevention strategies in these zones. It would be far more practical to concentrate on urban areas. When the crime rate falls here, then focus can be shifted to the rural areas. Dingli is also a major tourist attraction and is visited by people from all over Malta for its environs, and such fact is a magnet for criminals. Thus, those who leave their property unattended in the countryside should ensure that they have adequate insurance coverage or that the car is locked. The Local Council can initiate an awareness campaign to enlighten the public about these facts and suggestions. With respect to threats and assaults, the number of cases, albeit small in number, is nonetheless cause for concern as the percentage of such cases is a bit high. Although this percentage is not alarming, it warrants investigation into the motivations for this sort of crime.

In the case of theft, repeat victimization is a clear reality as there have been cases of repeated offences (threats/assaults) made against the same person—at times even as many as five times. This has occurred in several environments, both inside the home and out in the open. The Local Council cannot intervene in cases of domestic assault except to conduct a campaign to educate people about how to handle such cases and provide information about the help that is available in these instances (as it was found that few people seek help when victims of domestic assault)—however, the police could possibly assist with those cases that occur in a public setting and thus contribute to domestic assault crime rate reduction. This is especially possible in

the case of incidents happening in *Ġnien il-Familja*. In regard to the fourth category of theft by breaking and entering, the numbers are too small in order to issue a chart to determine the hotspots specifically for such crimes. Each case occurred on a different street and it is not possible to arrive at a scientific determination by taking into account a scant number of crimes committed in scattered parts of the village. In this case it would be appropriate for the Local Council to work with an external organization with the goal of educating families about how to make their home more secure and safe, especially in those cases where a home does not have specialized security, locks, or insurance against intrusion.

## Reporting to police



Predictable, there is a certain number of crimes per year that are reported to police, but the incidence of certain crimes is cause for concern. While an individual can recoup his/her loss from the crime by claiming insurance, and utilizing all the resources at the victim's disposal, there is a high rate of crime reporting for crimes such as theft by breaking and entering, as well as extreme threats that instill fear in the victim; however, in the case of other crimes, few reports are submitted to the police. There are several reasons for this, such as, lack of hope that the property stolen will be returned, or because the victim doesn't view the act as a crime, or even because the victim cannot think of a resolution to the issue that will not take a lot of his/her time, thus adding on to the pain and suffering of being a victim

**Table 4.3: Reporting to Police**

Category	Percentage of cases where police reports were filed
E - Vehicles, Theft of	100%
F - Vehicles: Theft from	41%
G - Vehicles: vandalism	33%
H - Two-wheeled vehicles	11%
I -Theft by breaking and entering	100%
J - Attempted theft by breaking and entering	14%
K - Theft (not pick pocketing) from the person of the interviewee	100%
L - Theft from the person of the interviewee without the latter's knowledge, until it was too late	43%
M - Sex crimes	0%
N - Assault/threats	80%
O - Fraud	13%

The figures show that there is a need for increased involvement of the administration to ensure that the populace is aware of actions they could take to prevent crime, and this includes the necessary police reporting when crimes actually take place. Indeed certain individuals have gone so far as claimed that they did not consider sexual molestation or indecent exposure a crime. The reason for this

assertion could be that they do not wish to create tension within the family as the perpetrator could be a relative. This could also be the case in instances of fraud and theft from the person of the victim (where the victim is initially unaware), both crimes which often go unreported.

In order to analyze why people do not report crime, it would be interesting to look into the reasoning behind such behaviour. These vary from a consideration that the crime is not serious enough, despite the law being broken, to the fact that there may not have been sufficient proof for the police to wrap a case. Some individuals have taken the law into their own hands and solved the case. In our study it was interesting to note that in this respect, according to this part of the questionnaire, people have a lot of faith in the local law enforcement

when it comes to theft and the way the police handle these cases. In fact, there have been few negative comments about the Dingli police in the questionnaire. Nonetheless, one must keep in mind that 61.9% of Dingli residents do not have a high opinion of police. At the same time, a third of interviewees (a significant portion) answered that the Dingli police perform good work.

### Areas where crimes are committed

Police reports about crimes committed in public places and business establishments are rarely reported, and this situation requires remedying. One of these places is the Housing Estate (several streets, but none that stands out where the crime rate is concerned). The people living in these zones may need to feel greater security – perhaps, with better street lighting, addressing the issue of theft from homes that are vacant during the day, looking at the business establishments that may attract criminals because of their success and thus more people and cars are targeted during peak times.

In several instances the *Ġnien il-Familja* is mentioned in the context of vandalism on cars and threats/assaults. It appears that this area requires stronger surveillance during specific hours when these crimes normally take place—namely when the gardens are visited by youths in search of a good time, mothers taking their babies for a stroll during the day, and during other activities normally held there. In this study, we have focused exclusively on crimes taking place in Dingli and its suburbs. Crimes that were reported as occurring in the surrounding fields were beyond the scope of this study.

### General points on Dingli

It seems that in Dingli there are more people who are ready to help each other than people who care only about themselves. In fact, Figure 4.7 shows that more than half of the interviewees (52.4%) made this claim. However, we admit that we thought that this figure would be bigger. It is a little troubling that more than a third of the interviewees (38%) believe that most of the people mind their own business. This can indicate that, as time goes by, the feeling of isolation is growing and the sense of community is not as strong.

Figure 4.8 indicates that, in Dingli, the absolute majority of the inhabitants (81.8%) feel safe walking alone when it gets dark. Although this figure is a positive one, 15% of the interviewees insisted that they do not feel safe walking alone after dark and this figure is not insignificant; so it is here shown how important it is that the streets/ areas are all lit up at night. Bar Chart Z3 strengthens this argument when it indicates that 13.3% never go walking alone in the dark in Dingli. But it is a positive sign that the majority (55.2%) do not feel the need to avoid certain streets/areas when they are walking alone in Dingli. Table Z4 indicates that of all the zones, the areas these people avoid most are the cliffs. There they feel less safe.

Figure 4.7: How do you describe Dingli in general?

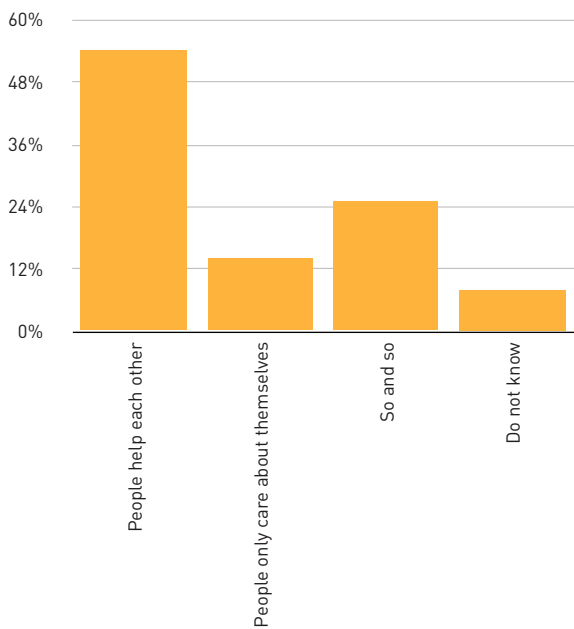
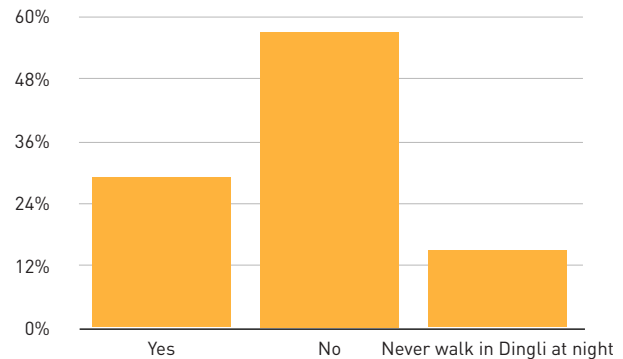


Figure 4.8: When you walk alone in Dingli, do you avoid certain streets or areas because of perceived danger, or do you just avoid certain people?

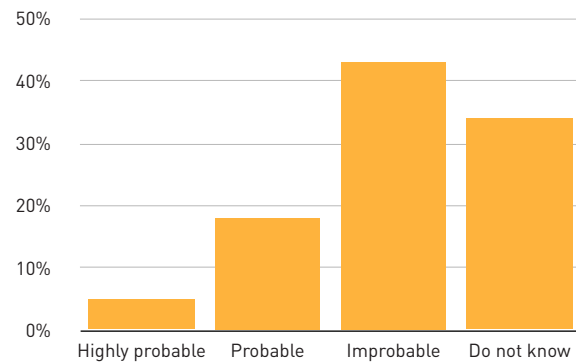


**Table 4.4: Can you tell me which streets/areas you avoid? (Write names of streets/areas)**

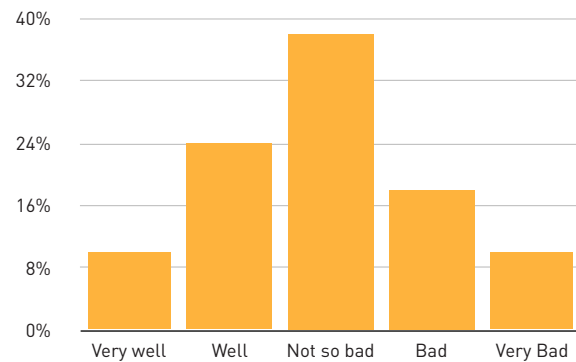
Place	Number
Around Dingli cliffs	56
Places where dogs are not kept on a leash	7
Around Buskett	5
The outskirts	5
Places and fields which are out of the way	4
Rabat road	4
The cemetery area	3
Where there is no light	2
Ross Street	2
Near the school	2
Certain lanes	2
Near the farms	1
Worker Garden	1
Jewish lane	1
Ta' Hofriet ir-rizz	1

Although Figure 4.9 indicates that many of the people (41%) feel safe in their own home, the fact that 23.4% of interviewees believe that there is a big chance that, during this year, somebody might break into their house (burglary) indicates that the feeling of safety is on the decrease. With these somewhat pessimistic individuals, one can include the 31.8% who expressed their doubts, so the percentage of pessimistic opinions rises to 55.2% - which indicates a substantial amount of people who do not enjoy peace of mind in their own home. This can be a case of the people's lack of faith in the police. In fact, 61.9% (the 26.6% who are convinced that the police are not effective and the 35.3% who think that the police are making a little difference on the positive plane - "not bad") of the residents do not have a high opinion of the police (figure 4.9). Yet, though it is necessary for the faith in the police to increase, we have to say that the third who answered that the Dingli police do their work well is not insignificant. On the same subject, little less than a quarter of the residents (23.3%) are convinced that the police never pass from their street. Maybe it is time that efforts are made in Dingli so that the confidence of the people in the forces of justice grows. If such is the case, perhaps the residents will be able to set their mind at rest and feel safe when they are in their own home.

**Figure 4.9: How great do you think is the probability (or possibility) that, during this year, somebody might break into your house (burglary)?**



**Figure 4.10: Do you think that the police in Dingli are doing their job well?**



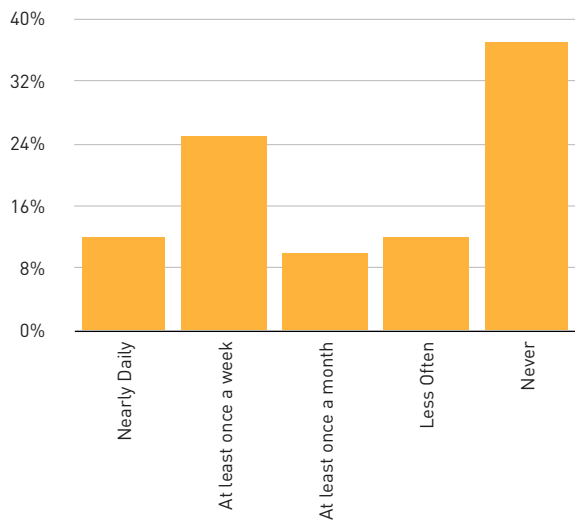
The majority of interviewees (36.4%) answered that they do not engage in this recreational activity (figure 4.11). Almost a fourth (24.8%) said that they go out once a week. Only 10.8% answered that they go out almost every day. Perhaps this percentage indicates the number of people who go out for the purpose of exercise. 10.1% said that they go out once a month, and 11.2% go out even less frequently. We were expecting to see that more than a fourth of Dingli residents (more than the 24.8% registered in this survey) would want to go out and have fun at least once a week - but we were mistaken. This is worrying when one considers that over one-third of the people of Dingli consider themselves isolated and alone. One cannot state that in Dingli no social activities take place...rather, the situation is quite the opposite. Therefore, the only explanation that comes to our mind is that perhaps the transplants from other towns across Malta have not yet integrated fully into the Dingli community. It is beneficial for the Local Council to be aware of this fact with respect to these particular residents.

The majority of Dingli residents enjoy peace of mind in their homes. In fact, 45% of the 76.6% that answered this question admitted that they do not have any protective system against break ins within their homes. This shows that protection against burglary is considered an unnecessary and useless expense. Nonetheless, a substantial number of interviewees preferred to omit answering this question. Perhaps they were afraid to make an open admission that they did not have protection, or did not want to disclose the type of system they owned. It appears that a third of Dingli residents have some form of protection against burglary installed in their homes. The most popular are: burglar alarms, special locks and dogs.



The majority of Dingli residents (53.5%) prefer to have someone check on their home when they are absent and of this percentage, 6.3% even go as far as to hire professional watchmen. Therefore, although more than a third of Dingli residents (38%) leave their home for a period, and have reassurance that they will come back to it without incident, they do worry that something may happen to their home while they are away.

**Figure 4.11: How often do you go out for fun (bar, club, youth centre, visiting friends, etc.)?**



As expected, the absolute majority of the people of Dingli (69.9%) do not own a firearm. However, although a quarter of Dingli's population owns one (25.5%), and this is worrisome, these weapons are used for hunting. In fact, one mostly finds hunting rifles in the homes of Dingli. Nonetheless, about three-fourths of interviewees chose to not answer this question. This could raise speculation that in Dingli homes one may find weapons that are not registered and therefore, are held without a permit. It could also be that the interviewees did not want to share the fact that they may own a weapon. However, this is a possibility that cannot be verified.

Many of Dingli's residents enjoy peace of mind in their own homes. In fact, the absolute majority (62.6%) of interviewees answered that they do not have home insurance to cover themselves against burglary. A little more than a fourth (26.9%) of interviewees answered that they did own home insurance to cover themselves in case of burglary.

It was not a big surprise to learn that three quarters (75.9%) of interviewees answered "Very much" to the question "How much do you enjoy living in Dingli?". It is clear that this is a positive response, although one may wish to look into why a fourth of residents appear to be indifferent or unhappy with living in Dingli.

We already discussed how it appears that over one-third (36.4%) of the people of Dingli do not go out to have fun; but that one definitely cannot say that in Dingli there are not enough social activities for the residents. Rather, it is quite the opposite. In fact, the majority (61.6%) of Dingli residents are convinced that the socio-cultural events that are organized in Dingli are very good and well put together. Only 2.1% of responses were negative. Therefore, perhaps these individuals (the one-third who state they never go out to have fun) came from other parts of Malta and have not yet integrated into the Dingli community. As we have stressed above, it would be beneficial if the Local Council

were made aware of this fact and of these individuals who, most probably, are feeling alone and isolated.

Dingli residents are happy with the garbage collection system in their neighbourhood. In fact, a significant (91.3%) of interviewees claimed that this service is very efficient – actually, 47.6% of these believe that the garbage collection service is "excellent". Only 1% of interviewees answered negatively and 5.6% answered "so and so".

Although over one-third of Dingli residents (37.7%) are convinced that the local healthcare services are good, a little less than a third (30.4%) believe that their local healthcare services are "so and so", while 16.7% have expressed a negative opinion about this subject and 16.4% had no opinion at all – maybe they were lucky enough to not need these services, therefore, they did not know how to respond honestly. We think that, all things considered, the people would like to have better medical services in the neighbourhood ... although in Dingli one finds a private clinic where several medical professionals practice, and another private clinic that offers the services of a female doctor. Nonetheless, it appears that people would like to receive better government-sponsored healthcare services, and that the existing ones are not perceived adequate.

A considerable percentage of Dingli residents (at least 42.3%) are pleased with the local transport system. About a third believe this system to be "so and so". However, about one in five Dingli residents (17.1%) believe that this service is inadequate. It is clear that this percentage of dissatisfied people should not be ignored and the reason for their opinion should be investigated. In addition, a remedy for the transport system's shortcomings, when these are identified, should be found.

Many of the people in Dingli enjoy peace of mind in their homes. In fact, 46.9% of Dingli residents appear to be content with the neighbourhood safety. A little more than a third (34.3%) claimed that neighbourhood safety is "so and so"; and only 11.2% expressed concern about the level of security in the area (figure 4.11).

When asked whether they believed there is a noise problem in Dingli, the absolute majority (78%) replied "no". However, 18.5% of interviewees believe that there is a noise problem in Dingli ... and it may be that these particular individuals live close to a club, bar or take-away. It may be of assistance to these residents if the source of the noise is investigated and efforts are made to make the neighbourhood aware of the inconvenience caused by such noisemaking. This way, the problem may be quelled or lessened.

Dingli residents are very concerned about reckless drivers and speeding. In fact, 61.9% of interviewees answered that Dingli has a problem with such drivers. It appears that a third of residents (32.9%) contradict this opinion. These latter interviewees may live in more isolated parts of the village. This concern of the people of Dingli should lead toward efforts to curb this abuse of the law. Perhaps the police may allow anonymous tipping whenever a reckless driver is spotted, and the latter may then be summoned to the police station and given a warning. Simply the fact of wasting an afternoon at the depot or police station may prompt them to exercise more care while driving in the future. Yet this solution may open doors to another kind of abuse: one may easily hide behind the cloak of anonymity and report another individual maliciously or because of a personal vendetta ... even if the person reported would not be engaged in the act of reckless driving.

As far as the question, "What improvements would you like to see in your neighbourhood?" is concerned, although it appears that the interviewees were pleased with the work performed by the Local Council, they nonetheless offered several suggestions (as shown in table 4.5) for (how they see) the improvement of quality of life in Dingli. The most prominent of these suggestions were: better roads, better police surveillance, better public transport and a better environment. Suggestions on the latter varied from the idea of more trees in the village to enforcing harsher punishments when people fail to keep their environment clean or disturb the neighbourhood with noise. One should note there that the majority of points made do not fall under the competence of Dingli's Local Council.

**Figure 4.11: What is your opinion of these services: neighbourhood safety?**



**Table 4.5: What improvements would you like to see in your neighbourhood?**

Improvements	Incidence
Improvements/cleaning/lights in the road	91
Enhancing the presence of police and police surveillance	60
Improvement of public transport	22
A better environment	20
More stringent traffic control	14
Cleaning of animal waste/ control of strays	13
Opening of the polyclinic	9
More business establishments/shops	8
More bank branches	7
More organized parking	5
More recreational areas for children	4
Increasing the area serviced by government with respect to the sewage system	3
Speeding up the completion of work to rehabilitate the football ground.	3
More recreational establishments for youth	3
Establishing a Dingli nursing home	2
Slow the process of building development and construction	2
Computer courses during school hours for adults	1
Gutters to ease flooding on roofs	1
More courses	1
A project to beautify the centre of Dingli	1
The Local Council responding more promptly to complaints	1
Neighbourhood watch	1

## Sustaining the Future: The Next Steps

Sustaining a community approach is normally high on the wish-list of close-knit communities and Dingli comes out as a very healthy structure with aspirations to enhance rather than restructure the state-of-affairs. This augurs well in terms of efforts to maintain social cohesion. Table 4.5 gives weight to such a state since security-related themes are only mentioned twice through police surveillance and neighbourhood watch albeit the former being mentioned by a considerable number of people, which is mainly due to the issue of Dingli serving as an attractor for thousands of locals and tourists and hence also serving as a potential attractor for offending opportunities. The rest deal with administrative, planning and welfare issues.

Cohesion is strong but as the village grows and attracts 'outsiders' to reside therein, the helping-factor would be reduced and in turn security and well-being. This is a trend found in areas that have experienced rapid growth and also those which are now seeing a generational change in the residential structure, particularly due to the growing number of elderly who opt for alternative accommodation and in turn serve as a fulcrum that attracts new buyers not necessarily from Dingli.

It is thus imperative that maintaining the current state of well-being requires a strategic and sustainable approach. This should include the fact that the current problems identified by the residents are taken into account and acted upon, whereby the sense of belonging is enhanced and the Local Council can then initiate activities that ride on such a crest, whereby sustainability measures are then docked in place.

It is interesting to note that reducing crime serves as one of the main impetuses to bring about activities for increasing social cohesion. Since most residents asked for an increase in Police presence, such an activity can help raise the community's safety factor, since presence reduces crimes through deterrence and can only work in conjunction with other initiatives where the successful perpetrators

are apprehended using other means such as remote sensor systems. The lack of such availability of services as is police presence should not doom the project since community-based initiatives can be carried out to compensate for such a short-coming. These services include community-public-private partnerships. As an example one can take into account a project that would establish a neighbourhood watch (by the residents) together with a visible public authority presence (such as the police, wardens, environment officers) and the private sector (through a CCTV, vehicle recognition system or other remote technology). The system can sustain itself since perpetrators are apprehended and the safety-status is increased, allowing more visitors to spend time in the village and surroundings armed with the knowledge that they can spend time without suffering an incident.

Sustaining crime-prevention strategies is not a straightforward activity, particularly due to its intrinsic reality: crime figures only show changes over a long period of time and crime in low-yield localities such as Dingli take longer to appear on the scale. Thus, the Local Council must ensure that the strategy contains a series of both short-term and long-term measures which ensure the following:

1. draft a realistic target-based deadline list that allows for publicity exercises on successes based on a phased approach
2. involve the community at every stage and ensure that those parts of the programme required from the residents is actually owned by the same residents and the community groups/entities
3. inform the community updated at every stage on the successes and lack of progress
4. ensure that government and all parties are aware of the required resources for future planning but also market the fact that the best resource for crime-reduction refers to the same residents

## Acknowledgements

Dr Jacqueline Azzopardi, Dr Saviour Formosa and Dr Sandra Scicluna would like to thank the full-time BA (Hons) in Criminology (2008-2011) students for conducting the interviews with the Dingli residents and inputting the data. It is thanks to them that this study was conducted professionally and economically. Thanks are also due to the Dingli residents for collaborating so much with the research team. This paper was translated from Maltese by Nathalie Gullaumier.





## Chapter 5

# Health and Wellbeing

Marianne Massa





## Rationale

The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, and political belief, economic or social condition. Health is a precondition for well-being and the quality of life, and all society should be engaged to empower individuals to live healthier, fulfilling lives. The World Health Organisation recognises the significance of creating health in places where people learn, live and play, and possibly one of the most crucial settings is the Community. A healthy locality or community is one that focuses on all its citizens providing conditions and opportunities that encourage, enable and support healthy lifestyles for people of all social groups and ages. It

is therefore inclusive, supportive, sensitive and responsive to all the diverse needs and expectations of the people living within it. A healthy locality offers a physical and built environment that encourages, enables and supports health, recreation and well-being, safety, social interaction, accessibility and mobility, a sense of pride and cultural identity and is responsive to the needs of all its citizens. Fortunately, the Mediterranean culture whereby there is a sense of family and community still prevails in Malta. However, there may be instances where this is being lost or somehow diminished. Once again, the local communities can counteract this trend and provide a sense of cohesion for its members resulting in better health.

## Current situation



Dingli Local council has for some time shown this commitment and was one of the first localities to show interest in working to promote

the health and wellbeing of its community. The Council has built a partnership with the Department of Health Promotion and Disease Prevention of the Ministry of Health in its endeavour to empower its citizens. A number of initiatives have resulted from the collaboration. It is envisaged that this partnership and goodwill achieved so far will flourish even further. The locality holds various strengths that can have a positive bearing on the health of its citizens. It is a rural area offering an unspoilt natural environment with availability of an abundance of fresh produce. The locality affords immense possibilities for walking varying from short easy strolls to more vigorous lengthier walks requiring more time and possibly energy. The extent of the population is another strength that should be exploited for the good of the community, making possible more targeted attention. The rural background of the community should facilitate a back to nature attitude and safeguard the locality from urban development and conserving the environment as a whole.

## Proposal for Action

The Council is being encouraged to maximise on these strengths in promoting and sustaining better health for its citizens. It needs to build on the good work and initiatives it has already started and sustain them as long as these initiatives are of benefit to its people. The Local Council needs to address new areas in health and health promotion according to the requirements of its local community. This can be achieved in a number of ways discussed here, including but not limited to:

- » assume its unique leadership role in securing the highest level of political commitment to strengthen and scale up efforts to improve and protect the health of its citizens
- » use its influence to advocate with all sectors to address health concerns in their policies
- » use public platforms to raise awareness about the root causes of ill health within its locality
- » champion healthy city principles, values and approaches in addressing these challenges
- » bring together and engage all relevant stakeholders in taking action for health

## From rhetoric to practice

The Department of Health Promotion and Disease Prevention has made a commitment to support and offer its expertise in helping the local council attain these goals. However, the onus of responsibility

lies with the Council in working towards bringing about the necessary changes for health. In attaining the actions outlined above, the Council will need to make its own commitment to achieving the desired

outcomes in the long term through a sustainable plan. The Council will need to continue to assume its role as a leader when it comes to issues of health. It can achieve this internally by sustaining health as one of the priority areas of the locality and continue to include health within its agenda. Moreover, the Council can serve as a leader in providing examples of good practice to other councils. Last year, the Council introduced a perfect example of good practice when it ran a Weight Management programme that can easily be transferred to other localities.

The Council is encouraged to advocate with relevant stakeholders the health impact that their actions might have on the locality and steer action towards health. Such action would be required if for example property developers were in any way impinging on the natural beauty of the locality and in turn that jeopardise the health of the community. The Council is encouraged to engage professionals in delivering talks and other awareness raising initiatives within the Community on Health. Health professionals heralding from within the Community should be sought as they would be knowledgeable of the local context of the issue. At the same time, the Health Promotion Unit is willing to provide expertise in the area. The introduction of structured guided walks within the locality has been sustained over a considerable timeframe and it is hoped that it will continue to be sustained and possibly strengthened.

Dingli Local Council is encouraged also to provide for the participation and empowerment of its citizens with regards health. This action is meant to ensure the individual and collective right of people to participate in decision-making that affects their health, health care and well-being. The Council would be providing access to

opportunities and skills development for its population, together with positive thinking to empower citizens to become self-sufficient. This can be achieved by providing opportunities for the citizens to put forward and discuss their health needs, suggestions and desires in a democratic forum made available for them. Working in partnership ensures that the building of effective multisectoral action will provide integrated approaches and achieve sustainable improvement in the health of the population. The Council should therefore work in partnership with relevant stakeholders as it is already doing with the Health Promotion Unit. It can do so with other public bodies, non-governmental organisations such as those working in Environmental issues as well as private businesses and industries. Farmers and farmers' co-operatives provide a perfect example of the latter within the community.

The underlying factor for health within the community to be sustained is to ensure sustainable development throughout the fabric of the community. Though in such a small island nation like Malta, no community is totally isolated from the whole, there exist certain determinants that will enhance or be detrimental to health. For the

Dingli community, this would mean:

- » safeguarding the environment at all cost
- » an adequate transport system
- » sustaining a socially just community that serves not only the present generation but also the future by investing in the young population of the locality

## The World Health Organisation Healthy Cities Initiative

The Department of Health Promotion and Disease Prevention is inviting Dingli Local Council to apply to join the WHO Healthy Cities initiative. The Healthy Cities initiative engages local governments in health development through a process of political commitment, institutional change, capacity building, partnership-based planning and innovative projects. It promotes comprehensive and systematic policy and planning with a special emphasis on health inequalities and urban poverty, the needs of vulnerable groups, participatory governance and the social, economic and environmental determinants of health. It also strives to include health considerations in economic, regeneration and urban development efforts.

The vision of the *Network of European National Healthy Cities Networks in Phase V (2009-2013)* is to support towns and cities across the WHO European Region in promoting health and health equity in all local policies and improving the health of the population living in towns and cities. The Department of Health Promotion and Disease Prevention envisage that Dingli Local Council is in a position to be the first Local Council from Malta to apply for accreditation into the

Healthy Cities initiative. This belief is based on the following criteria:

- » the achievement attained by the Local Council in health promotion initiatives to date
- » the fact that the initiatives have been sustained

- » the capacity shown in achieving planned activities
- » the entrepreneurship spirit of the Council towards further initiatives in Health Promotion

Dingli Local Council is therefore being encouraged to apply to become a member of the World Health Organisation's Healthy City Network. Phase V is the current programme and the timeframe covers 2009 to 2013. Applying for accreditation in the Network will mean initiating and sustaining efforts in Health not only over that period but also beyond.

Dingli is currently one of the healthiest villages in Malta to live in. Sustaining the status for years to come should be a priority not only for its local governance and the people living within it, but also for national government and the whole population. I augur that more towns and villages in Malta, irrespective of their location or extent, will strive to achieve a comparable health promoting lifestyle for their citizens.









## Chapter 6

# A Brief Study of the Air and Ground Water Quality in the Dingli Area

Emmanuel Sinagra





Sustainable environmental resource management is important for the quality of life of all societies. Two resources that are often mentioned in news items these days are air and water. It should be mentioned that concern about these two environmental resources has been shown for thousands of years. Greek and Roman civilisations encountered problems of air pollution due to the processing of metals which emitted noxious compounds into the air. Water pollution was also a problem for ancient Romans. This was more a matter of sanitation however, and more a problem of bacterial rather than chemical origin.

Industrial development and the widespread use of automotive vehicles for transport have made an enormous impact on the quality of air in modern communities, especially those in urban environments. Whilst problems of water sanitation in most modern societies like ours have been overcome, chemical pollution of water resources still remains somewhat of an issue.

One key to sustainable development is to identify the problems so one can deal with them. This report takes a preliminary look at the quality of air and water quality in the Dingli area with a view to an identification of some problem and thus a strategy can be developed.

## Air

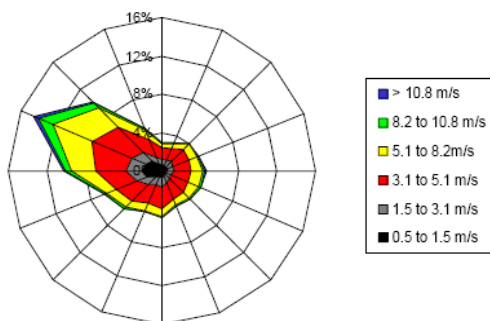
### Meteorology

When considering air quality, it is important to consider the meteorology and climate. Wind transports pollutants and therefore it is important to consider wind directions with respect to pollution sources. Rainfall will also influence air quality. For instance in dry conditions there is a higher likelihood of pollution from airborne particulate matter. The following is a summary of some important details of the climate of the Maltese islands.

#### Wind direction

Figure 1 shows wind frequency data for Luqa airport for the twenty-year period 1997-2001. Prevailing winds blow from the north-west sector with winds blowing between 290° and 340° occurring for 28.2% of the time. For the period under review calm conditions (wind speeds less than 0.5 m s<sup>-1</sup>) occur for approximately 3.7% of the time.

**Figure 6.1: Wind Rose For Luqa For The Period 1997 To 2001**



(a) Data from the Meteorological Office Luqa.

Looking at the wind rose with a map of Malta and a map of Malta (Figure 2), it is not difficult to see that Dingli is fortunate, that the major industrial areas and conurbations of the island of Malta are not downwind from the prevailing wind direction. Even nearby quarries, a source of pollution from particulate matter, are in areas from where the frequency of winds is low.

**Figure 6.2: A Satellite Image Of The Island Of Malta**



### Other Climate Data

Additional climate data, pertaining to rainfall and temperature, were obtained for the Maltese Islands. These data were recorded by the Water Works Department and Luqa Meteorological Office. Figure 3 shows average monthly rainfall and temperatures.

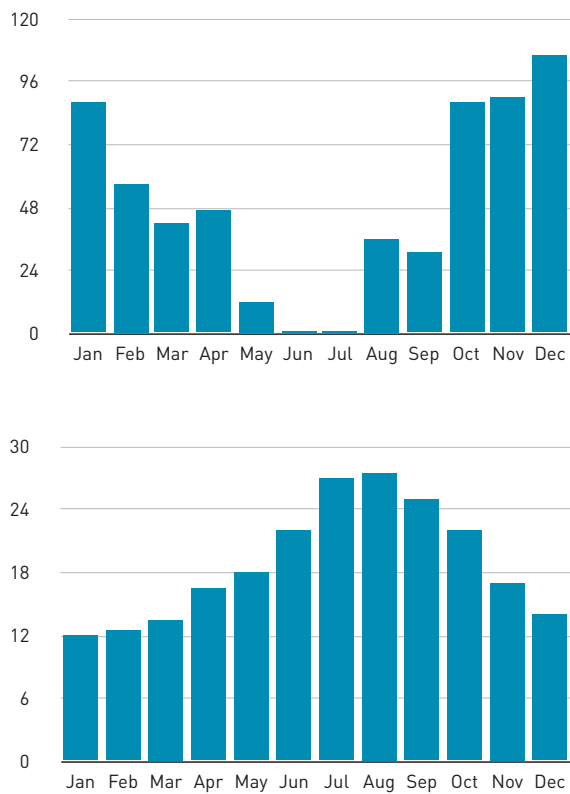
The majority of rainfall in the Maltese Islands occurs during the winter months between October and March with some 85% of the total annual rainfall occurring during this six-month period with December being the wettest month. The driest month is July with drought conditions being recorded 86% of the time over the observation period (1954 – 1986). The annual average rainfall is 530 mm, however over the period during which the data under examination has been gathered, the annual average rainfall has ranged from 191 mm to 1031 mm. The rainfall levels shown in Figure 3 are averages across all of the Maltese Islands. However, rainfall does vary across the islands, with a larger volume of rain falling in central Malta compared with the periphery.

The average monthly air temperatures recorded for the Maltese Islands vary from 12.3°C to 26.3°C, the coldest months being January and February, whilst the hottest months are July and August. One can observe a greater degree of variability of the temperatures in the Maltese Islands when one considers maximum and minimum temperatures. For instance, the average monthly temperature for

August is 26.3°C, however, the average daily maximum is 30.6°C. Similarly, the average monthly temperature for January is 12.3°C, but the average daily minimum for the month is 9.2°C.

The average monthly air temperatures recorded for the Maltese Islands vary from 12.3°C to 26.3°C, the coldest months being January and February, whilst the hottest months are July and August. One can observe a greater degree of variability of the temperatures in the Maltese Islands when one considers maximum and minimum temperatures. For instance, the average monthly temperature for August is 26.3°C, however, the average daily maximum is 30.6°C. Similarly, the average monthly temperature for January is 12.3°C, but the average daily minimum for the month is 9.2°C.

**Figure 6.3: Average Monthly Rainfall<sup>(A)</sup> And Temperature<sup>(B)</sup> For The Maltese Islands**



Rainfall figures based on data obtained from the Water Works Department (1854 – 1950) and the Luqa Meteorological Office (1951 – 1986).

Temperatures based on the data from the Luqa Meteorological Office (1951 – 1986).

## Pollutants of Concern

### Sulphur Dioxide, SO<sub>2</sub>

This is a compound which has a number of sources which can be natural or man-made such as the burning of sulphur-containing fossil fuels. High concentrations of SO<sub>2</sub> can result in breathing problems with asthmatic children and adults who are active outdoors. Short-term exposure has been linked to wheezing, chest tightness and shortness of breath.

Sulphur dioxide and nitrogen oxides are the major precursors of acid rain, which has acidified soils, lakes and streams, accelerated corrosion of buildings and monuments, and reduced visibility. Sulphur dioxide also has an effect on vegetation and crops and this has been taken care of in the European Union's Air Quality Standards.

### Nitrogen Dioxide, NO<sub>2</sub>

Nitrogen oxides are also associated with combustion; however, nitrogen is not present in most fuels burnt. In fact it is nitrogen from the atmosphere that reacts with oxygen at high temperatures such as those in combustion. Like sulphur dioxide, NO<sub>2</sub> is an acidic oxide and can result in breathing difficulties and a precursor to acid rain. It can also have an adverse effect on vegetation.

### Benzene

Benzene is a product of combustion and can also be found in large concentrations in cigarette smoke. This volatile organic compound is also released into the atmosphere from evaporation of petrol. In Malta, as in the rest of the EU petrol contains benzene at a concentration of 1% by volume.

In terms of health, benzene is considered as a carcinogen (cancer causing) and this is why a very low limit of 5 µg m<sup>-3</sup> has been set for its annualised average air concentration.

### Carbon Monoxide, CO

Carbon monoxide is a colourless odourless gas which is toxic. It is the product of incomplete combustion and can build up in enclosed areas when released from combustion sources such as gas fires, gas burners and smoking. Some problems also arise in areas with a high traffic density where cars spend a great deal of time in traffic queues in roads which are between high buildings.

At low concentrations, CO can cause fatigue in healthy people and chest pain in people with heart disease. At moderate concentrations, angina, impaired vision, and reduced brain function may result. At higher concentrations, CO exposure can be fatal.

### Ozone, O<sub>3</sub>

While ozone in the upper atmosphere shields us from ultraviolet radiation, in the lower atmosphere this irritating, reactive chemical damages forests and crops; destroys nylon, rubber, and other materials; and injures or destroys living tissue. It is a particular threat to people who exercise outdoors or who already have respiratory problems.

Ozone is known as a secondary pollutant since it actually forms from other pollutants, nitrogen oxides and therefore the highest levels of this pollutant are actually seen away from the source.

### Particulate Matter, PM<sub>10</sub>

This refers to particulate matter equal to or smaller than 10 micrometres in diameter. This size matter can reach deep into lungs. The composition of particulate matter depends on the source. Incomplete combustion leads to particulate matter composed of polyaromatic hydrocarbons. These are present in the sooty materials seen in smoke and often seen being emitted from the exhaust pipes

of diesel powered vehicles. Particulate matter originating from local stone dressing will be composed of limestone. Sea spray can lead to particulate matter and in this case this will be composed largely of sodium chloride (common salt). In Malta it is possible to get a large concentration of airborne Saharan dust. This will have a different composition to local dust and this difference in composition is useful in identifying particulate matter from this from the Sahara.

## Air Quality Standards

The European Union has set a number of Air Quality Standards (AQS) for the protection of human health and also importantly for an agricultural community like Dingli, there are limits set for the protection of vegetation. These AQS are listed in EU Directive 2008/50/EC. The limits pertaining to Human Health are listed in Table 1 and those relating to the protection of vegetation are listed in Table 2.

**Table 6.1: Air Quality Standards For The Protection Of Human Health**

Pollutant		Air Quality Standard
SO <sub>2</sub>	Limit Value*	125 µg m <sup>-3</sup> (24-hr average) This is not to be exceeded 3 times annually.
	Alert Threshold**	350 µg m <sup>-3</sup> (1-hour average over 3 consecutive hours) This is not to be exceeded 24 times annually.
NO <sub>2</sub>	Alert Threshold	200 µg m <sup>-3</sup> (1-hour average over 3 consecutive hours) This is not to be exceeded 24 times annually.
	Limit Value	40 µg m <sup>-3</sup>
O <sub>3</sub>	Limit Value	120 µg m <sup>-3</sup> (8-hour average)
CO	Limit Value	10 mg m <sup>-3</sup> (8-hour average)
Benzene	Limit Value	1.5 ppb (Annual Mean)
PM <sub>10</sub>	Limit Value	50 µg m <sup>-3</sup> (24-hour average) This is not to be exceeded 3 times annually.
	Limit Value	40 µg m <sup>-3</sup> (Annual Mean)

Adopted from EU Directive 2008/50/EC

**Table 6.2: Air Quality Standards For The Protection Of Vegetation**

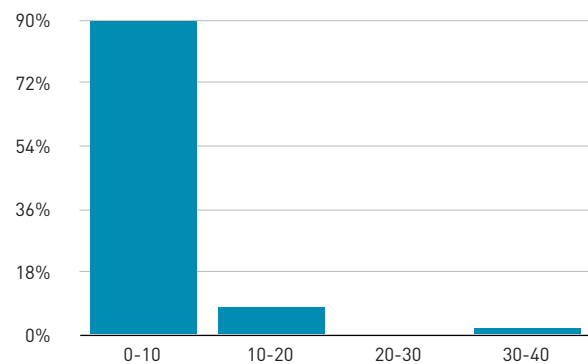
Pollutant		Air Quality Standard
SO <sub>2</sub>	Limit Value	120 µg m <sup>-3</sup> (8-hour average)
NO <sub>2</sub>	Limit Value	10 mg m <sup>-3</sup> (8-hour average)
O <sub>3</sub>	Limit Value	1.5 ppb (Annual Mean)

Adopted from EU Directive 2008/50/EC

## Concentration of SO<sub>2</sub>

MEPA measures SO<sub>2</sub> concentrations in Dingli using diffusion tubes. Diffusion tubes collect the pollutant over the period of 3-4 weeks and therefore this method gives monthly averages. Figure 3 shows the distribution of measured SO<sub>2</sub> concentrations in Dingli made by MEPA over the period March 2004 to March 2009.

**Figure 6.3 : Distribution Of Measured So<sub>2</sub> Concentrations In Dingli (March 2004 to March 2009)**



Data obtained from MEPA website <http://www.mepa.org.mt/air-diffusiontubes> as access March 2010.

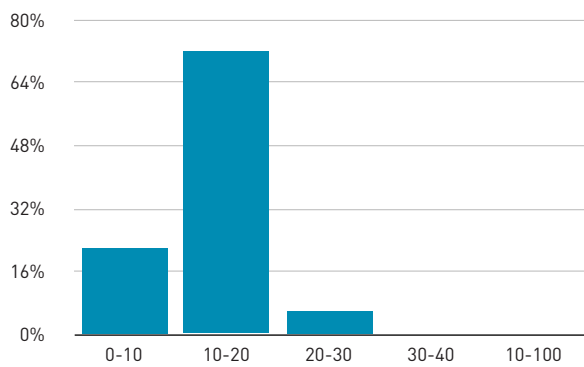
The data indicates that the average concentration of SO<sub>2</sub> is low. This is easily understood when one considers that the major sources of this pollutant are the power stations and that these are a fair distance away from the locality and are upwind from the prevalent wind direction of the Maltese Islands.

It is difficult to compare values from diffusion tube data to the limit values for the protection of human health since these are monthly averages whilst the limit values are set as hourly and daily averages. However, one can estimate a worst case average (taking each measurement as the top of the range) as 11.3 µg m<sup>-3</sup>. Looking at the data and given the location of Dingli one can say that it is unlikely that the hourly and daily limits are exceeded. The average indicates that the SO<sub>2</sub> limit for the protection of vegetation is not exceeded either, which is important for a community that has a number of people that rely on agriculture for their living.

### Concentration of NO<sub>2</sub>

As in the case of SO<sub>2</sub>, the major sources of this pollutant (power stations and traffic) are upwind from the prevalent wind direction and also distant from Dingli. Traffic around Dingli is also low. Once again MEPA measures NO<sub>2</sub> concentration using diffusion tubes. The data for the period March 2004 and March 2009 is shown in Figure 4.

**Figure 6.4: Distribution Of Measured NO<sub>2</sub> Concentrations In Dingli (March 2004 To March 2009)**



Data obtained from MEPA website <http://www.mepa.org.mt/air-diffusiontubes> as access March 2010.

The MEPA data suggest a worst case average over the period of study of 18.5 µg m<sup>-3</sup>. With the distribution of measurements as they are, one can see that there was never been a breach of the annual limit of 40 µg m<sup>-3</sup> for this pollutant in the period of study.

Once again, it is difficult to relate the data from diffusion tubes to the hourly limit in Directive 2008/50/EC. However, one can say that, given the location of Dingli and the low traffic, it is unlikely that NO<sub>2</sub> pollution would exceed the Alert threshold of 200 µg m<sup>-3</sup> and it is even more unlikely that there would be more than the tolerated number of occasions in one year that this limit would be exceeded.

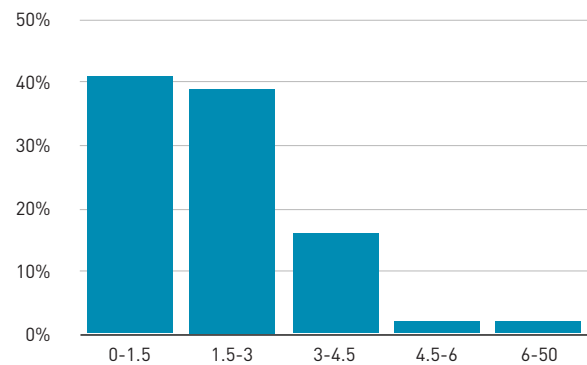
In as far as the limit value for the protection of vegetation is concerned; the data suggests that there were no breaches of the limit value of 30 µg m<sup>-3</sup> set for the protection of vegetation over the period of study.

### Benzene

The distribution of the ranges of measurements from diffusion tube analysis for benzene is given in Figure 5.

The data for benzene is another bill of health for Dingli. One can directly relate the data to the limit value of 5 µg m<sup>-3</sup> as this is an annual average limit. A worst case average concentration for benzene in the locality is likely to be less than 3 µg m<sup>-3</sup> over the period of study. By inspection of the monthly MEPA data from the organisation's website, it can also be said that there was never a period, where the annual average concentration of benzene in Dingli has exceeded the limit value.

**Figure 6.5: Distribution Of Measured Benzene Concentrations In Dingli (March 2004 To March 2009)**



Data obtained from MEPA website <http://www.mepa.org.mt/air-diffusiontubes> as access March 2010.

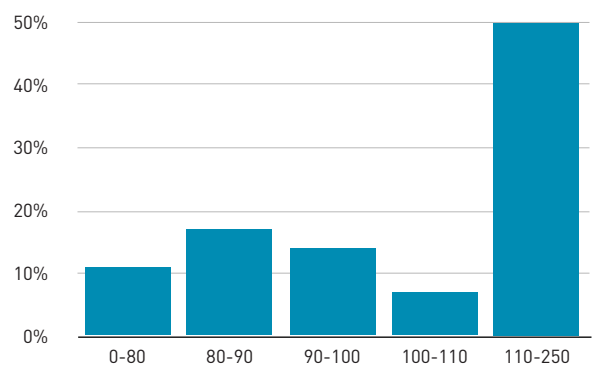
It should be stated that with vehicular traffic being a major source of this pollutant, the average concentration of benzene is likely to be lower in hamlets around Dingli than in the village.

### Ozone, O<sub>3</sub>

The distribution of the ranges of measurements from diffusion tube analysis for benzene is given in Figure 6.

The data clearly shows high concentrations and a worst case average for this pollutant is greater than 110 µg m<sup>-3</sup>. It is very difficult to compare these values with limit values for the protection of human health since the diffusion tube data are monthly averages whilst the limit value is an eight hour average.

**Figure 6.6: Distribution Of Measured O<sub>3</sub> Concentrations In Dingli (March 2004 To March 2009)**



Data obtained from MEPA website <http://www.mepa.org.mt/air-diffusiontubes> as access March 2010.



The monitoring of this pollutant by MEPA using diffusion tubes is really only intended for indicative purposes only and the indications are that it is high around the Maltese Islands in general. It is proposed by Saliba et al<sup>1</sup> that there is a high degree of transboundary pollution. That is, it is 'imported' from Europe. This means that there is little that one can do in Dingli to suppress this pollutant.

### Particulate Matter PM<sub>10</sub>

This pollutant is not monitored in Dingli. One cannot measure the concentration of particulate matter by diffusion tubes. Concentrations of PM<sub>10</sub> are generally high in Malta and there has been daily values recorded in excess of the allowed annual exceedences of the pollutant around the islands. Dingli should not be an exception to the possibility of exceedences. Despite being far from power and major traffic sources, Dingli is surrounded by fields and on windy dry summer days, dust entrainment can lead to airborne PM<sub>10</sub>. However, it should be noted that high PM<sub>10</sub> concentrations in Maltese air can be attributed to a large degree from transboundary pollution.

In the case of PM<sub>10</sub> abatement measures can be taken in the locality. There are a number of construction projects in Dingli with old houses being replaced by newer ones. The whole process, often including digging and rock cutting, produces copious amounts of dust. The biggest problems arise from on the spot stone dressing and also sanding down of facades. These activities produce PM<sub>10</sub>. Mitigation measures are seldom seen to be applied. Stones or bricks should be wet whilst dressing and when sanding a facade, there should be a covering to prevent serious pollution episodes.

### Carbon Monoxide, CO

Carbon monoxide is not monitored by MEPA in Dingli. Carbon monoxide is associated mainly with the transport sector and in fact the Emission Inventory for Malta (1997) suggests that 97% of its production is associated with this sector. The small traffic volume in Dingli would imply that the concentrations of carbon monoxide in the air in Dingli are low.

### Conclusions

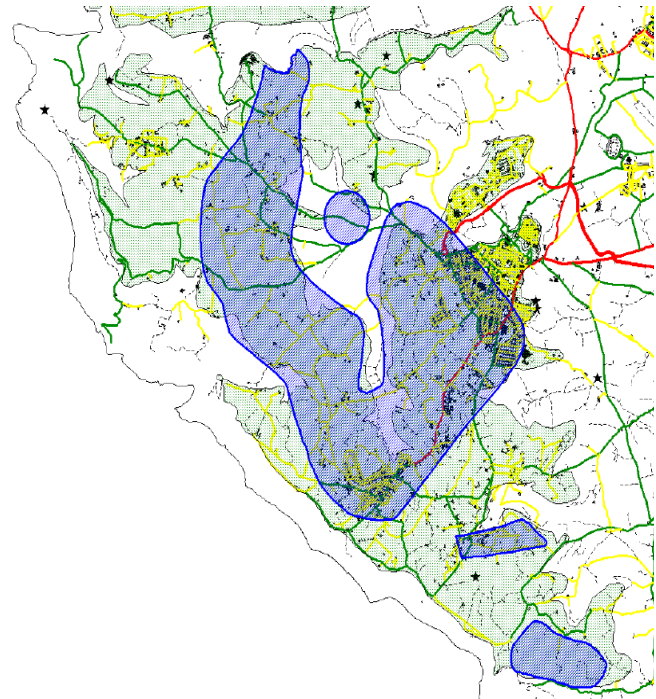
In general Dingli has little problems with pollution. This is largely due to its distance from power sources and heavy traffic areas. Ozone concentration in Dingli air is high but it is likely that this is due to transboundary pollution. Airborne particulate matter is likely to be high once again through transboundary pollution however; local generation can be suppressed with some simple mitigation measures.

### Ground water

Rainwater in the Dingli and Rabat areas can percolate to the perched aquifer which is the top aquifer seen in Figure 7.

Much of the land around Dingli and Rabat are in a water safeguard zone. This is seen as the blue shaded area in Figure 8.

**Figure 6.7: Water Safeguard Zone In The Dingli, Rabat And Siggiewi Region**



Obtained from <http://planetearth.nerc.ac.uk/features/story.aspx?id=320> as accessed March 2010

With the implementation of the Nitrates Directive (91/676/EEC), protection of ground water from nitrates. This directive calls for measures to cover areas where manure is stored or can gather in order that rainwater laden with nitrate forming compounds cannot percolate to the groundwater. The EU limit for nitrates in groundwater is 50 milligrams per litre (mg L<sup>-1</sup>). A survey for nitrates from a series of boreholes in the Dingli and Rabat area was undertaken with analysis performed at the Department of Chemistry at the University of Malta. The average concentration of nitrates in the perched aquifer was found to be 68 mg L<sup>-1</sup>. There was only one value which was below the EU limit. It is clear that this water needs protection. The enforcement of the Directive and judicious use of nitrogenous fertilisers should mitigate this.

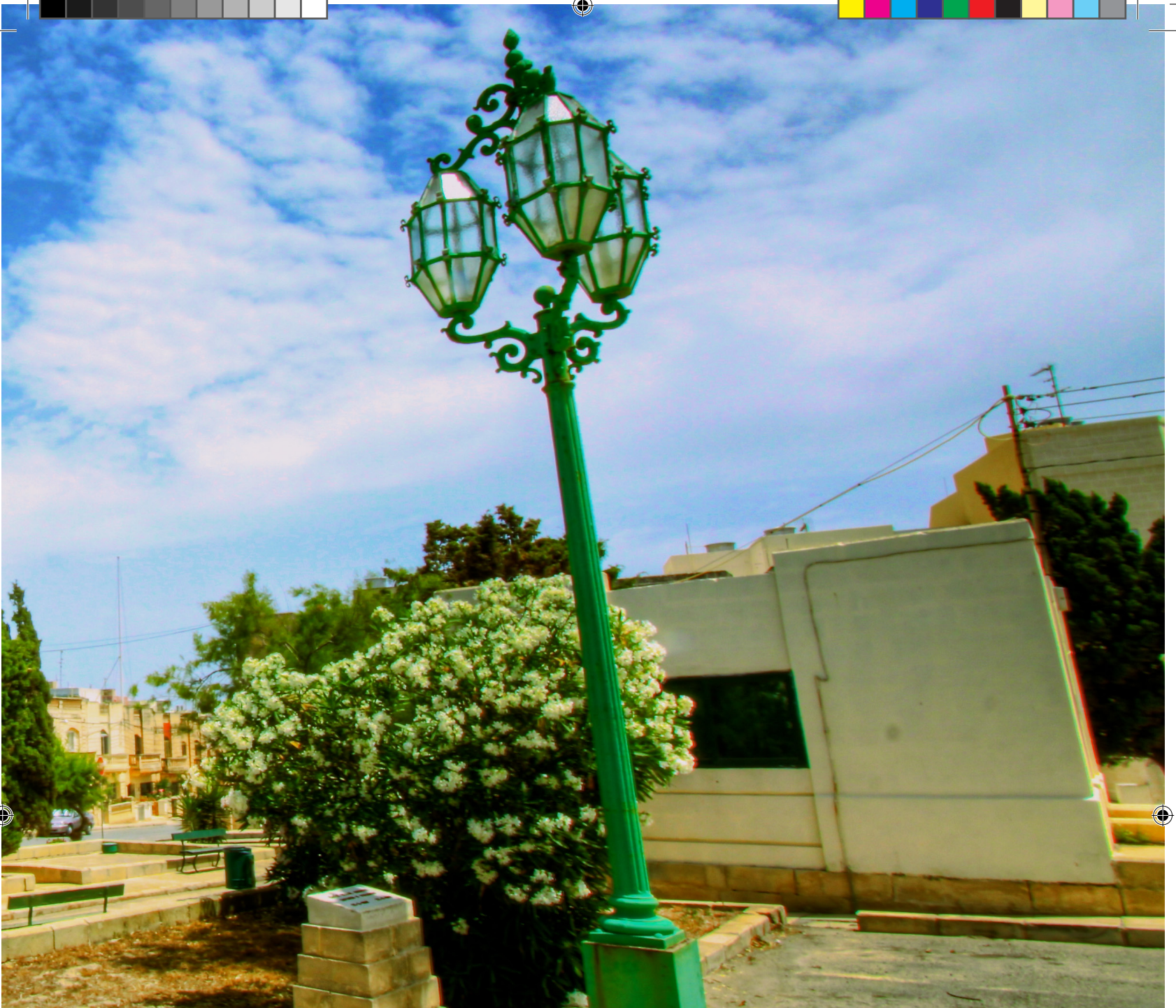
Samples of water from the lower aquifer and from a higher ground stream were found to contain much lower levels of nitrates. In fact these gave values of the order of 5 mg L<sup>-1</sup>.

### Conclusions

Water in the lower aquifer and that from high level streams contain nitrates well below the EU limit of 50 mg L<sup>-1</sup>. However, the perched aquifer seems to contain levels of nitrates well above the limit. Enforcement of the Nitrates Directive is recommended.

<sup>1</sup> A nine year study of background surface ozone concentrations on the island of Gozo in the Central Mediterranean. M. Saliba, R. Ellul, H Güsten, L. Camilleri. Proceedings of IGAC/ CACGP/ WMO meeting held in Cape Town, South Africa 17th-22nd September 2006.





**Chapter 7**

# **A Review of Land Use Policies and Recommendations for Improvement**

David Mifsud Parker, mc<sup>2</sup> architects







## Introduction

One of the major aspects in sustainable utilization of resources is the use of land, which for a small island state is limited and therefore much in demand both by humans and natural systems alike. Land use planning plays an important role in determining the fate of land and therefore a sound planning system would inadvertently guarantee appropriate land parcelling, provided laws, regulations and policies are adequately applied.

Although the local planning system is guided through a number of Plans, such as the Structure Plan and North West Local Plan (for Dingli and a number of neighbouring towns) [NWLP], Policies at lower levels, such as the Planning and Design Guidance on Agriculture,

Farm Diversification and Stables (MEPA, 2007), the EU Environmental Acquis also influence the strategic land use plans and planning consent decisions. Foremost of the EU Legislative instruments are the Habitats, and Wild Birds Directives (Directive 92/43/EEC and 79/409/EEC respectively, transposed through Legal Notice 311 of 2006) which have resulted in the designation of Natura 2000 sites with all the applicable opportunities and restrictions.

This brief document reviews the Local Plan policies for the Dingli area and identifies action points to further safeguard and promote Dingli's natural and human characteristics.

## What does Dingli have to Offer?

As a starting point to the discussion, the positive and negative attributes of Dingli are identified through a quick SWOT (Strengths, Weaknesses, Opportunities, Threats) Analysis in order to set the scene for the proposals being put forward. The analysis briefly described in Table 1.1 notes a number of positive and less positive indicators of Dingli's features. It is clear for example that readily available natural features such as landscape and visual amenity are a main attraction to the local and visiting population, whereas a number of risks may diminish the uniqueness and value of the locality. The uniqueness of the locality lies in the readily accessible unspoilt rural/ natural countryside, which are strong magnets for tourists and prospective settlers, which unless properly managed may inadvertently attract a number of problems. In summary Table 1 identifies the following action points/needs:

1. Improved infrastructure/amenities including linkages with other towns such as Siggiewi;
2. Limitation and control of nuisance activities;

3. Strict restriction of urban-type uses within built areas, and sensitive planning within this zone;
4. Promotion to and management of foreign and local tourists;
5. Continuation of agricultural, including traditional, practices.

Whereas it is acknowledged that a number of these action points are intrinsically linked to the planning process, thus the scope of this document, one cannot but stress that a number of impacts result from the entire life cycle of a development or service. In such cases where implementation/ control falls beyond the remit of the local planning system, the jurisdiction of other authorities on occupational health, public health, tourism and resources to mention a few may well apply. In some cases whereas it is up to the Local Council or entities which it might appoint to ensure that the town's quality remains at the top-notch, it is certainly the responsibility of each one of the residents and users of the area to ensure that a better quality site is left, something which the Maltese culture still has to adopt.

**Table 7.1: Results of SWOT analysis.**

	Strengths	Weaknesses	Opportunities	Threats
Urban/ Social	<ul style="list-style-type: none"> <li>» Good sources of daily amenities</li> <li>» 'Remoteness'</li> <li>» Low background noise</li> <li>» Good quality roads within town</li> <li>» Formal recreational areas common</li> </ul>	<ul style="list-style-type: none"> <li>» Provision of infrastructure (water, electricity)</li> <li>» 'Remoteness'</li> <li>» Quality of roads outside town centre</li> </ul>	<ul style="list-style-type: none"> <li>» Stabilizing infrastructure</li> <li>» Upgrading links with neighbouring towns e.g. Siggiewi (thru' existing roads)</li> <li>» Improved promotion of schemes for reduction/ sensible use of electricity and water use and waste management schemes</li> </ul>	<ul style="list-style-type: none"> <li>» Dependence on other towns for main amenities</li> <li>» Increase in residents beyond infrastructural carrying capacity</li> </ul>
Rural	<ul style="list-style-type: none"> <li>» Good percentage of arable and quality agricultural holdings</li> </ul>	<ul style="list-style-type: none"> <li>» Uptake of land for urban-type development</li> <li>» Increased trampling of land by tourists</li> <li>» Decrease in water quality through runoff/ malpractice</li> </ul>	<ul style="list-style-type: none"> <li>» Traditional agricultural practices</li> <li>» Increase awareness of local and EU Regulation</li> <li>» Use of wind energy to power activities/ holdings</li> </ul>	<ul style="list-style-type: none"> <li>» Abandonment of agricultural land or conversion into structures for intensive agriculture e.g. farms</li> <li>» Uptake of land for urban-type development</li> <li>» Further expansion of development zone on agricultural land</li> </ul>
Natural/ Cultural	<ul style="list-style-type: none"> <li>» Relatively intact landscape</li> <li>» Relatively unspoilt ecological and geological features</li> <li>» Good quality air</li> <li>» Good spread of features of cultural importance</li> </ul>	<ul style="list-style-type: none"> <li>» Urban-type development reduces landscape and ecological value</li> <li>» Urban-associated impacts e.g. light and discharges</li> <li>» Wastelands occupied by former industrial activities/ overspills</li> <li>» Cultural features within the enclave of private land</li> <li>» Lack of visitor management</li> <li>» Dust (quarry operation)</li> <li>» Water quality deterioration</li> </ul>	<ul style="list-style-type: none"> <li>» Restricting development in areas outside scheme</li> <li>» Promotion of particular natural/ heritage trails with variety of features</li> <li>» Manned/ unmanned hubs for visitor management including public amenities</li> <li>» Improved operation of obnoxious activities through implementation of environmental standards</li> <li>» Improved water retention systems and treatment of runoff</li> </ul>	<ul style="list-style-type: none"> <li>» Increase in visitors beyond carrying capacity</li> <li>» Lack of control of visitors operations</li> <li>» Deterioration of rural/ cultural structures incl. rubble walls</li> <li>» Conversion of former structures for hazardous/ industrial uses</li> <li>» Further expansion of development zone on natural land e.g. ix-Xaghra l-Kbira</li> </ul>

## Analysis of Present Policies in the NWLP

The NWLP identifies the following Policies related to Dingli, either as part of the General Policies for the region (Section One) or the Area-Specific Policies (Section Two). It is clear that the NWLP and other planning tools, chief amongst them the Planning and Design Guidance on Agriculture, Farm Diversification and Stables (MEPA 2007), together with designations as AEI'S, AHLV's and Natura 2000 sites, offer an adequate amount of protection to the landscape, agriculture and natural areas of the North West leaving no stone unturned in restricting urban uses within their appropriate zone. However, it is acknowledge that there are loopholes in the system of control. To mention one, for example, we can refer to Policy 4.3B : Stables of the Planning and Design Guidance on Agriculture, Farm Diversification and Stables (MEPA 2007) and the Planning Guidance Swimming Pools Outside Development Zones (2000).

Although policies generally offer adequate high level protection of rural and natural areas from urban type uses and other miscellaneous disturbances such as land reclamation, a number of developments which are increasingly found outside the development zone as classified below:

1. Developments constructed prior to establishment of planning policies: Whereas it is understood that these are located in areas established for that particular use through the former (or lack of) planning system, it is evident that relentless attempts for their expansion to cater for today's standards such as swimming pools are being sought;
2. Recent proposals which have been granted approval. These are often located in an area where older structures such as disused farmhouses or military structures were known. Although in the case of stables they may be located in other areas not currently developed. Residential or intensive agricultural uses are clearly out of context in view of changing standards of living which require further uptake of land;
3. Illegal interventions such as agricultural rooms, land reclamation exercises, etc. Unlike the above, these are clear cases of instructing locals on the importance of following established policies and good old policing to detect breaches.

## General Policies

The following is a summary of policies which directly or indirectly affect:

- » *Local Plan Strategy Map (Map 2)*: identifies rural settlements, areas of recreation, major areas of recreation (Buskett), Areas of Agricultural Value (AAV), Country parkways, road network and Area of High Landscape and Conservation Value (AHLV);
- » *Policy NWAG 1 For Protection of Agricultural Land*: only buildings, structures and uses essential to the needs of agriculture will be permitted if they do not negatively affect the surrounding agricultural and natural features;
- » *Hard Stone Quarries Maps 5- 8*: Although no active quarries are present within Dingli, some e.g. Ta' Żuta are relatively close. All quarries within the area shall be restored to agricultural use following excavation of mineral resources;
- » *Buskett Major Recreation Area*;
- » *Policy NWRE 5* encourages establishment of a network of country parkways, coastal and inland rights of way for footpaths, cycle routes and horse riding trails, in which public right of access will be safeguarded. The adjoining map identifies the relevant footpaths and parking areas;

- » *The General Transport Strategy* identifies the need for strategic road network improvements and road calming measures through the centre of Dingli, and identifies areas of junction improvements which lead to Dingli;
- » *Protected areas* through scheduling as a Level 1-Level 3 Area of Ecological Importance, Natura 2000 sites (both SAC's and SPA's), Woodland remnants (NWC0 10), Garrigue (NWC0 13), AHLV and IUCN Protected Landscapes and water Protection Areas including springs (NWC0 13).

## Area-Specific Policies

Section Two of the NWLP mentions Dingli when addressing the importance of Rabat as a commercial hub and in two policies strictly applied to the locality relate to recreational facilities and the school extension, through policies NWDG 1 and NWDG 2 respectively. The Local Plan has designated a Local Centre and a Residential Area in Dingli. The boundaries of these land designations are shown on Map 68 and are covered by General Policies NWCM 2 (Local Centre), and NWUS 3 (Residential Area), which relate to the zones as a whole. In support of these land designations the Local Plan seeks to manage traffic through General Policy NWTR 3.

## Recommendations

Recalling the above action points, the following are of relevance to planning policy and may be reflected in amendments to the NWLP. The following are suggestions for inclusion in the document:

### **NWDG 3: Establishment of country walkway and nodes (further to Policy NWRE 5 )**

The appropriate Agencies with the help of the MEPA will seek to establish a managed network of pathways, identified in Map 1, which includes circular routes, through currently existing carriageways for rambling and cycling. This network shall include strategic nodes located within the confines of existing carriageways, at particular points along the route, in order to direct users and to act as resting areas. Only One such node shall provide necessary public amenities, whereas another node may be used for small scale day-time events such as agricultural fairs. Within these nodes, no activity shall take place unless it is shown that it doesn't affect the surrounding ecological and agricultural resources.

The agency under whose care the pathways shall fall shall design a long term management plan for the pathways, in collaboration with the Environment Protection Directorate and other Competent Authorities, which shall include measures to improve the baseline situation through:

1. restoration of cultural heritage features including rubble walls and corbelled huts (giren);
2. in collaboration with relevant agencies control and/or halt activities as necessary causing a risk to the natural and cultural features including landscape;
3. restoration of degraded natural and agricultural areas;
4. safeguard of public access to the designated pathways at all times;
5. control of parking including removal of parking on garrigue.

Appropriate low volume informal parking and bicycle parking bays shall be established along the main carriage ways of the route not on the cliff side.

### **NWDG 4: Promotion of Traditional Agricultural Practices**

The appropriate Agencies will establish a centre for promotion of and selling of local agricultural traditional practices and associated

products. This centre may be located in one of the nodes associated with the country walkways and within a currently disused building, provided that it is shown that it will not have an effect on the immediate and larger natural and agricultural value of the site.

### **NWDG 5: Safeguarding of Landscape Value and Visual Amenity**

In determining proposals for development consent the Competent Authority shall consider the impact of Landscape Value and Visual amenity as an overriding interest within the Zone of Visual Influence of the AHLV. Proposals shall not be granted unless it is shown that they will not have a direct, cumulative or consequential impact on the Landscape.

### **NWDG 6: Restriction of Urban type uses outside scheme**

Currently existing farmhouses or similar structures used for agricultural purposes shall not be converted for residential or any other type of urban type uses but shall continue to serve existing agricultural practices.

### **NWDG 7: Improvement of infrastructure and Amenities**

The relevant Agencies shall seek to improve the currently existing infrastructure through:

1. improved access of local roads to Siggiewi, without the need for road widening;
2. improved supply and storage of potable water.

Further to these policies we are mindful of interventions which the Competent Authority may from time to time receive including further expansion of the development zone and planning control applications to determine the characteristics of areas recently included in the rationalisation exercise. Proposals for expansion of the development zone should be discarded a needs assessment in order to determine the local and national requirement is submitted and in such a case should by no means be made at the expense of any natural or agricultural areas, particularly garrigue. In addition, planning control proposals should respect the surrounding residential characteristics, including height, and should be adequately blended through landscaping, stepping or other design considerations.

## Conclusion

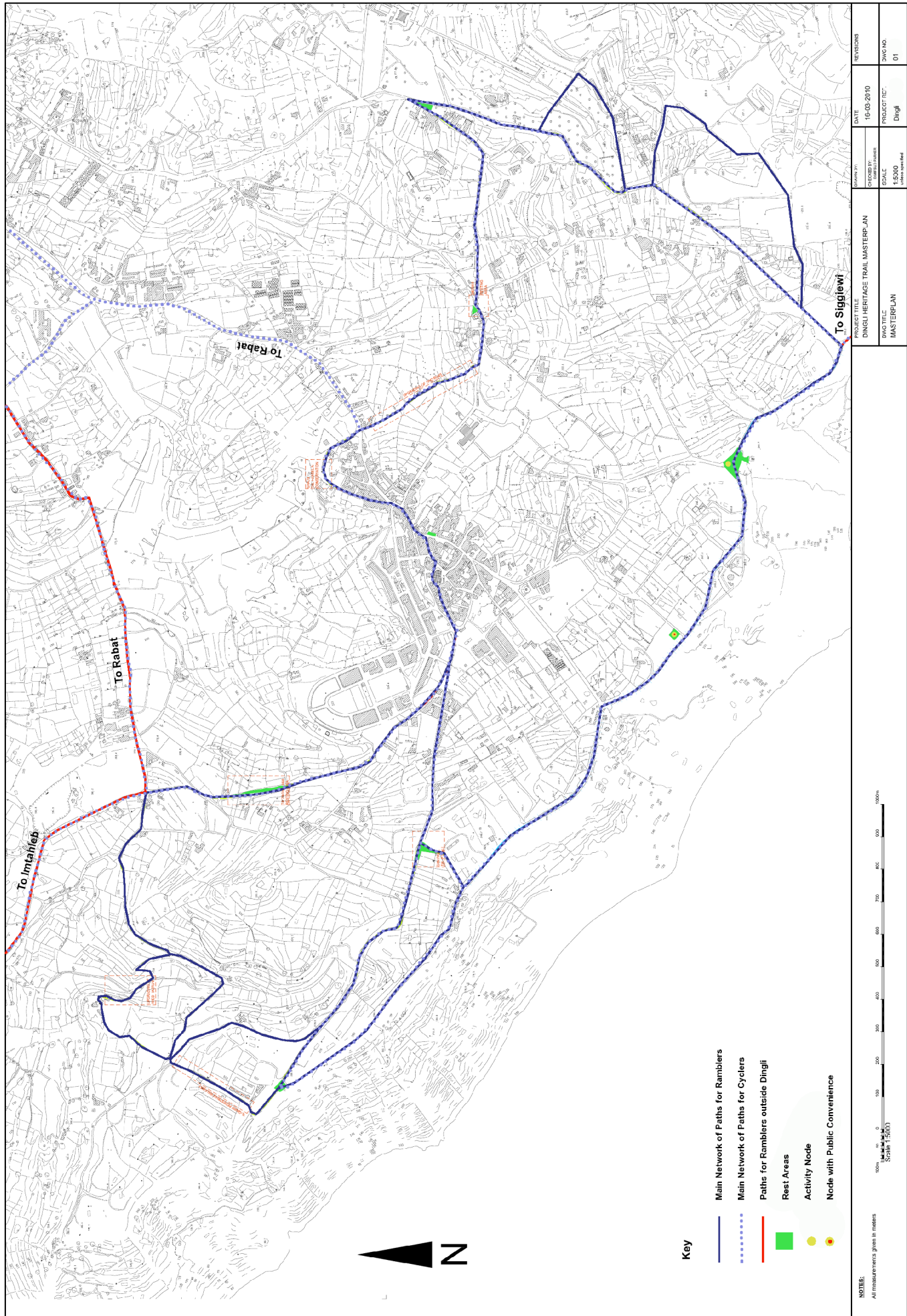
We believe this locality has much to offer to residents and local/ foreign tourists alike. Through simple measures the products of this locality may be preserved and improved and made available to the avid visitor. Reviewing these proposals from time to time would create a dynamic feedback in order to continually improve the product.

## References

- MEPA (2000), *Planning Guidance Swimming Pools Outside Development Zones*.
- MEPA (2006). *North West Local Plan*.
- MEPA (2007) *Policy and Design Guidance Agriculture, Farm Diversification & Stables*.



Figure 7.1: Pedestrian and other routes as per Policy NWDG 3







## Chapter 8

# Sustainable Tourism in Rural Living





## Dingli Heritage Trail

In its drive to upgrade and launch novel experiences that enhance the social and environmental capital that Dingli is so rich in, the Dingli Local Council sought the expertise of various professionals to construct proposals and plans for a series of projects aimed at insuring the supply of Informational Nodes for Socio-Cultural and Environmental Sustainability. In addition to strengthening the sustainable potential of Dingli, such projects also serve to ensure that the eventual targets get their fair share of Dingli-related information whether these comprise Dingli residents, local and foreign visitors, or students and researchers. The first step in this vision was the establishment of a Dingli Heritage Trail that identifies and conserves local historical monuments, and social activities such as culinary and agricultural activities. Future activities may include the launching of an Information/Interpretation Centre (regional tourist centre and learning centre), and the protection of Natura2000 protected zones and marine aspects that are so prevalent in Dingli.

# Part I: A Programme for Sustainable Tourism

David Pace

Dingli is a geographical, geological and agricultural gem. It is one of the few areas that lends itself to the development of rural tourism in Malta. Geographically the area has some of the most spectacular cliffs on the island and a very important river valley that still contains a relict population of Holm Oaks. Geologically, it is one of the few areas where all the Maltese rock layers can be found, a fact that has had an effect on the soil in the surrounding area by providing a rich layer of *terra rossa* soil for agriculture, and a number of perched aquifers above the clay layer that provide water all year round. This has resulted in fertile, well-watered tracts that provide excellent crop land. The latter is the reason why Dingli is still quite an agricultural town that can be easily converted into a market town by the development of a rural tourism plan of which Dingli should be the focal point. This can lead to better networking of agribusiness and agri-producer SMEs in the general area and more efficient ways to market local traditional products such as cheeselets, wine and honey.

The Heritage Trail is the very first step in what should be a plan to make Dingli the seed out of which Agri- and Rural Tourism can start developing to reach nearby towns such as Rabat and Mtarfa, and hamlets such as Bahrija and Mtahleb. This may provide a viable alternative to mass tourism and the successful mass marketing of our culinary and cultural traditions sustainably. The construction of an Interpretation Centre goes hand in hand with this vision as it can provide the vital role of a unique regional tourist office and educational centre dealing with alternative and sustainable forms of tourism that are so lacking in this part of Malta. In general, the Dingli Heritage Trail should be viewed in its entirety as a rural tourism package offered to Dingli visitors. To exploit this in full, after the Trails successful inception, the next step should be the development of more detailed aspects that culminate in a number of stops exploiting different

aspects of the Trail – historical, biodiverse and culinary. This will provide a comprehensive package that offers a variety of products including wine tasting, honey and cheese tasting, and the purchase of traditional agri-products from local producers.

Such a programme will provide a seed for the development of rural tourism routes in Dingli that can be extended beyond the scope of the current Dingli Heritage Trail eventually encompassing the entire town and even nearby settlements such as Rabat and Mtarfa, and Hamlets such as Bahrija and Mtahleb. The setting up of an Information/ Interpretation Centre will help in the coordination of the Heritage Trail and its eventual expansion. The main points in this trail should include a focus on information in that every stop should have a small board pointing out specific characteristics of the area. Examples include

- » Rubble-walls; What use are rubble walls? Why are they important?
- » Fields; What type of soil do they have? What crops do they grow?
- » Pond; What is its importance? What lives in it?
- » A freshwater stream: What is its importance? What legends or traditions has it developed in the rural community?
- » A Woodland area: What type of trees and birds? Is it an area of special conservation?

Another focus should be put on the characteristics that make Dingli special: the geology and the geography, the history, the biodiversity and the people. Indeed, the Heritage Trail can be used as a pilot project and build upon to encompass the entire town.

## Specific areas of special interest

### Ghajn Tal-Hassellin

The area leading to the Ghajn is heavily festooned with Mulberry Trees, while the humid area around the spring proper is full of Maidenhair Ferns (*Tursin il-Bir*). Both can provide a tourist attraction as part of a trail describing Dingli's natural and cultural heritage. Freshwater

springs that flow in Summer are very rare and the path leading to it should be cleared. An added attraction could be fresh mulberry picking in season.

## Triq Ir-Ross

This provides a traditional pathway through a rubble-wall delimited narrow road. Fields on each side are fertile and provide different types of produce. They also have a number of fruit trees. It would be interesting to ask the owners whether they are interested in receiving tourists and allowing them to observe Maltese farming traditions in action and sample and buy fresh produce and fruit, for example Prickly Pears and figs when in season.

## Villa Psaigon Resting Area

This can provide a meeting place for specific tours that leave on specific times to follow the rural walk. The walk can be advertised on the MTA website and agri-business producers, food sellers and wine-makers from Dingli can form part of the tour as specific stops for tourists where they can display and sell their wares.

## St. Paul's Statue

The *Ghajn tal-Hassellin* and other historic sites including the Church and a number of Chapels can form the basis of a historic tour of Dingli. After the success of the Heritage Trail, the Local Council should also look at specific walks focusing on different aspects of the locality including biodiversity (flora and avifauna), geology and geography (cliffs and cliffside communities) and culinary (different products produced in the Dingli area).

## Wied Ħażrun

Valleys are always areas of special interest. In the case of Wied Ħażrun, it has a very rare stand of Holm Oaks and so should be a landmark area on the rural trail with specific boards explaining its importance. The area should also be studied for its potential as an ornithological site. Such areas also contain swathes of garigue and maquis, both of which are typical Maltese habitats that contain many different types

of plants and animals. Boards explaining the biodiversity to tourists should be designed and placed here. The valley proper can be used as a fieldwork area for specific school projects.

There are areas of cultivated land near this valley and it must be sure that there is no conflict between visitors passing close to such areas and the farmers.

## Ta' Żagħfrana

One of the most promising parts of Ta' Żagħfrana is the open space consisting of overgrown derelict land. An examination of the potential of the area being converted into a small woodland by planting a number of Aleppo Pines and Holm Oaks, and changed into a picnic area should be studied.

## Conclusion

In general, the Dingli Heritage Trail should be viewed in its entirety as a rural tourism package offered to Dingli visitors. To exploit this in full, after the Trails successful inception, the next step should be the development of more detailed aspects that culminate in a number of stops exploiting different aspects of the Trail - historical, biodiverse and culinary. This will provide a comprehensive package that offers a variety of products including wine tasting, honey and cheese tasting, and the purchase of traditional agri-products from local producers. Such a programme will provide a seed for the development of rural tourism routes in Dingli that can be extended beyond the scope of the current Dingli Heritage Trail eventually encompassing the entire town and even nearby settlements such as Rabat and Mtarfa, and Hamlets such as Bahrija and Imtahleb.

The setting up of an Information/Interpretation Centre will help in the coordination of the Heritage Trail and its eventual expansion, and it is to this concern that this paper now turns to.

## The Dingli Information/Interpretation Centre

### Education

The Centre should provide all the information on the area to the extent that it will become a sort of local tourist office. General information regarding all aspects of the area including public transport, number of churches/chapels, etc can form part of a computer node which the tourist can access without the need of extra personnel. This function can eventually encompass not just Dingli but nearby settlements such as Rabat and Bahrija. A media presentation similar to (albeit on a smaller scale to the Mdina Experience) can form part of the tourist's visit to the centre against a nominal fee; or if local traditional food is served, can form part of an audio-visual culinary experience. Such a presentation is not difficult to produce and can be a very good introduction of the area to the tourist. The points raised by the document regarding endemic and indigenous animals and plants are valid. More importantly is the way the Centre can be used as a fieldwork centre for geography, environmental studies and biology students. Due to very dark nights over cliffs that are still relatively free from light-pollution, the centre can also host Astronomy sessions with the local club and night-hikes to examine nocturnal animals or for simply the sense of

adventure. So although the area does not support night life activities, new experiences can be provided. All these activities will increase the number of people visiting the Centre and will also help make it more financially viable. The centre should also act as a coordination point and have a map displaying all the stops on the Heritage Trail and special attractions of each part of the trail. Leaflets and booklets detailing the trail itself and specific topics associated with it can be sold from the centre. Examples include:

- » A detailed booklet about the entire trail with a map, main attractions and information.
- » An ornithological guide showing where the best bird-watching sites over the cliffs are situated and the types of birds that may be seen.
- » A biodiversity guide showing the different types of plants and animals that can be found in different habitats such as garigue, maquis, woodland, Cliffside, freshwater streams and ponds.



- » A geological/geographical guide for children detailing the importance of the Cliffs, the rock layers and the habitats found there.

### Conservation

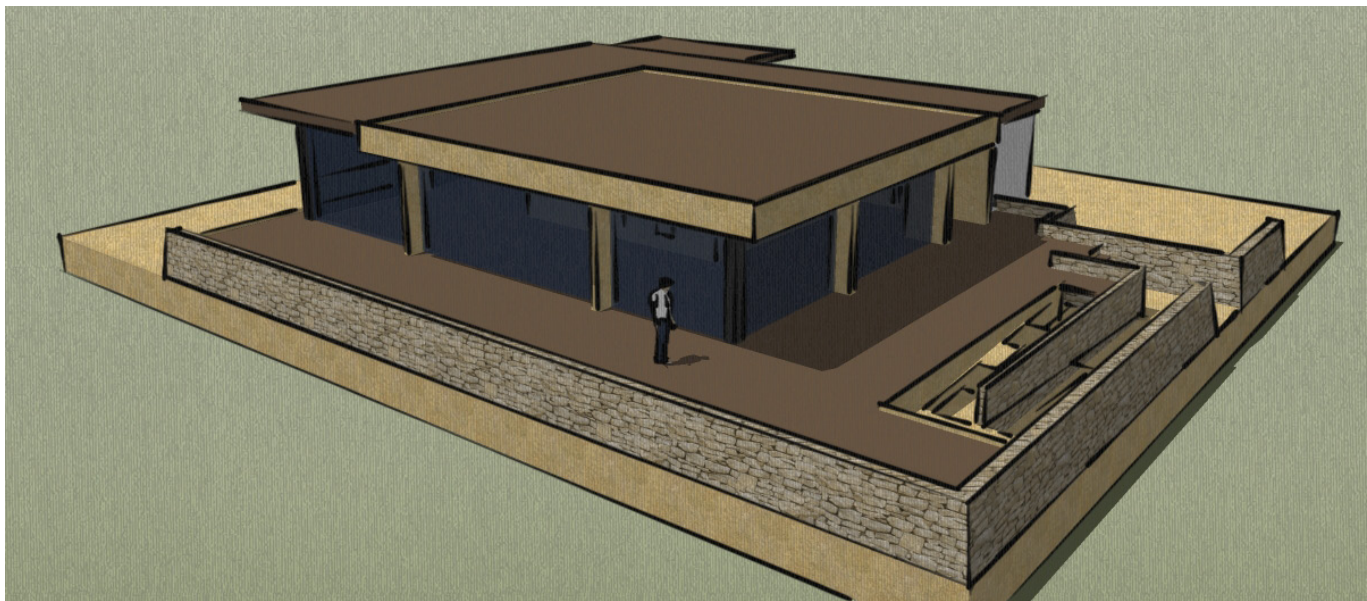
Part of the Centre should be devoted to illustrating the effects of environmental problems affecting the area including illegal dumping, demolition of rubble walls, soil degradation, off-roading, trampling, lighting of fires as well as light and noise pollution. A leaflet detailing all this can be made available.

### Farming

The Centre should also be an advertisement for agribusiness and food producers found in the immediate area many of who may also form part of the Heritage Trail in the future. Information on wine, cheese and honey producers in the area and organic farmers in the vicinity should be displayed in the centre.

In summary, this Centre has the potential of setting a standard for similar centres all around the island. It can also become a focal tourism point for Dingli and eventually nearby settlements. The most important aspect is that the centre is financially viable. This can be done by the provision of a number of services including serving food, selling information (booklets, leaflets, maps, binoculars, souvenirs, etc.) and displaying and selling traditional local products from Dingli.

**Figure 8.1.1: An artist's impression of Dingli's Interpretative Centre**







# Part II: Conservation of Dingli Heritage Trails

David Mifsud Parker, mc<sup>2</sup> architects

## Għajn tal-Ħasselin (Triq il-Għajn, Ħad-Dingli)



The natural spring commonly referred to as 'l-Għajn tal-Ħasselin' is located on the northern fringe of the small village of Ħad-Dingli. The existing monument is an approved Grade 1 heritage compound of great architectural and historical importance. The spring is accessed through a pedestrian walkway off Triq il-Għajn and consists of a 'highly ornate nymphaeum' and a 'fresh water spring with a rockcut tunnel'. The main aim of this method statement is to conserve the beauty and importance of this monument by upgrading the dilapidated state of its fabric and the surrounding areas.

Very little is known about the origin of the nymphaeum and spring however it most probably formed part of the properties of Baron Inguanez given its location close to his residential complex. Over the years the natural spring was used by the local community as a washing well and a social gathering point. However with the arrival of tap water in individual households the *raison d'être* of the spring seized to exist.

A signpost erected recently indicates the entrance into the site from Triq il-Għajn. Unfortunately, the pedestrian walkway and occasional flight of steps leading to the spring are in a great state of neglect and the access is not safe to the general public. The existing nymphaeum

was constructed against a sheer rock hewn face and integrated within the rock cut tunnel that serves as the main feed of the continuous natural spring. Thus the constructed facade is in continuous contact with water resulting in a very humid environment. Furthermore the presence of water increases the growth of plants and heavy vegetation around the monument. This gives a nostalgic characteristic of ruins that should be retained as long as it does not endanger the existing structure.

The overall condition of the majority of the masonry fabric is good and the characteristic alveolar weathering and severe back weathering related to old buildings locally are non-existing since the infiltration of salts in the stone is minimal. The main forms of deterioration mechanisms that can be noted over large areas of the facade are:

1. Blackening due to the accumulation of dirt over the years and the humid environment,
2. Vegetation over very large areas including the nymphaeum and the access passageway, and
3. Moss and mould growth especially in the lower areas due to the continuous contact with water.

In some areas the accumulation of subsequent layers of dirt resulted in the formation of black crust that eventually loosens out to reveal a whitish layer of fragile gypsum fragments. This phenomenon is highly noticeable in the area where there once was a coat of arms and possibly an inscription that are completely lost.

The existing pedestrian passageway must be cleaned of all vegetation and overgrowth that is hindering the safe access to the site. The existing stone pillars indicating the direction of this route will be retained in their existing state and location. It is not the intention of the proposal to construct or try to re-invent a possible access however removed stone steps will be reinstated as an issue of safety.

## The Nymphaeum

The main aim of the proposed interventions is to conserve the existing facade by cleaning the blackened areas, removing any roots and vegetation that has infiltrated the existing blockwork, consolidating fragile areas, pointing any loose joints, and reinstating the mechanism of the natural flow of water. Prior to the commencement of works proper access scaffolding must be assembled along the facade in order to provide safety to the workmen on site. The external face

of the scaffolding shall be protected with approved netting in order to mitigate against dust propagation. The scaffolding used must be

compliant with the Occupational Health and Safety Guidelines. The franka masonry used in the construction of the nymphaeum will be cleaned using the least damaging methods. In this case dry brushing will be used over all the

external blackened surfaces and if the blackening persists wet brushing and the use of a nebulous mist will be applied to soften the adherence of dirt to the stone. In areas where delamination is present a proper lime based consolidant will be used to protect the existing soft stone fabric from further deterioration.

All the open and weak joints shall be raked out and re-pointed using a hydraulic lime based mortar. In areas where the pointing is strong no intervention will be required. As explained before the proposed intervention does not seek to remove the vegetation over-growth that springs out of the surrounding rock-face. However the plants sprouting out of the masonry joints will be removed and a proper biocide applied to prevent further growth and damage to the masonry. The intended flow of natural water from the rocks through a series of

channels and constructed containers should be reinstated by carefully removing all mud deposits that are hindering this mechanism. The removal of these layers must be carried out under the surveillance of an archaeological monitor approved by MEPA.

The importance of the 'Ghajn' cannot be underestimated and it is our duty to conserve this heritage monument for the future generations.

## St. Paul's Statue (tal-Pitkali, Ħad-Dingli)



The statue of St. Pauls is situated on an isolated agriculture building in the midst of the countryside in the area referred to as 'San Pawl tal-Pitkali'. No historical documentation exists of the creation or the

benefactors of this statue. From an inspection on site it is evident that the statue is in a very advanced state of deterioration as can be seen from the attached photographs. The idea behind conserving these remains is to retain as much as possible the original fabric of the sculptured statue. As part of the conservation process the statue will be dismantled off site and taken to a specialised laboratory to be reshaped by specialised conservators.

The statue will be treated with consolidants to preserve as much as possible the flaking layers of limestone. Furthermore old photographs will be used to build the previous profile in thin lime based layers. The Baker Method can be used to slowly build up the original profile and this can take months to complete. When the treatment is complete the statue will be re-erected in its original location on top of the agriculture building overlooking the than newly embellished area of 'San Pawl tal-Pitkali'.

## Dry Random Rubble Walls

The proposed Dingli Heritage trail seeks to upgrade and revitalise pedestrian passageways outside the development zones that were left to dilapidate over a period of years. These lanes include Triq ir-Ross, pedestrian walkway in Triq il-Qaws, and a pedestrian walkway in Wied Ħażrun. Other demolished walls that will be reinstated include walls in the area known as 'San Pawl tal-Pitkali'. Part of this upgrading exercise includes the conservation and reinstatement of dry random rubble walls that collapsed due to a variety of reasons from giving out to retaining pressure to human vandalism.

The height of the rubble walls vary considerably from approximately 0.6m to over 2m in certain areas. The proposed reinstatement of walls will retain the existing height and in areas where the height cannot be determined the walls will be reinstated to the lower height mentioned above. This will help the ramblers and general public to experience

the countryside when walking through these lanes. The width of the rubble walls vary from 0.4m to approximately 0.8m. In all cases of collapses the resting foundations of the walls are still visible and this makes it easier to follow the existing widths in cases of reinstatement.

The construction methodology used will be to reinstate the walls using the original hard rubble stone found on site. In cases where the rubble walls were removed similar stones will be brought on site and used. The walls will have to be reinstated by a professional dry rubble wall builder and no cement or any other binding agent is to be used.

As part of the conservation process any later accretions resting on the wall such as disused oil drums and other wreckage will be removed to retain the original profile of the wall.





# Part III: Technological Enhancements of Sustainable Tourism

Jacqueline Azzopardi Cauchi, Saviour Formosa, and Sandra Scicluna

## The need for a wider informational approach

The sustainable tourism section has identified the need for the consolidation of, upgrading of or launching of new experiences that will enhance the social and environmental capital that Dingli is so rich in. These include the already successful implementation of the Heritage Trail and the identification of historical monuments and social activities such as culinary and agricultural activities. Future activities identified include the proposal to launch and Information/ Interpretation Centre (regional tourist centre and education centre) as well as other instances which can be further investigated such as the Natura2000 protected zones and the marine aspects, amongst others.

All these proposals instigate the need for a study of the informational and technological enhancements required to ensure that the eventual targets get their fair share of dingli-related information: whether composed of Dingli residents, local and foreign tourists as well as students and researchers. Such proposals and plans require the implementation of a series of projects/activities aimed at insuring the supply of Informational Nodes for Socio-Cultural and Environmental Tourism Sustainability.

The Interpretation Centre is already a viable option but would require enhanced processes to ensure the sustained dissemination of the information and services highlighted in this publication. At the same

time the proposal is aimed to investigate the sustainability potential that the areas under study offer to the Community in terms of social and recreational impact.

The main aim of the proposal is to ensure that:

1. surveys are carried out in order to gain knowledge on the number of visitors to the area: by time, type, purpose, etc;
2. information is gathered and compiled on the areas from the different sources and compiled in an information node in the locality;
3. an interactive tool is created enabling visitors to gain knowledge on the area and maintain a healthy upgrading of the identified areas;
4. an impetus is given to market the green-space psycho/socio/ physico effects that the Dingli Cliffs and surrounding areas provide to the National health levels; and
5. a hi-end technological product is developed to create a 3D model of the areas for virtual interactive visitors

## A Phased Approach

The process will require a phased approach that will ensure the implementation of the data cycle for this project, inclusive of a project design phase, desk-based study phase, data gathering phase, analysis phase and the tool creation phase.

The process will initially start with an investigation of the perceptions of both locals and visitors on the locality in terms of the tourism-related items mentioned in this chapter. Such entails the following aims and related milestones and targets:

### Phase 1. An identification of the visitors and local's perception to Dingli's sustainability issues: A survey approach

This phase proposes to carry out interviews and surveys with locals and visitors on how best to ensure that the areas are sustained to their high level and to enhance those that require maintenance: this survey will be based on on-the-spot interviews and national sample surveys to gauge what is termed as sustainable and what is the current perception on sustainability specific to Dingli.

**Milestone 1:** A document enhancing visitors' perception as contrasted with official views of social and environmental sustainability and describing the real-world needs to sustain Dingli's environmental (natural-social-physical) as perceived by the locals and visitors. This milestone will also produce an enhanced and detailed information system of all the sustainability issues identified with deadlines for implementation and contrasted in line with the recommendations and outcomes of the studies highlighted in this publication.

**Target 1:** To review national concepts on sustainability from published documentation and to design a survey targeting the public in general and visitors/residents in particular with special reference to the areas/themes identified in this Chapter. These include the Heritage Trail, the identification of historical monuments, the social activities such as culinary and agricultural activities and the Natura2000 areas of Dingli Cliffs. This phase will include a pilot study and a full survey with visitors to the area with a relative sample to the national public. This will also be related to other studies carried out at a national level on the public's perception of the area under study. The survey structure will be structured in a way to enable other localities to replicate the process in their localities, starting with those neighbouring Dingli. The

targeted questions will be based on the three themes under review: the physical structures, the social parameters and the natural landmarks.

**Outputs 1:** A report highlighting the findings of the study which will ensure that the uptake at council as well as at national level will be implementable. The survey structure will also be made available for replication.

### Phase 2. An informational node – a one-stop shop for information: A Desk-Based Survey

This phase proposes to carry out a desk-based survey in order to gather and compile all information on the areas from the different sources such as academic documentation, Dingli-related publications, on-line sources, subject plans, local plans, legislation and others. The result will be compiled into an information node in the locality which will be located in the Centre identified in Chapter 8.1 which will also serve as a defacto tourist office based on a library-concept. This project phase is intended to create a digital node for all the information which will enhance the analogue (hardcopy format) documentation and add more hi-end interactive information systems for the use of both the resident and the visitor.

**Milestone 2:** A compilation of all the documentation available (analogue or digital / current and historical) through a library information system which will also be brought together through a digital information node.

**Target 2:** To gather and compile a digital library listing information on the area which will be scanned where possible or acquired in digital format.

**Outputs 2:** An information node will be made available at the local council office together with a relative web-enabled page documentation said library. Use of proprietary software such as AdLib as well as others technologies created by the authors will be made.

### Phase 3: The Virtuality-enabling of sustainable continuity – a digital interactive approach

This phase proposes to create an online interactive tool enabling visitors to gain knowledge on the visualization, informational and sustainability issues and allow users to suggest improvements and enhancements to the areas: this enables visitors and locals to have an ongoing say in ensuring sustainability as well as give policy makers access to continuous public feedback. This ensures both information dissemination and public participation enhancement. This can take the form on computer nodes as well as stand-alone interactive kiosks that can be place in strategic locations within the Council offices and other areas as well as being disseminated via the web. This would include avatars to help the visitor walk through the exhibit, identify the best routes inclusive of the heritage trail as well as provide an online version of the reality that is Dingli. This phase allows for visitors to hire an information node where through GPS/GPRS technology the node will narrate instructions and information whilst travelling through Dingli.

**Milestones 3:** An online interactive tool enabling visitors to gain knowledge of the areas prior to visiting as well as to ensure information dissemination through a querying system and also provide a tool to allow the public to participate online in view of improvements.

**Target 3:** To create an interactive tool enabling visitors to study the locality prior to visiting, such tool will include information snippets, imagery, hotspot markings for visual perceptions such as vista imagery. This stage will also review the possibility of creating walking path travellers' mobile nodes which they can download to a PDA or potentially hire one from the council which would give them information when they reach a specific information node in the locality spots (ex: the Cliffs Chapel would have an info node coded for example as an A, where the visitor would click on the A info node on his/her PDA and the text/voice over would be transmitted – an enhanced version would automate the process based on spatial localisation. This tool will also include quizzes (treasure troves) and other interactive material for generation of content. New information inputted by the visitor can then be uploaded to the main site for updating purposes. This also ensures that illegalities, vandalism and other activities both positive and negative have a real-time update cycle.

**Outputs 3:** An interactive tool for PDA/mobile/web consumption and linked to specific points on the earth for multimedia purposes.

### Phase 4: A Marketing strategy – a green-space/recreation approach

The next Phase calls for an integration of the highlighted proposals identified in 8.1 and 8.2 which ultimately aim to serve as a fulcrum to market the green-space psycho/socio/physico effects that the Dingli areas provide to the National health levels. This is due to the concepts of pure air, clean water, fertile soil, low or inexistent noise and low person-per-area density.

**Milestones 4:** An online visual tool that helps to 'market' the green-space of the areas and promote healthier living as enhanced through the effects of psychological, social, physical effects that the Dingli areas specifically the Dingli Cliffs and the rural areas provide.

**Target 4:** To create an online tool highlighting the green-spaces and open recreational areas. This will be integrated with other tools such as google earth/maps. The social, physical and psychological aspects will be analysed and spots of serenity and well-being will be highlighted. Experts in the three fields will be brought in to help outline such areas of tranquility through sustainability of the current and enhanced practices.

**Outputs 4:** An interactive online tool describing the areas of tranquility, the best visiting times and the available measures required to ensure a tranquil and quiet visit to the area. Also psycho, socio and physico highlights will be depicted so that users can interact with the locals and with other visitors on the areas providing diversity from normal everyday hectic life. A forum or social network can be created either through an existing technology or through the creation of a new network.

### Phase 5: A Hi-End Spatial Approach – Virtual Dingli

The final phase proposal the most ambitious project yet. It combines state of the art technology and the availability of data from sources emanating from the Geographical Information Systems (GIS) field. This phase proposes to create a 3D model of the areas for virtual interactive visitors, which through the use of spatial technology, visitors can visit Dingli prior to actually arriving at the locality. A 3D Model of the Town, the surrounding landscapes, the cliffs, the sea and



other areas will enable users to walf around the areas and interact with the other information nodes.

**Milestones 5:** A 3D model of the areas for virtual interactive visitors: the online model will enable users to view their locality using such tools as Googlemaps

**Milestones 6:** An interactive CD/DVD on the locality for dissemination purposes

**Target 5:** To create an interactive tool enabling visitors to visit the areas under study in 3D using web and spatial technologies. This output is innovative in that users can view Dingli in a three-dimensional aspect using normal web tools and view the locality in an interactive model. Imagery and location description will also be provided.

**Outputs 5:** An interactive 3D model of the area under study integrating most information from all the other milestones. The CD/DVD will provide a robust version for office/home consumption which will allow users to interact more deeply with the digital version of the locality and ensure more detail than the complementary web-enabled version.

## Conclusion

This Chapter proposed various technologies which though preferably sequential in nature, could be implemented in a parallel approach which will allow visitors to interact with the process and help enhance the model. It is imperative that Dingli integrates both traditional and hi-

end technologies in other to ensure its sustainability process. Tourism has made remarkable inroads into technological enhancements and Dingli has all the ripe ingredients to ensure integration of all the aspects identified in this chapter.









## Chapter 9

# Energy Audit of the Office Building, Dingli Local Council

Jonathan Scerri, Econing Engineering Consultancy Ltd.





## Introduction and Methodology

**Figure 9.1: Dingli Local Council premises**



As part of the Energy Management Programme which is currently being developed by the Dingli Local Council, an energy audit of the office building which includes the underlying public conveniences is being conducted.

Concurrently with the preparation of this energy audit of the council building and underlying public conveniences, an energy audit of the public areas in the locality of Dingli including the street lighting is being prepared.

In line with the requirements and commitments by the locality of Dingli in the Covenant of Mayors, Econing Engineering Consultants has also been entrusted with the preparation of a Sustainable Energy Action Plan (SEAP) which shall outline the relevant proposals to reduce or offset the CO<sub>2</sub> emissions in the locality by at least 20% by 2020 and prepare a baseline emissions inventory as a basis for the SEAP.

Moreover, as part of the future plans of the local council, a new civic centre for the locality shall be constructed, the plans of which shall be

reviewed later on, for compliance with the minimum requirements for energy efficiency of buildings related to the resistance to the passage of heat, conservation of rain water and artificial lighting (Technical Document F).

Therefore, in this report, Econing Engineering Consultancy Ltd shall

- » Identify the energy use which includes the present and recent historical energy utilisation of the Dingli local Council building and underlying public conveniences.
- » Identify the possible solutions, both technical and behavioural for the conservation of energy. These solutions are based on the data submitted by the local council, the site visit and by technical evaluation of the data gathered.
- » Propose long term upgrades to the existing building and its facilities that may reduce the running cost.

This report shall provide the Dingli local council with the various options available for the reduction of wastage of energy, the costs involved in achieving the targets taking into consideration the payback period and the benefits (particularly financial) achievable from the implementation of these energy-conserving opportunities (ECOs).

A walk-through inspection has been conducted in the premises including both the offices and public conveniences and several data has been collected to be analysed in further detail.

Such information includes the

- » Building / architectural layout and use including the number of daily hours of operation and number of staff and room dimensions. Data on the external envelope of the building shall also be collected.
- » Electrical lighting and power plans.
- » Air-conditioning installations.
- » Amount and type of electronic data processing equipment used in the office building.
- » Energy consumption data which shall be used for the purpose of power correction factor.

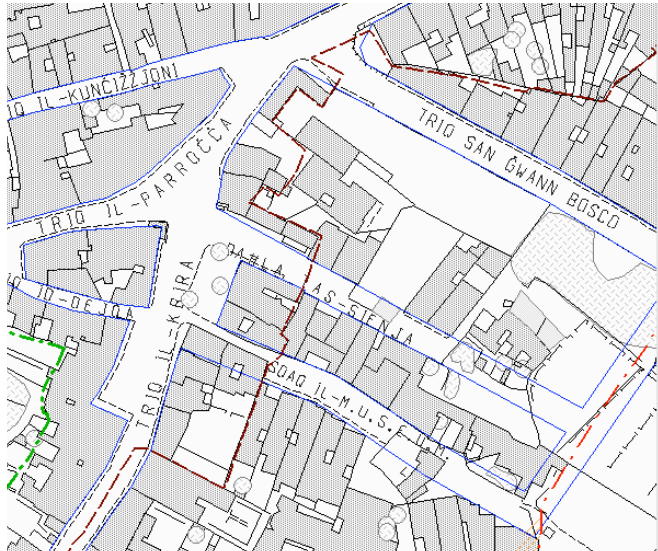
Once this data have been collected, it was discussed with the Mayor and Executive Secretary to further clarify the operating practices and energy consumption trends. Other information relevant to the compilation of this report was also discussed.

## Building Survey and Use

The building located at Dahlet is-Sienja, Dingli, can be subdivided into two distinct uses namely the area utilised exclusively by the Dingli Local Council which consists mainly of offices, reception area and toilets and the public convenience situated just underneath the local council offices at ground floor level.

The façade of the building is South-West facing and therefore is exposed to a considerable amount of direct sunlight during the day.

**Figure 9.2: Site Plan indicating location of building**



The building which is built on a footprint of approximately 62m<sup>2</sup>, consists of a basement, ground, first, second and roof floor levels. Since it is made up of 5 floors (including the basement and roof floor levels), the building can be further classified as having approximately 240m<sup>2</sup> of office area (including storage areas used by the local council for the normal running of the premises) and 30m<sup>2</sup> used as public convenience.

**Figure 9.3: Reception Area**



Currently there are 3 full-time persons, 2 part-time (including the Mayor) and four members of the local council which visit the building on a regular basis. Moreover, a number of persons call on by appointment to the local council's office and these are normally received at the reception desk and a number of persons using the public convenience.

**Figure 9.4: Council building entrances**



The approach taken in the preparation of this energy audit report included a comprehensive walk-through of the mixed used building where the equipment installed / used together with the operational processes have been noted. Such data includes the building envelope, electrical systems, air-conditioning systems, lighting systems. On the other hand, the consultation with the key personnel of the Dingli Local Council was very important to identify the operational patterns and thus compile a more accurate database for the preparation of the report.

The following tables give a breakdown of the normal operation of the local council building and of the public convenience:

**Table 9.1: Operational Period**

	Winter Period	Summer Period
	1st October to 15th June	16th June to 30th September
<b>COUNCIL BUILDING (OFFICES)</b>	08.00 – 17.30 (Mon to Fri) 08.00 – 12.00 (Sat only)	07.30 – 13.30 (Mon to Fri) 07.00 – 12.00 (Sat only)
<b>COUNCIL BUILDING (FACADE LIGHTING)</b>	20.00 – 23.00	20.00 – 23.00
<b>PUBLIC CONVENIENCE</b>	07.00 – 18.00	06.00 – 20.00

**Table 9.2: Operational Hours**

	Winter Period			Summer Period			Total Operational Hours
	1st October to 15th June			16th June to 30th September			
	Days	Daily hours <sup>1</sup>	Total Hours	Days	Daily hours <sup>1</sup>	Total Hours	
<b>COUNCIL BUILDING (OFFICES)</b>	174	9.5	1653	73	7	511	<b>2164</b>
	36	4	144	15	5	75	<b>219</b>
<b>COUNCIL BUILDING (FACADE LIGHTING)</b>	258	3	774	107	3	321	<b>1095</b>
<b>PUBLIC CONVENIENCE</b>	258	1 <sup>2</sup>	258	107	1 <sup>2</sup>	107	<b>365</b>

Electricity is supplied from Enemalta Corporation and therefore obtaining the electricity bills for the last years, the average yearly consumption can be calculated. But, since the bills for the last years have not been issued by the utility company the reading of the electricity meter from the installation day to date was taken.

Although the average yearly consumption of electricity has been calculated as shown below and was found to be 12,415 kWh, still this could not be further subdivided periodically in line with the normal issue of the energy bills for the above mentioned reason.

**Table 9.3: Energy Consumption and Cost**

	Consumption (kWh)	Cost (€/kWh)	Total Cost (€)	Period
<b>COUNCIL BUILDING AND PUBLIC CONVENIENCE</b>	56,529	0.203	11,475	19.08.2005 to 27.02.2010 (1662 days)
	12,415	0.2033	2,520	Yearly

Given that the total amount of annual energy consumed by the council building including the public conveniences, the building energy

performance index (BEPI) and the building energy cost index (BECI) can be calculated and are hereby being given in the tables below:

**Table 9.4: Building Energy Performance and Cost Indexes**

Annual Energy Consumption	12,415 kWh
Annual Energy Cost	€ 2,520
Total Area of Building (offices and public convenience)	270m <sup>2</sup>
Building Energy Performance Index	45.98 kWh/m <sup>2</sup>
Building Energy Cost Index	9.33 €/m <sup>2</sup>

## Energy Consumption and Recommendations for Energy Management

### Lighting

#### Present Situation

**Table 9.5: Electrical Lighting Load**

Description of lighting load	Qty	Load (W)	Total Load (W)	Average annual use (hours)	Total Annual Consumption (kWh)
Incandescent lamp in lift machine room	1	40	40	2	<b>0.08</b>
Incandescent lamps in public convenience	10	40	400	365	<b>146</b>
Single fluorescent T8 lamp at basement floor level	1	58	58	20	<b>1.16</b>
Incandescent lamps in lobbies at ground floor level	5	40	200	2383	<b>476.60</b>
Double compact fluorescent lamps at ground floor level	9	2 x 18	324	2383	<b>772.09</b>
Halogen display lamps at ground floor level	8	20	160	50	<b>8</b>
Halogen lamps at first floor level	12	20	240	1000	<b>240</b>
Double compact fluorescent lamps at first floor level	8	2 x 18	288	2383	<b>686.30</b>
Double compact fluorescent lamps at second floor level	10	2 x 18	360	500	180
Halogen lamps at second floor level	10	20	200	50	<b>10</b>
Metal halides flood lights	3	250	750	1095	<b>821.25</b>
Double compact fluorescent lamps at all staircases	8	2 x 13	208	200	<b>41.60</b>
<b>Total Electrical Lighting Load</b>					3,383 kWh

#### Proposals

The incandescent lamps shall be replaced with energy saving compact fluorescent lamps. Currently there are sixteen incandescent lamps with the total annual consumption of 622.68 kWh which is equivalent to €126.40. If these are replaced with energy saving compact fluorescent lamps 18W the total annual consumption will be reduced by €69.53 per year.

The cost to substitute the incandescent lamps with energy saving compact fluorescent lamps would be approximately €130 and when compared to the €69.53 savings per year, the payback period will be less than 2 years.

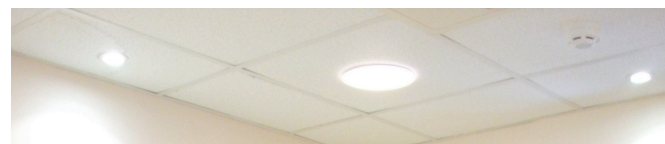
Motion detectors shall be considered in particular areas such as the public convenience cubicles. This will eliminate the possibility of leaving the lights on for long period of time even when the building is unoccupied. On the other hand the common area of the public convenience shall be equipped with light level sensor to light up automatically.

The only single fluorescent T8 shall in the long term be replaced with T5 and with electronic ballast.

In certain areas such as the ground floor level and the second floor level the halogen lamps are normally used as display lighting. Therefore it is hereby being suggested not to replace these lamps.

In the executive secretary's office and the small office adjacent to the latter at first floor level due to the high level of lux the halogen lamps shall be eliminated whilst the four halogen lamps in the secretary office shall be replaced with compact fluorescent lamps. Eliminating and replacing these lamps will result in an annual energy saving of approximately 168kWh equivalent to €34.10.

**Figure 9.5: Type of existing lighting**



## Lift

### Present Situation

The lift is a hydraulic lift type and which is used occasionally during the days of the week. Moreover the cabin is equipped with an automatic lighting and small extractor for ventilation purposes which again is switched on automatically during use. Hence it is estimated that the annual consumption of the lift including the lighting and ventilation

equipment in the cabin shall not exceed 500 kWh given the low usage and high standby position

### Proposals

Due to the very low usage of the lift there are no particular recommendations apart from the replacement of the lighting in the lift machine room at basement level which has already been mentioned.

## Air-conditioning / Heating

### Present Situation

**Table 9.6: Air Conditioning Load**

Unit Type	Quantity	Cooling Load (kW)	Electrical Load (kW)
Split type air conditioning unit	1	14	4.67
Split type air conditioning unit	2	10	3.33
Split type air conditioning unit	3	7	2.33
Total Air Conditioning Installed Cooling Capacity		55 kW	
Total Air Conditioning Electrical Load Capacity		18.33 kW	

In the building there are six split type air conditioning units one of which is in the reception area and two in the executive secretary's office and the office of the council staff. These are the three most used air conditioning units. On the other hand, one unit is in the councillor's room which is not much in use and the remaining two are in the mayor's office which are only used in summer.

» The remaining unit in the councillor's room which is very rarely used is assumed to be switched on for an average annual amount of 50 hours.

**Figure 9.6: Split Type Air Conditioning Units**



Therefore given the total load of 18.33 kW for the six air conditioning units and applying the following assumptions based on the information given by the council staff, the average annual consumption of the air conditioning units stands at 6,307kWh.

#### Assumptions:

- » The three units in the executive secretary, reception and council staff are used for an average of 600 hours annually.
- » The two units in the mayor's office are used for an average of 175 hours annually.

**Figure 9.7: Projected balcony**



During the walk through, temperature sensors have been installed and left in the offices for one week. A significant temperature peak of 27°C has been measured in the office of the mayor and this is mainly due to the projected balcony (made up of wooden fabric and glass) which is not segregated from the room itself and due to the direct sunlight from the roof. The high heat gain is the main reason for which the building has to be cooled in the long summer periods.

**Figure 9.8: Balconies**

More than half of the total energy consumed by the local council building is due to the air conditioning units. These are highly used mainly due to the high u-value of the external envelope of the building which definitely does not comply to the minimum requirements on energy performance of building regulations, 2006 (Document F – *Technical guidance for conservation of fuel, energy and natural resources*). Therefore improving the u-value of the external envelope (not necessarily complying with the minimum requirement) in the short term and replacing the air conditioning equipment with a much more energy efficient equipment in the long term will result in the greatest energy saving from all the other recommendations.

## Proposals

The air conditioning units are of split type and use R-22 refrigerant which is one of the most gases harming the environment and which will be phased out in the near future. Being a relatively new building, and therefore the air conditioning installation is very recent, the decision of installing these type of units which make use of R-22 refrigerant was definitely not the ideal solution.

This means that the local council has to look at other alternatives for the future. We hereby recommend that these units shall be replaced with Variable Refrigerant Flow system (VRF) which consists of a number of air handling units connected to a single external condensing unit, and allow refrigerant flow to be varied using either an inverter controlled variable speed compressor, or multiple compressors of varying capacity in response to changes in the cooling or heating requirements within the air conditioned space. Obviously, this will require a relatively large amount of capital cost but will imply improved efficiency with regards to energy consumption and a much more environmental friendly system.

On the other hand, in the short term, these units shall be maintained on a regular basis and such maintenance programme shall include the cleaning of the indoor filters, cleaning of outdoor units and checking of gas charge. Moreover the improvement of the external envelope of the building, thus reducing the U-value primarily of the balconies and roof as shown in the tables below, will imply less use of the air conditioning units for comfort and thus less energy consumption.

**Table 9.7: Insulation of balconies**

U-Value of exiting balcony wood fabric	7.2 W/m <sup>2</sup> K
Adding 50mm polyurethane insulation	0.468 W/m <sup>2</sup> K
Reduction in U-Value	6.732 W/m <sup>2</sup> K
Area of balcony fabric (excluding windows)	6 m <sup>2</sup>
Assuming temperature difference of	15°C
Reduced Thermal Energy Transfer	606 W
Assuming COP of AC installation	3
Total Annual Savings (for both balconies)	263kWh
	2.1 % of annual consumption

If a solar film is installed on the balcony windows (being in an Urban Conservation Area, a prior approval from the Malta Environment and Planning Authority has to be sought) it is assumed that the above savings can be doubled. The installation of such solar films will imply a capital cost of around €250 per balcony with an assumed payback period of around eight to ten years.

Moreover separating the balconies from the adjacent offices, thus creating an unconditioned space in the balcony will further reduce the heat energy transfer which in turn will increase the annual energy consumption by means of air conditioning. The latter can easily be done in the Mayor's office but very difficult to separate the balcony from the office of the executive secretary due to space limitations.

The bitumen waterproofing membrane installed on the roof of the building is black in colour and hence by simply painting the membrane

with a reflective colour such as white or even silver will reduce the solar gain and hence reduce the air conditioning load.



**Figure 9.9: Bitumen Waterproofing Membrane**

The installation of insulation on the false ceiling of the Mayor's office will again reduce the heat transfer to the building from the roof.

## Electronic Data Processing Equipment

### Present Situation

**Table 9.8: Electronic Data Processing Equipment Load**

Description of equipment	Qty	Normal Rating (W)	Average daily use (hours)	Standby Rating (W)	Average standby (hours)	No of days	Total Annual Consumption (kWh/yr)
Photocopier	1	750	0.5	200	8.5	210	435.75
		750	0.5	200	5	88	121.00
Printer	2	50	0.5	5	8.5	210	28.35
		50	0.5	5	5	88	8.80
Fax Machine	1	250	1	2	8	210	55.86
		250	1	2	5.5	88	22.97
Personal Computers	3	200	4	20	4	210	554.40
		200	3	20	3	88	174.24
Monitors	3	35	4	10	4	210	113.40
		35	3	10	3	88	35.64
Monitor CCTV and equipment	1	70	8	0	0	210	117.60
		70	6.5	0	0	88	40.04
Laptop computer	2	65	2	20	0	210	54.60
		65	2	20	0	88	22.88
Total Electronic Data Processing Equipment Load							1,785.53 kWh

## Other Loads

### Present Situation

**Table 9.9: Other Loads**

Equipment Type and Location	Quantity	Rating (W)	Average Annual Use (hours)	Total Annual Consumption (kWh)
Water pump at basement level	1	375	12	4.50
Water Dispenser	1	550 (Heating) 90 (Cooling)	210 88	288.50
Refrigerator	1	200	4380	87.60
Small Audio Unit	1	20	3000	60
Total Load				440.60 kW

### Proposals

The water dispenser is the most energy consuming item in the above table. This is normally left switched on even when the building

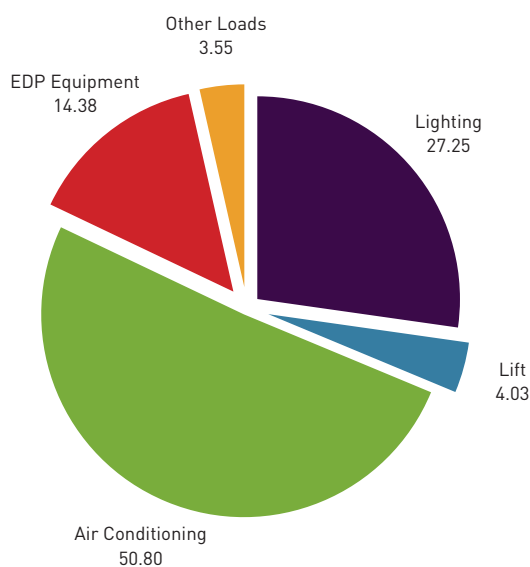
is unoccupied. Therefore it is hereby being suggested that a timer switch is installed to shut down the water dispenser outside normal office hours and this may well reduce the consumption by around 50% equivalent to approximately 140kWh.

### Total Electrical Load and other technical recommendations

**Table 9.10: Summary of Energy Consumption**

Type of electrical load	Consumption (kWh)	%
Lighting	3,383	27.25
Lift	500	4.03
Air Conditioning	6,307	50.8
Electronic Data Processing Equipment	1,785	14.38
Other Loads	440	3.55
Total Energy Consumption		12,415 kW

**Figure 9.10: Graphical representation of the energy consumption**



### Proposals

Currently the local council is in the process of awarding the tender for the supply and installation of a PV system which we assume will be in the region of 2kW power system. This will yield around 3,200 kWh of energy which is equivalent to 25.6% of the total annual energy consumption of the building.

## Summary of Recommendations

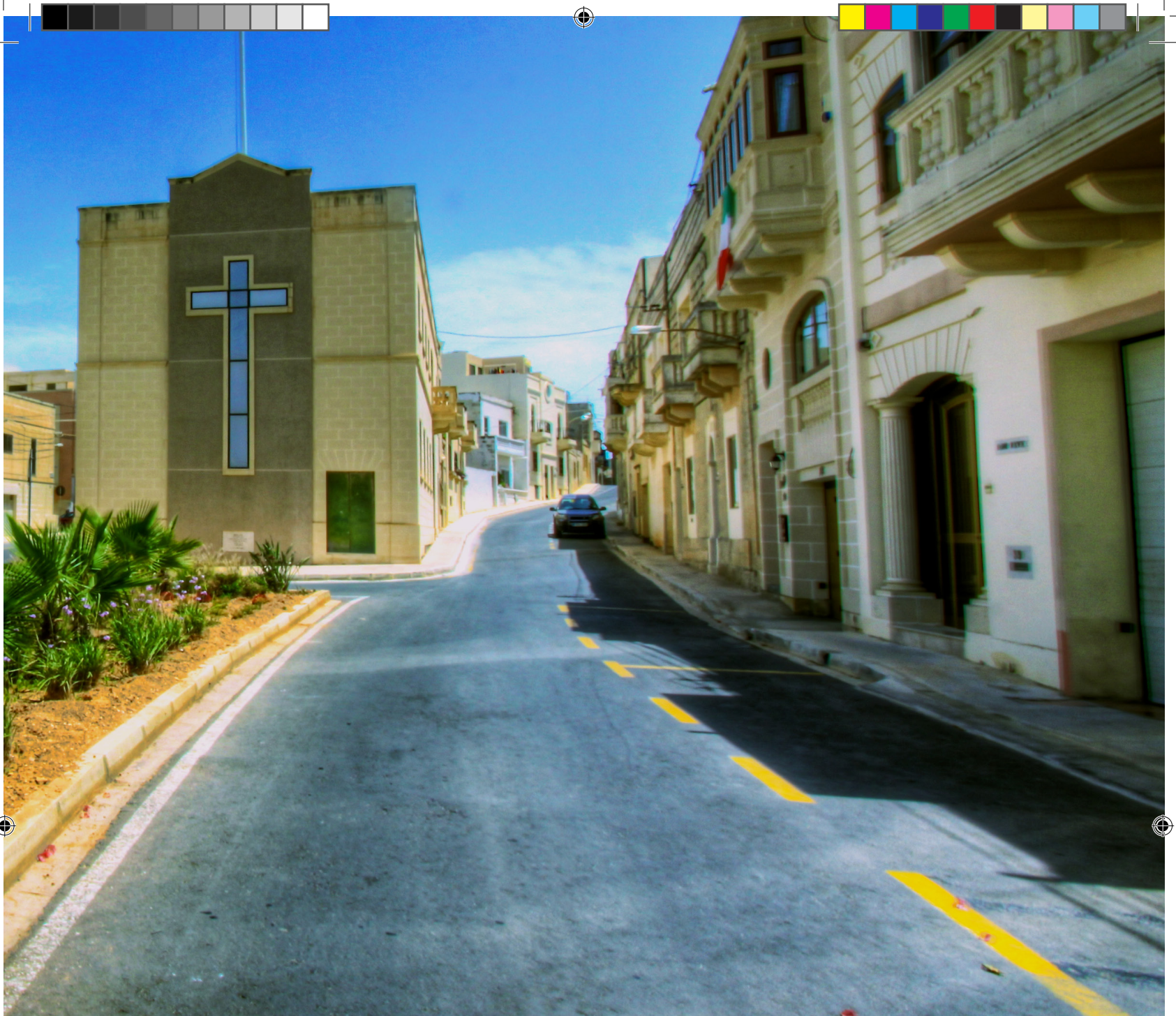
- » The incandescent lamps shall be replaced with energy saving compact fluorescent lamps. Currently there are sixteen incandescent lamps with the total annual consumption of 622.68 kWh which is equivalent to €126.40. If these are replaced with energy saving compact fluorescent lamps 18W the total annual consumption will be reduced by €69.53 per year. The cost to substitute the incandescent lamps with energy saving compact fluorescent lamps would be approximately €130 and when compared to the €69.53 savings per year, the payback period will be less than 2 years.
- » Motion detectors shall be considered in particular areas such as the public convenience cubicles. This will eliminate the possibility of leaving the lights on for long period of time even when the building is unoccupied. On the other hand the common area of the public convenience shall be equipped with light level sensor to light up automatically.
- » The only single fluorescent T8 shall in the long term be replaced with T5 and with electronic ballast.
- » In the executive secretary's office and the small office adjacent to the latter at first floor level due to the high level of lux the halogen lamps shall be eliminated whilst the four halogen lamps in the secretary office shall be replaced with compact fluorescent lamps. Eliminating and replacing these lamps will result in an annual energy saving of approximately 168kWh.
- » The split type air conditioning units shall be replaced with a Variable refrigerant flow system (VRF) which consists of a number of air handling units connected to a single external condensing unit, and allow refrigerant flow to be varied using either an inverter controlled variable speed compressor, or multiple compressors of varying capacity in response to changes in the cooling or heating requirements within the air conditioned space. Obviously this will require a relatively amount of capital cost but which will imply a much efficient with regards to energy consumption and a much more environmental friendly system.
- » On the other hand in the short term, these units shall be maintained on a regular basis and such maintenance programme shall include the cleaning of the indoor filters, cleaning of outdoor units and checking of gas charge. Moreover the improvement of the external envelope of the building, thus reducing the U-value primarily of the balconies and roof as shown in the tables below, will imply less use of the air conditioning units for comfort and thus less energy consumption. The simple installation of a 50mm polyurethane insulation in the two balconies will imply a total energy saving of 263kWh per year.
- » If a solar film is installed on the balcony windows (being in an Urban Conservation Area, a prior approval from the Malta Environment and Planning Authority has to be sought) it is assumed that the above savings can be doubled. The installation of such solar films will imply a capital cost of around €250 per balcony with an assumed payback period of around eight to ten years.
- » Moreover separating the balconies from the adjacent offices, thus creating an unconditioned space in the balcony will further reduce the heat energy transfer which in turn will increase the annual energy consumption by means of air conditioning. The latter can easily be done in the Mayor's office but very difficult to separate the balcony from the office of the executive secretary due to space limitations.
- » The bitumen waterproofing membrane installed on the roof of the building is black in colour and hence by simply painting the membrane with a reflective colour such as white or even silver will reduce the solar gain and hence reduce the air conditioning load.
- » The installation of insulation on the false ceiling of the Mayor's office will again reduce the heat transfer to the building from the roof.
- » The water dispenser is the most energy consuming item in the above table. This is normally left switched on even when the building is unoccupied. Therefore it is hereby being suggested that a timer switch is installed to shut down the water dispenser outside normal office hours and this may well reduce the consumption by around 50% equivalent to approximately 140kWh.
- » Currently the local council is in the process of awarding the tender for the supply and installation of a PV system which we assume will be in the region of 2kW power system. This will yield around 3,200 kWh of energy which is equivalent to 25.6% of the total annual energy consumption of the building.

## Conclusion

The objective of this energy audit of the Dingli local council building and of the public conveniences underneath was to identify the energy use, patterns and the various opportunities for the reduction of wastage of

energy. Hence this report is a feasibility study which will eventually lead to the implementation of the energy management programme by the Dingli Local Council.





## Chapter 10

# National Minimum Requirements on Energy Performance for the New Proposed Civic Centre, Dingli

Jonathan Scerri, Econing Engineering Consultancy Ltd.



## Preamble

The Dingli Local Council acknowledges that although the buildings discussed in this section fall under the jurisdiction of and are owned by the Government of Malta, they are not vacant as they are presently lease to third-party tenants. In this light, the Local Council has

decided not to prejudice any of the rights tenants enjoy today. This project will only be carried out when, and if, tenements become vacant and eventually devolved the Local Council.

## 1.0 Introduction

With global increase in the energy prices and the onset of global warming, the member states of the European Union are committed to improve the energy performance of buildings. As a result, the European Commission has developed the Energy Performance of Buildings Directive (Directive 2002/91/EC). The Directive is transposed in Malta by the Energy Performance of Buildings Regulations, 2008 (LN 261/2008).

The mentioned regulations, under sub regulation 5(1) refer to the National Minimum Requirements on the Energy Performance of Buildings as set out in the Government Gazette by Government Notice No. 1002 of 2006, referred to as Technical Guidance Document F on the Conservation of Fuel, Energy and Natural Resources published by the Services Division of the Building Regulations Office.

The building being analysed is a proposed renovation of an existing building to serve as a New Civic Centre for the locality of Dingli and is located at Triq il-Kbira, corner with Dahlet is-Sienja and Triq il-MUSEUM, Dingli. It is originally a residential building and the proposed renovation includes the construction of an additional floor.

**Figure 10.1: New Proposed Civic Centre, Dingli**



## 2.0 Scope

This report consists of an assessment of compliance with the relevant chapters of Technical Guidance Document F dealing with the thermal performance of the building envelope, namely, Resistance to the Passage of Heat (Section 2) and Solar Overheating (Section 3). The

building shall be taken in a worst case scenario of a "desert context". This exercise fulfils the requirements of Legal Notice 261 of 2008.

This report is not an energy audit report.

## 3.0 Compliance Requirements

### 3.1 Resistance to the Passage of Heat

Technical Guidance Document F requires that in relation to the Resistance to the Passage of Heat (Section 2), the envelope of all buildings shall be designed to resist heat loss or gain or, where appropriate, to encourage heat loss or gain.

This is achieved by limiting the heat transfer properties of the building fabric structure, particularly by setting maximum values for the overall heat transfer coefficient, hereafter referred to as U-Value,

for particular building elements and limiting the aggregate area for windows and roof lights as a percentage of the area of the exposed building elements.

The maximum limits of heat transfer coefficient are summarised in Table F.1 of Technical Guidance Document F, reproduced below for ease of reference.

**Table 10.1: F.1 of Technical Guidance Document F**

Building Element	Maximum U-Value (W/m <sup>2</sup> K)
Exposed Walls	1.57
Exposed Floors	1.57
Non-Exposed Floors	1.97
Roofs	0.59

In accordance with Table F.2 of Technical Guidance Document F, offices and places of assembly may have a maximum of 25% of the aggregate area of exposed walls bounding the building as glazing having a U-Value of 5.8W/m<sup>2</sup>K or better.

However, *Clause 2.04.3* allows a design flexibility such that if the U-values of the exposed elements in Table F.1 are improved, then the maximum aggregate glazing requirements can be adjusted to reflect such values provided that the aggregate heat loss of the whole building shall be no greater than if the trade-off had not been applied. In practice, however, the design criteria for solar overheating would nevertheless limit the aggregate area of glazing irrespective of meeting the criteria for heat transfer through the building fabric.

### 3.2 Solar Overheating

To satisfy the requirements of Technical Guidance Document F in relation to Solar Overheating (Section 3), it is required in *Clause 3.01.1* that:

In designing a building the designer shall take into account all relevant factors so that:

- » Occupied spaces or buildings that rely on natural ventilation do not overheat when these are subject to a moderate level of internal heat gain.

## 4.0 Methodology

### 4.1 Units

Throughout this report, unless otherwise stated, SI units have been used. The term "azimuth" in this report refers to the angle of direction around the horizon measured in a clockwise direction with the North direction as the origin.

### 4.2 Estimation of Resistance to the Passage of Heat from Walls

It is proposed that the existing building is refurbished for use as a Civic Centre by Dingli Local Council, retaining most of the external envelope, excluding aperture enclosures, as found.

- » Spaces or buildings that incorporate mechanical ventilation or cooling do not require excessive cooling plant capacity to maintain the desired space comfort conditions.

These requirements shall be met by:

- » The appropriate specification of the building envelope especially area and type of glazing and the surface finishes to be used,
- » The incorporation of passive measures such as external shading, and
- » The use of high thermal capacity combined with day and night ventilation.

This document shall demonstrate whether the area of glazing after taking into account the effect of passive measures, complies with the requirements of Table F.4 of Technical Guidance Document F, reproduced below for ease of reference.

**Table 10.2: F.4 of Technical Guidance Document F**

Orientation of Opening	Maximum Allowable Area of Opening (%)
N	25
S	20
NE	17
E/SE/SW/NW	12
W	9
Horizontal (Roof lights)	7

Wherever the building does not comply with Table F.4, it shall be demonstrated whether passive measures such as external shading (wingwalls and overhangs) as required in *Clause 3.01.1* shall cause these requirements to be met.

Since the precise cross sectional details of walls are not available, worst case conditions of solid limestone walls have been assumed. In practice, any cavities whether void or backfilled with screed shall increase the thermal resistance of the envelope. It is very likely that the existing thick walls contain such cavities that are either backfilled or hollow.

In view of the fact that all exposed building envelope elements contribute to the passage of heat, the overall exposed area shall be considered rather than the elevation area. As an approximation, the internal perimeter of each level is multiplied by the height of each storey measured from the inside of the building as required by *Clause 2.02.1(iii)* of Technical Guidance Document F, to provide the exposed area of each level.



In conformity with *Clause 2.02.1(iii)*, any external door with more than 1m<sup>2</sup> of glazing shall be considered as a window.

The external building envelope is composed of sections of either of two wall thicknesses, namely, 0.23m (9") solid limestone and an average of 0.80m (32") which, as explained above, is also assumed to be a worst case construction of solid limestone.

It shall be assumed that wall constructions are as follows:

- » **0.23m thick wall:** single leaf of soft limestone (franka) of density 1700kg/m<sup>3</sup> and thermal conductivity of 1.1W/mK, rendered on the

inside with 6mm of lightweight plaster of density 600kg/m<sup>3</sup> and thermal conductivity of 0.18W/mK;

- » **0.80m thick wall:** multiple leaves of soft limestone (franka) of density 1700kg/m<sup>3</sup> and thermal conductivity of 1.1W/mK, assumed to contain no cavities, rendered on the inside with 6mm of lightweight plaster of density 600kg/m<sup>3</sup> and thermal conductivity of 0.18W/mK.

The coefficients of heat transfer for each type of wall shall be calculated as follows:

**Table 10.3: For 0.23m Thick Wall made of Soft Limestone:**

Layer	Material	Thickness (m)	Thermal Conductivity (W/mK)	Thermal Resistance (m <sup>2</sup> K/W)
---	External Surface Resistance	---	---	0.060
1	Single Leaf Soft Limestone	0.23	1.1	0.209
2	Lightweight Plaster Rendering	0.006	0.18	0.033
---	Internal Surface Resistance	---	---	0.100
Total Thermal Resistance, RT				0.402

$$U = \frac{1}{R_T} = \frac{1}{0.402 \text{ m}^2\text{K/W}} = 2.486 \text{ W/m}^2\text{K}$$

**Table 10.4: For 0.80m Thick Wall made of Soft Limestone (assumed solid):**

Layer	Material	Thickness (m)	Thermal Conductivity (W/mK)	Thermal Resistance (m <sup>2</sup> K/W)
---	External Surface Resistance	---	---	0.060
1	Multiple Leaves of Soft Limestone	0.80	1.1	0.727
2	Lightweight Plaster Rendering	0.006	0.18	0.033
---	Internal Surface Resistance	---	---	0.100
Total Thermal Resistance, RT				0.920

$$U = \frac{1}{R_T} = \frac{1}{0.920 \text{ m}^2\text{K/W}} = 1.087 \text{ W/m}^2\text{K}$$

### 4.3 Resistance to the Passage of Heat from Roofs

Since details of the roof build-up are also not available, following the site survey, it shall be assumed that two types of roof structures are employed in this building, namely:

- » **Traditional stone slab roof:** Single lower layer of soft limestone (franka) of density 1700kg/m<sup>3</sup> and thermal conductivity of 1.1W/mK, bare on the inside, covered with a 50mm topping of limestone

screed (torba) of density 1300kg/m<sup>3</sup> and thermal conductivity of 0.8W/mK, topped with a 50mm of hard screed layer of density 2000kg/m<sup>3</sup> with a thermal conductivity of 0.41W/mK, a 50mm retrofitted polyurethane insulation layer and finished with 10mm ceramic tile of density 2300kg/m<sup>3</sup> with a thermal conductivity of 1.3W/mK;

- » **Cast in-situ Concrete Roof:** A finishing gypsum false ceiling layer of density 900kg/m<sup>3</sup> and thermal conductivity of 0.25W/mK, an

air gap between the gypsum ceiling and concrete layer, a cast in-situ reinforced concrete layer of density 2300kg/m<sup>3</sup> and thermal conductivity of 2.3W/mK, a 50mm polyurethane insulation layer, an average of 50mm limestone screed (torba) of density 1300kg/m<sup>3</sup>

laid to falls and a 50mm concrete topping (kontrabejt) of density 1200kg/m<sup>3</sup>.

The coefficients of heat transfer for each type of roof shall be calculated as follows:

**Table 10.5: For Traditional Stone Slab Roof**

Layer	Material	Thickness (m)	Thermal Conductivity (W/mK)	Thermal Resistance (m <sup>2</sup> K/W)
---	Internal Surface Resistance	---	---	0.140
1	Single Leaf Soft Limestone	0.150	1.1	0.136
2	Limestone Screed	0.050	0.8	0.063
3	Hard Screed	0.050	1.35	0.037
4	Polyurethane Insulation	0.050	0.025	2.000
5	Ceramic Tile	0.010	1.3	0.008
---	External Surface Resistance	---	---	0.040
Total Thermal Resistance, RT				2.424

$$U = \frac{1}{R_T} = \frac{1}{2.424 \text{ m}^2\text{K/W}} = 0.413 \text{ W/m}^2\text{K}$$

**Table 10.6: For Cast in-situ Concrete Roof:**

Layer	Material	Thickness (m)	Thermal Conductivity (W/mK)	Thermal Resistance (m <sup>2</sup> K/W)
---	Internal Surface Resistance	---	---	0.140
1	Gypsum Plasterboard False Ceiling	0.012	0.25	0.048
2	Air Gap	---	---	0.250
3	Reinforced Concrete	0.180	2.30	0.078
4	Polyurethane Insulation	0.050	0.025	2.000
5	Limestone Screed	0.050	0.8	0.094
6	Concrete Topping	0.050	0.41	0.122
---	External Surface Resistance	---	---	0.040
Total Thermal Resistance, RT				2.772

$$U = \frac{1}{R_T} = \frac{1}{2.772 \text{ m}^2\text{K/W}} = 0.36 \text{ W/m}^2\text{K}$$

## 4.4 Estimation of the Risk of Solar Overheating

The building shall be taken in a desert context. This is a worst case scenario as, in practice, adjacent buildings shall cast shadows on parts of the building under examination during various times of the day. The actual solar gain by radiation and the risk of solar overheating shall, in actual fact, be reduced.

For analysis purposes, the building shall be divided into a number of façades (elevations) of different orientations and the horizontal rooftop.

The orientation for each vertical surface shall be measured from plans. For linear interpolation purposes for orientations falling in between compass orientations indicated in Table F.4 of Technical Guidance Document F, the following formula shall be employed:

$$p = \left[ \left( \frac{\theta - \theta_1}{\theta_2 - \theta_1} \right) \times (p_2 - p_1) \right] + p_1$$

where,

$p$  is the allowable percentage glazing for the orientation examined

$p_1$  is the allowable percentage glazing for the nearest given lower azimuth

$p_2$  is the allowable percentage glazing for the nearest given higher azimuth

$\theta$  is the azimuth of the surface examined

$\theta_1$  is the nearest lower azimuth specified in Table F.4

$\theta_2$  is the nearest higher azimuth specified in Table F.4

For each elevation, apertures dimensions have been measured during a site survey. Details of aperture enclosure materials and presence, if any, of shading elements have been recorded.

The elevation frontage area shall be used in estimating the gross area for each façade as the area of wingwalls and other perpendicular structures does not contribute to heat gain by solar radiation.

### 4.4.1 Glazing Area vs Gross Area

A frame factor of 0.7 shall be applied to the gross aperture area. This is in conformity with Table 3 – Frame Factors for Windows and Doors of the Technical Manual of the Energy Performance of Residential Dwellings in Malta, for timber frames.

### 4.4.2 Correction Factor for Blinds

A correction factor of 0.95 shall be used for glazing/blind combination as specified in Table F.4 of Technical Guidance Document F.

### 4.4.3 Overhangs (Horizontal Shading Elements)

Wherever overhangs from overlying balconies or terraces or any other overhang specifically designed to reduce solar gain are present above apertures in the elevation examined, an overhang solar shading factor shall be introduced.

A shading factor of 0 indicates perfect shading (no solar gain) and a shading factor of 1 indicates no shading. In practice, any shading element shall provide a shading factor anywhere between 0 and 1 depending on the orientation of the receiver and the position of the sun. Where no overhang is present, a shading factor of 1 shall be used.

This overhang solar shading factor shall be calculated using dedicated software produced by Sustainable by Design Ltd, Seattle, US. Calculations shall be performed on a monthly average basis with simulations calculated per hour. The month of June yields the lowest shading factor for overhangs due to increased shading as a result of the high elevation of the sun. Nevertheless, the average monthly shading factor for the month of August has been selected as this month exhibits the highest mean outdoor temperature and hence the highest risk of solar overheating.

### 4.4.4 Wingwalls (Vertical Shading Elements)

In the case of wingwalls, or any other structure providing solar shading from the sides of the apertures, a wingwall solar shading factor shall be introduced.

Correspondingly as for overhangs, a shading factor of 0 indicates perfect shading (no solar gain) and a shading factor of 1 indicates no shading. In practice, any shading element shall provide a shading factor anywhere between 0 and 1 depending on the orientation of the receiver and the position of the sun. Where no wingwall is present, a shading factor of 1 shall be used.

Wingwall shading factors shall be calculated using own proprietary developed software that takes into account the latitude of the location (36°N for the Maltese islands), orientation of the receiver (azimuth measured from due North), the characteristic dimensions of the receiver, the offset of the wingwall(s) from the receiver and the depth of the wingwall(s) under consideration.

Calculations are simulated every 15 minutes between sunrise and sunset. Since the azimuth of the sun does not vary significantly during the summer months, in coherence with the overhang shading factor, the wingwall shading factor for the month of August has been selected as this month poses the highest risk for internal solar overheating as this month exhibits the highest mean outdoor temperature.

Where wingwalls are present on both sides of the aperture, a comprehensive overall wingwall shading factor is automatically computed and inserted in the calculation tables.

In cases where both wingwalls and overhangs provide shading to an aperture, the product of the two separate shading factors shall be used in calculation tables for glazing equivalent area analysis.

## 5.0 Building Analysis

The building shall consist of three levels (excluding the roof level), namely:

- » Ground Floor Level (Level 0) serving as a reception area for the Dingli Local Council, a Police Station, an exhibition space and a Polyclinic,
- » First Floor Level (Level 1) serving as Local Council Offices and a Public Library, and
- » Second Floor (Level 2) serving as Mayor's Office and Board Room.

having a U-Value of 5.8W/m<sup>2</sup>K or better is allowed. The maximum U-Value permitted for exposed walls is 1.57W/m<sup>2</sup>K. Therefore the maximum allowed weighted average U-Value for walls is equal to:

$$\bar{U} = \frac{\sum UA}{\sum A} = \frac{(0.25 \times 5.8) + (0.75 \times 1.57)}{1} = 2.628 \text{ W/m}^2\text{K}$$

For roofs, a maximum of 10% of the aggregate area of exposed area bounding the building as glazing having a U-Value of 5.8W/m<sup>2</sup>K or better is allowed. The maximum U-Value permitted for exposed roofs is 0.59W/m<sup>2</sup>K. Therefore the maximum allowed weighted average U-Value is equal to:

$$\bar{U} = \frac{\sum UA}{\sum A} = \frac{(0.1 \times 5.8) + (0.9 \times 0.59)}{1} = 1.111 \text{ W/m}^2\text{K}$$

### 5.1 Acceptance Criteria for Resistance to the Passage of Heat

Since the building is used as an office block, a maximum of 25% of the aggregate area of exposed walls bounding the building as glazing

#### 5.1.1 Resistance to the Passage of Heat

The walls of the main building are made up of two thicknesses

**Table 10.7: Thickness of the walls of the main building**

Wall Thickness (m)	Total Gross Surface Area (m <sup>2</sup> )	Glazing Area (m <sup>2</sup> )	Wall Net Internal Surface Area (m <sup>2</sup> )	Wall U-Value (W/m <sup>2</sup> K)
0.80	277.00	29.45	247.55	1.087
0.30	295.40	38.25	257.19	2.486

For double glazed aluminium framed apertures with a 12mm air filled cavity, the U-Value is equal to 3.7W/m<sup>2</sup>K. The overall glazing area for the building envelope (walls) is 67.7m<sup>2</sup>. Consequently, the weighted average U-Value is equal to:

$$\bar{U} = \frac{\sum UA}{\sum A} = \frac{(247.55 \times 1.087) + (257.19 \times 2.486) + (67.7 \times 3.7)}{(247.55 \times 257.19 \times 67.7)} = 2.025 \text{ W/m}^2\text{K}$$

Therefore, the compliance criteria for resistance to the passage of heat from walls are achieved.

**Table 10.8: Compliance criteria for resistance to the passage of heat from walls**

Roof Type (m)	Total Gross Surface Area (m <sup>2</sup> )	Glazing Area (m <sup>2</sup> )	Roof Net Surface Area (m <sup>2</sup> )	Roof U-Value (W/m <sup>2</sup> K)
Stone Slabs	173.60	0	173.60	0.413
Cast Concrete	91.60	3.38	88.22	0.36

For double glazed aluminium framed apertures with a 12mm air filled cavity, the U-Value is equal to 3.7W/m<sup>2</sup>K. The skylight area is 3.38m<sup>2</sup>.

Therefore the overall weighted average U-Value is equal to:

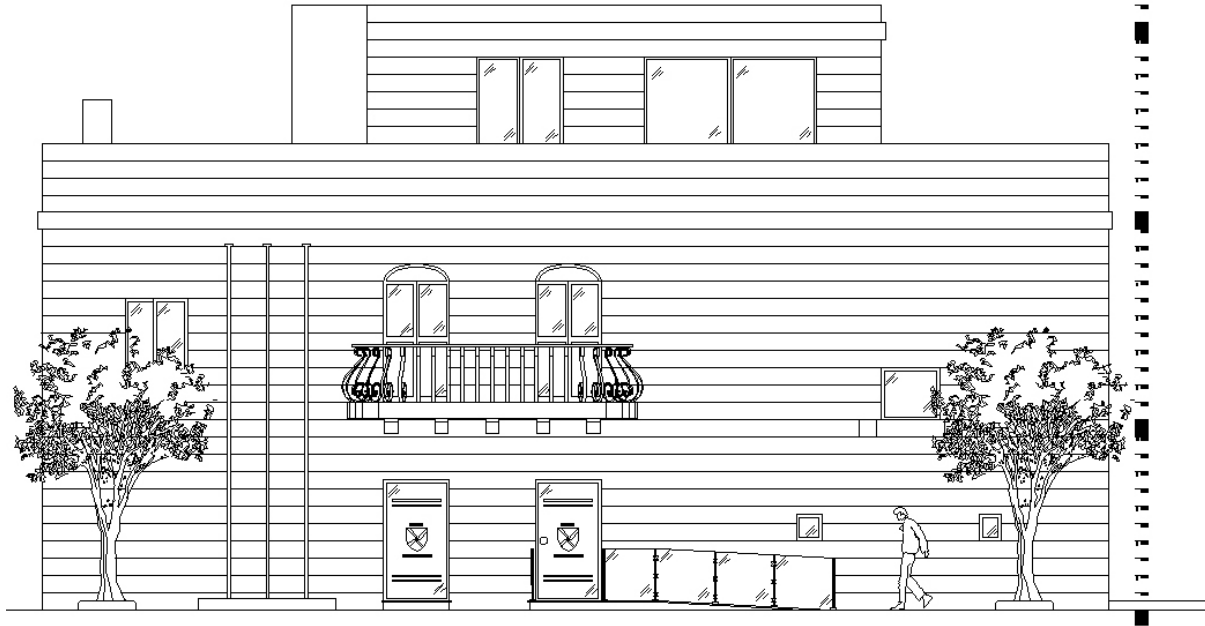
$$\bar{U} = \frac{\sum UA}{\sum A} = \frac{(173.6 \times 0.43) + (88.2 \times 0.36) + (3.4 \times 3.7)}{(173.6 \times 91.6)} = 0.438 \text{ W/m}^2\text{K}$$

This means that the roof shall comply with the acceptance criteria for resistance to the passage of heat, provided that a 50mm polyurethane insulation (and waterproofing) layer is installed all over the building.

## 5.2 Solar Overheating Analysis

### Front Elevation (B-B: Triq il-Kbira): Characteristics

Figure 10.2: Proposed Elevation B-B



#### PROPOSED ELEVATION B-B

The azimuth of the front elevation is 288°.

From Table F.4 of Technical Guidance Document F, the nearest defined azimuths are W (270°) and NW (315°) with allowable percentage areas of 9% and 12% respectively.

By interpolation, the percentage allowed glazing for an azimuth of 288° is given by:

$$p = \left[ \left( \frac{288^\circ - 270^\circ}{315^\circ - 270^\circ} \right) \times (12\% - 9\%) \right] + 9\% = 10.20\%$$

The gross elevation area for the front facade is 164.4m<sup>2</sup>. Therefore the maximum allowable area of glazing shall be 16.78m<sup>2</sup>.

#### Front Elevation: Glazed Apertures

The following glazed aperture types have been identified for the front elevation:

- » 2 main doors with an area of 2.39m<sup>2</sup> each,
- » 1 small window with an area of 0.20m<sup>2</sup>,
- » 1 small window with an area of 0.17m<sup>2</sup>,
- » 1 windows with an area of 1.38m<sup>2</sup>,
- » 1 windows with an area of 0.91m<sup>2</sup>,

- » 2 balcony doors with an area of 2.66m<sup>2</sup> each,
- » 1 glazed door with an area of 4.05m<sup>2</sup>,
- » 1 glazed door with an area of 8.100m<sup>2</sup>.

#### Front Elevation: Analysis

The gross glazing area for the front elevation is equal to 24.91m<sup>2</sup>. The equivalent glazing area after applying all factors that reduce heat gain by solar radiation, namely, shading elements (overhangs and wingwalls), frame factor (where applicable) and blinds is equal to 18.73m<sup>2</sup>.

Detailed inputs and results can be seen in Appendix 1.

The equivalent glazing area exceeds the maximum allowable glazing area.

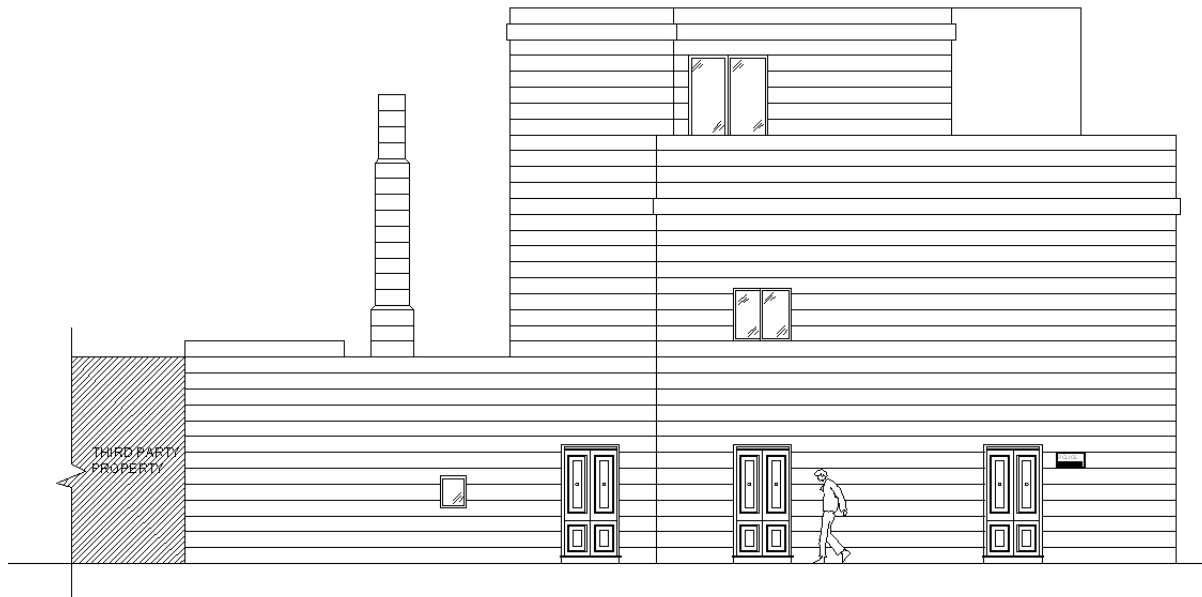
Therefore, the front elevation fails to meet the compliance criteria for solar overheating. A number of recommendations that may be adopted to achieve the acceptance criteria are available in the relevant chapter.

### Side Elevation (A-A: Daħlet is-Sienja): Characteristics

From Table F.4 of Technical Guidance Document F, the nearest defined azimuths are N (0°) and NE (45°) with allowable percentage areas of 25% and 17% respectively.

The azimuth of the side elevation in Dahlet is-Sienja is 25°.

**Figure 10.3: Proposed Elevation A-A**



**PROPOSED ELEVATION A-A**

By interpolation, the percentage allowed glazing for an azimuth of 25° is given by:

$$p = \left[ \left( \frac{25^\circ - 0^\circ}{45^\circ - 0^\circ} \right) \times (17\% - 25\%) \right] + 25\% = 20.56\%$$

The gross elevation area for the side façade is 140.5m<sup>2</sup>. Therefore the maximum allowable area of glazing shall be 28.88m<sup>2</sup>.

#### Side Elevation (Daħlet is-Sienja): Glazed Apertures

The following glazed aperture types have been identified for the side elevation in Dahlet is-Sienja:

- » 3 doors having an area of 2.31m<sup>2</sup> each,
- » 1 small window with an area of 0.30m<sup>2</sup>,

- » 1 window having an area of 1.11m<sup>2</sup>,
- » 1 door having an area of 4.06m<sup>2</sup>.

#### Side Elevation (Daħlet is-Sienja): Analysis

The gross glazing area for the side elevation is equal to 12.40m<sup>2</sup>. The equivalent glazing area after applying all factors that reduce heat gain by solar radiation, namely, frame factor (where applicable) and blinds is equal to 9.42m<sup>2</sup>.

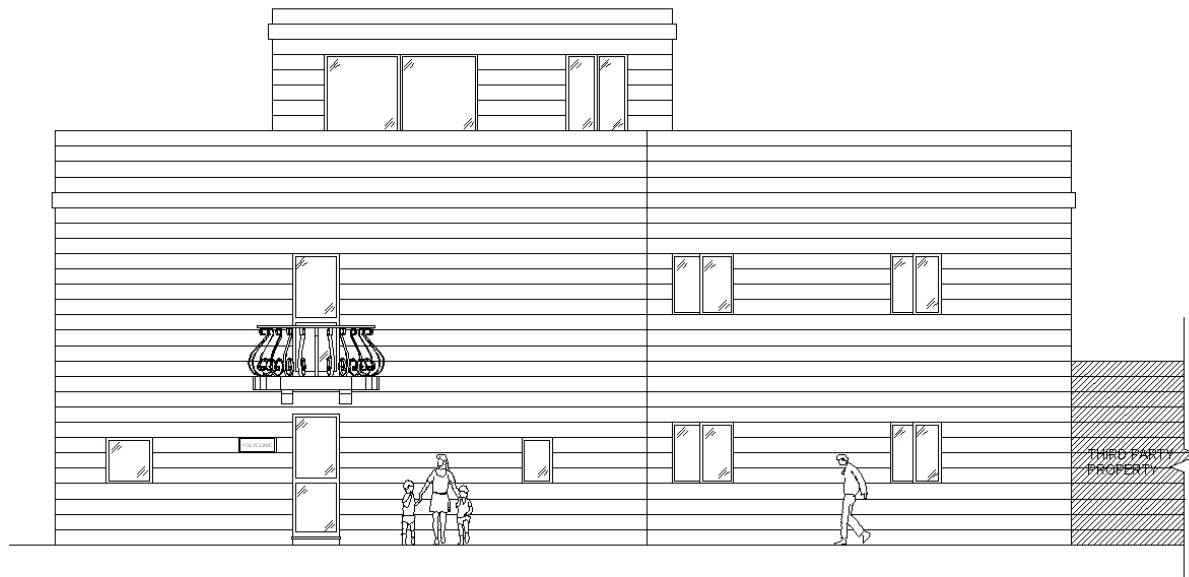
Detailed inputs and results can be seen in Appendix 1.

The equivalent glazing area is less than the maximum allowable glazing area.

Therefore, the side elevation in Dahlet is-Sienja meets the compliance criteria for solar overheating.

## Side Elevation (C-C: Triq il-MUSEUM): Characteristics

Figure 10.4: Proposed Elevation C-C



PROPOSED ELEVATION C-C

The azimuth of the side elevation in Triq il-MUSEUM is 204°.

From Table F.4 of Technical Guidance Document F, the nearest defined azimuths are S (180°) and SW (225°) with allowable percentage areas of 20% and 12% respectively.

By interpolation, the percentage allowed glazing for an azimuth of 204° is given by:

$$p = \left[ \left( \frac{204^\circ - 180^\circ}{225^\circ - 180^\circ} \right) \times (12\% - 20\%) \right] + 20\% = 15.73\%$$

The gross elevation area for the side elevation in Triq il-MUSEUM is 165.4m<sup>2</sup>. Therefore the maximum allowable area of glazing shall be 26.02m<sup>2</sup>.

### Side Elevation (Triq il-MUSEUM): Glazed Apertures

The following glazed aperture types have been identified for the side elevation in Triq il-MUSEUM:

- » 2 doors (one leading to balcony) having an area of 2.18m<sup>2</sup> each,
- » 1 windows with an area of 0.81m<sup>2</sup>,
- » 1 window with an area of 0.54m<sup>2</sup>,
- » 2 windows having an area of 1.44m<sup>2</sup> each,

- » 2 windows having an area of 1.20m<sup>2</sup> each,

- » 1 glazed door with an area of 8.10m<sup>2</sup>,

- » 1 glazed door with an area of 3.24m<sup>2</sup>.

### Side Elevation (Triq il-MUSEUM): Analysis

The gross glazing area for the rear elevation is equal to 22.33m<sup>2</sup>. The equivalent glazing area after applying all factors that reduce heat gain by solar radiation, namely, frame factor (where applicable) and blinds is equal to 16.97m<sup>2</sup>.

Detailed inputs and results can be seen in Appendix 1.

The equivalent glazing area is less than the maximum allowable glazing area.

Therefore, the side elevation in Triq il-MUSEUM meets the compliance criteria for solar overheating.

### Roof: Characteristics

The roof has a gross area of 270m<sup>2</sup> of which 3.38m<sup>2</sup> is occupied by a skylight. This is equivalent to 1.25% of the roof area. Table F.4 of Technical Guidance Document F allows up to 7% of the horizontal exposed area to be glazed. Therefore the roof of the building, as proposed, complies with the criteria for solar overheating.

## 6.0 Executive Summary

It is to be noted that the proposed building is a conversion of an existing building. Therefore, it is to be expected that a number of non conformances exist.

Nevertheless, the proposed building shall, in fact, fully comply with the National Minimum Requirements for Energy Performance of Buildings with some minor adjustments.

The tables below summarises the findings of this analysis with regards to resistance to the passage of heat. The calculated weighted average U-Values are based on the assumption that a 50mm polyurethane insulation layer is applied on all roofs as detailed in the relevant chapter of this report.

**Table 10.9: Resistance to the passage of heat**

Exposed Surface	Gross Area (m <sup>2</sup> )	Glazing Area (m <sup>2</sup> )	Maximum Allowed U-Value (W/m <sup>2</sup> K)	Weighted Average U-Value (W/m <sup>2</sup> K)	Acceptance Criteria
Walls	572.4	67.7	2.628	2.025	Pass
Roof	265.2	3.38	1.111	0.438	Pass

Only one façade, the front elevation, slightly exceeds the acceptance criteria for solar overheating, mainly due to the large glazed surfaces at the second floor.

The table below summarises the results of the analysis for the risk of solar overheating.

**Table 10.10: Risk of solar overheating**

Elevation	Gross Area	Glazing Allowed %	Maximum Permitted Area	Actual Glazing Area	Equivalent Glazing Area	Acceptance Criteria
Front (B-B)	164.4	10.20	16.78	24.91	18.73	Fail*
Side (A-A)	140.5	20.56	28.88	12.40	9.42	Pass
Side (C-C)	165.4	15.73	26.02	22.33	16.97	Pass
Roof	270.00	7.00	18.90	3.38	3.38	Pass

\*Refer to Recommendations Section of this report

## 7.0 Recommendations

### 7.1 Resistance to the Passage of Heat

Although the building, as proposed, complies fully to the National Minimum Requirements for Energy Performance of Buildings, the following recommendation shall help reduce energy consumption. Their economical feasibility is, however, beyond the scope of this report.

- » Coating of the roof finished layer with a solar reflective paint to reduce heat gain by radiation.

### 7.2 Risk of Solar Overheating

Only the front elevation fails to meet the compliance criteria of Technical Guidance Document F with respect to the risk of solar overheating. This is mainly due to the large glazed apertures in the second floor.

The following recommendations may be employed for this elevation to meet the acceptance criteria. Applying such measures to other elevations, also helps in reducing the solar heat gain and the risk of solar overheating, in general.

Such measures shall contribute to a reduction in the energy consumption and running cost of the building. A feasibility study of the implementation of these recommendations is outside the scope of this report.

Introduce Passive Shading such as overhangs (horizontal shading) and wingwalls (vertical shading) as post fitted options or constructional features,

Application Solar Control Films on Glazing (subject to approval by MEPA),



Rendering some glazing opaque or translucent by applying a Film Coating, particularly for the glazed full height apertures, where solar radiation transmission may be reduced without affecting the overall design aesthetics of the building,

Introduction of Active Solar Shading Systems that can be withdrawn during the winter months to make maximum use of solar heat gain when required,

Use of PVC-U or wooden apertures to decrease the frame factor and reduce the thermal conductivity.

Any of the above improvements will cause a revision of the actual equivalent glazing area by reducing either the shading coefficients or the glass transmittance factor. The results as represented in Appendix 1 will require re-evaluation in order to determine the degree of improvement.

## Appendix 1

### Building Glazing Area Results

#### Glazing Area Analysis

Elevation Identification:	Side B-B	Surface Azimuth:	288 °
Gross Area:	164.4 m <sup>2</sup>	Allowed Glazing Area:	16.78 m <sup>2</sup>

**Table 10.11: Aperture Equivalent Area Calculations:**

Aperture Type	Quantity	Unit Gross Area	Total Gross Area	Frame Factor	Overhang Shading Factor	Wingwall Shading Factor	Blinds Factor	Glass Transmittance Factor	Unit Equivalent Area	Total Equivalent Area
A	2	2.39	4.78	0.8	1	1	0.95	1	1.82	3.63
B	1	0.2	0.2	0.8	0.29	1	0.95	1	0.04	0.04
C	1	0.17	0.17	0.8	0.29	1	0.95	1	0.04	0.04
D	1	1.38	1.38	0.8	1	1	0.95	1	1.05	1.05
E	2	2.66	5.32	0.8	1	1	0.95	1	2.02	4.04
F	1	0.91	0.91	0.8	1	1	0.95	1	0.69	0.69
G	1	4.05	4.05	0.8	1	1	0.95	1	3.08	3.08
H	1	8.1	8.1	0.8	1	1	0.95	1	6.16	6.16
Total Gross Glazing Area (m2):			24.91	Total Elevation Equivalent Glazing Area (m2):						18.73

**Table 10.12: Overhang Shading Factor Inputs:**

Aperture Type	Height	Overhang Spacing	Overhang Depth	Shading Factor (August)
B	0.45	0	0.45	0.29
C	0.45	0	0.45	0.29

## Glazing Area Analysis

Elevation Identification:	Side A-A	Surface Azimuth:	25 °
Gross Area:	140.5 m <sup>2</sup>	Allowed Glazing Area:	28.88 m <sup>2</sup>

## Aperture Equivalent Area Calculations:

Aperture Type	Quantity	Unit Gross Area	Total Gross Area	Frame Factor	Overhang Shading Factor	Wingwall Shading Factor	Blinds Factor	Glass Transmittance Factor	Unit Equivalent Area	Total Equivalent Area
A	3	2.31	6.93	0.8	1	1	0.95	1	1.76	5.27
B	1	0.3	0.3	0.8	1	1	0.95	1	0.23	0.23
C	1	1.11	1.11	0.8	1	1	0.95	1	0.84	0.84
D	1	4.06	4.06	0.8	1	1	0.95	1	3.09	3.09
Total Gross Glazing Area (m <sup>2</sup> ):		12.40	Total Elevation Equivalent Glazing Area (m <sup>2</sup> ):							9.42

## Glazing Area Analysis

Elevation Identification:	Side C-C	Surface Azimuth:	204 °
Gross Area:	165.4 m <sup>2</sup>	Allowed Glazing Area:	26.02 m <sup>2</sup>

## Aperture Equivalent Area Calculations:

Aperture Type	Quantity	Unit Gross Area	Total Gross Area	Frame Factor	Overhang Shading Factor	Wingwall Shading Factor	Blinds Factor	Glass Transmittance Factor	Unit Equivalent Area	Total Equivalent Area
A	2	2.18	4.36	0.8	1	1	0.95	1	1.66	3.31
B	1	0.81	0.81	0.8	1	1	0.95	1	0.62	0.62
C	1	0.54	0.54	0.8	1	1	0.95	1	0.41	0.41
D	2	1.44	2.88	0.8	1	1	0.95	1	1.09	2.19
E	2	1.20	2.4	0.8	1	1	0.95	1	0.91	1.82
F	1	8.10	8.1	0.8	1	1	0.95	1	6.16	6.16
G	1	3.24	3.24	0.8	1	1	0.95	1	2.46	2.46
Total Gross Glazing Area (m <sup>2</sup> ):		22.33	Total Elevation Equivalent Glazing Area (m <sup>2</sup> ):							16.97







Chapter 11

# Energy Audit for Public Areas in the Locality of Dingli

Jonathan Scerri, Econing Engineering Consultancy Ltd.



## Introduction

The Dingli Local Council intends to take a pro-active approach at a local level in dealing with climate change. For this reason, it has commissioned Econing Engineering Consultancy Ltd. to carry out an energy audit of public areas in the locality including public gardens and recreational areas and the provision of energy for street lighting purposes.

In addition, it has requested Econing Engineering Consultancy to evaluate the possibility of using renewable energy sources for providing energy for such purposes.

## Executive Summary

Street lighting is, by far, the heaviest consumer of energy in public areas. Although, presently, the local council is not responsible for payments of street lighting energy consumption, it has asked that the street lighting energy requirements are evaluated within the scope of this report. This is in line with the council's aim of achieving sustainable energy within the locality. For this reason, besides an inventory of the street lighting fittings installed, this report includes not less than seven proposals that can reduce or offset the street lighting energy requirement in the locality.

energy requirements have been evaluated together with those of the street lighting system.

This energy audit has also evaluated the master plans for three other public areas that are being considered for embellishment or development. These include the embellishment of the landscaping in Misrah il-Mafkar, the development of the area adjacent to the football ground bound by Triq il-Mediterran and Triq Ġuże` Ellul Mercer, and the redevelopment of the area bound by Triq Ghar Bittija and Triq Dun Karm Azzopardi.

There are two principal public gardens in Dingli, namely, Ġnien il-Familja, which is provided with a separate energy meter billed to the local council and Ġnien il-Ħaddiem which is currently connected to the street lighting network. The energy requirements of Ġnien il-Familja have been evaluated separately. On the other hand, since lighting in Ġnien il-Ħaddiem is connected to the street lighting network, its

For each of these three proposed projects, discussions have been undertaken with the designing architects whereby proposals for energy conservation and renewable energy, where applicable, have been put forward.

## Street Lighting

### Present Situation

Although a detailed inventory of street lighting fittings is not available, survey maps showing installed street lighting equipment were used to identify and quantify the stock of street lighting fittings. In addition, the local council identified a number of new street lighting fittings which are not yet marked on the survey maps.

80W. These units shall be banned from use in the EU by 2015. For the purpose of energy estimation, all lamps have been assumed to be sodium lamps, unless they could be identified from the survey maps or at the site visit.

Street lighting is centrally controlled by means of photoelectric cells installed on substation buildings. These are preset to switch on at a set light level and switch back off when the light level exceeds a threshold plus an amount of hysteresis to prevent frequent switching during twilight conditions.

Pedestrian crossing are equipped with a 70W metal halide lamp together with a Belisha beacon containing a 60W incandescent lamp. Due to its intermittent flashing operation, it is assumed that the incandescent lamp consumes an average of 30W.

It is estimated that the street lighting operates for 4,320 hours annually.

A number of decorative free standing lighting poles with globes or lanterns are equipped with energy saving compact fluorescent lamps. It has been assumed that these lamps are rated at 11W each.

Most of the street lighting stock is made up of high pressure tubular sodium lamps (with a characteristic yellow colour) of nominal power consumption of 70W. A number of higher wattage lamps has been observed during a site visit but their exact quantities could not be established.

Two floodlights connected to the street lighting circuits contain 400W high pressure sodium lamps.

Although being gradually phased out, it is estimated that around 5% of all installed lamps are still high pressure mercury vapour lamps (with a characteristic white colour) of nominal power consumption of

From the above source, the stock of street lighting fittings in the locality amounts to 417 units divided as shown in the table below. The same nomenclature appearing in the street lighting survey map has been used to identify the type of fittings.

Where applicable, an allowance for the power consumption of control gear has been included as indicated by nominal power consumption of such control gear by reputable manufacturers.

**Table 11.1: Estimate Of Energy Consumption For Street Lighting In The Locality**

Type	Number of Fittings	Nominal Power Consumption (W)	Power Consumption Including Control Gear (W)	Estimated Annual Energy Consumption (kWh)
L	188	70	77	62536
M	12	80	88	4652
W	143	70	77	47568
Z	7	100	100	3024
S	5	70	77	1663
C	4	70	77	1330
Y	24	70	77	7983
R	2	3 x 11	33	285
F	2	400	440	3802
Others	2	4 x 11	44	760
New	28	70	77	9314
<b>TOTAL</b>	<b>417</b>			<b>142,917</b>

Concisely, it is estimated that the locality consumed 142,917 kWh of electrical energy for street lighting purposes annually. It is estimated that this contributes to an annual CO<sub>2</sub> emission of 129 tonnes.

Although, to date, the local council is not responsible for payments of street lighting energy consumption, in order to attribute a commercial value to the above energy consumption, it has been assumed that the cost of electricity is equivalent to an average non-residential tariff of € 0.203/kWh.

Therefore, the hypothetical cost of street lighting energy consumption for the locality would amount to € 29,035 annually. This excludes the cost of maintenance on the system.

## Proposals

Although, as previously stated, the local council is not responsible for the cost of street lighting energy, the local council is aware of its responsibility to promote sustainable energy in the locality and to reduce the locality's contribution to emissions and climate change.

This report aims to identify a number of proposals that can reduce the energy consumption by street lighting.

### 1. Replacement of Remaining Mercury Vapour Lamps by High Pressure Sodium Lamps.

It is proposed that an exercise shall be carried out by the council's maintenance contractor to replace all remaining mercury vapour lamps (with a characteristic white colour) with more efficient high pressure sodium lamps of equivalent light output.

Estimated Annual Energy Savings: 20 lamps x (80W – 70W) x 4320 h = 864 kWh

**Figure 11.1: Illustration presence of mercury vapour lamps in the locality**



### 2. Installation of LED Beacons and Floodlights on Pedestrian Crossings.

Only seven pedestrian crossing lights have been identified in the locality. For this reason, the capital outlay to replace the metal halide lamps with LED floodlights should not be too large. Although the energy savings from such an improvement are not huge, one should observe that, due to the extended lifetime of LED lighting, maintenance costs should be reduced significantly. Payback on the capital cost shall be outweighed by the energy and maintenance savings throughout the lifetime of the replacement floodlights.

Estimated Annual Energy Savings: 7 x (100W – 35W) x 4320 h = 1966 kWh



### 3. Replacement of HPS Floodlight in front of Parish Church by LED Floodlight.

The floodlights installed in front of the Parish Church façade is being proposed to be replaced by a LED floodlight of equivalent power output. The colour rendering of LED lighting would be far superior to that of the present lighting, thereby enhancing the appearance of the church building. Similar to the benefits of proposal 2, above, payback on the capital cost shall be outweighed by the energy and maintenance savings throughout the lifetime of the replacement floodlight.

Estimated Annual Energy Savings:  $1 \times (440W - 100W) \times 4320 \text{ h} = 1469 \text{ kWh}$

### 4. Upgrade of Lighting in Ġnien il-Ħaddiem

Lighting in Ġnien il-Ħaddiem is currently by means of twelve, mushroom type luminaires, containing mercury vapour lamps. Replacement of such units by decorative LED or Compact Fluorescent lighting, possibly as a part of an embellishment project, can reduce the energy consumption of this area.

Presently, lighting is switched together with the street lighting circuits. For this reason, lights remain functional, throughout the night, even when the garden is not in use.

Installing a timer on the circuit to switch off garden lighting after closing time, shall reduce further the energy consumption.

The estimated annual energy savings calculation below assumes the use of 18W compact fluorescent lighting to replace the existing mercury vapour lamps together with the use of a timer. Since the proposed timer shall reduce the illumination hours, the use of LED lighting cannot be justified at the present cost of such units.

Present Annual Energy Consumption:  $12 \times 88W \times 4320 \text{ h} = 4562 \text{ kWh}$

Proposed Annual Energy Consumption:  $12 \times 18 \times 2000 \text{ h} = 432 \text{ kWh}$

Estimated Annual Energy Savings:  $4562 - 432 \text{ kWh} = 4130 \text{ kWh}$

### 5. Use of Intelligent Street Lighting or Adaptive Street Lighting for the locality

The central government has already included, as a part of Energy Management Measures in its National Strategy for Policy and Abatement Measures Relating to the Reduction of Greenhouse Gas Emission, measures to reduce the energy consumption by street lighting for arterial roads as from 2010. National implementation of street lighting dimming technology is to be completed by 2015.

As a consequence, following the central government's pilot study, the local council can implement similar technology for the locality.

Various technologies exist and may be implemented. These range from centralized dimming equipment, installed in substations and controlling all street lighting circuits, to individual lamp control systems, whereby the intensity of each lamp can be controlled arbitrarily by a pre-programmed system and an astronomical clock.

Such intelligent or adaptive street lighting technology could provide up to 30% energy savings using the existing luminaires and distribution

infrastructure. The local council should remain aware of all developments in such technology and their implementation so that it can proceed to put into practice within the locality when it deems it to be economically feasible.

At present, these technologies are developing fast and it would be too ambitious to estimate the cost of their implementation. The estimated annual energy savings calculation below, assumes that 30% energy saving is achievable on high pressure sodium lamps installations.

Estimated Annual Energy Savings:  $30\% \times 120,180 \text{ kWh} = 36,324 \text{ kWh}$

In addition to the energy savings, one must also consider the extended life of the lamps when operated at reduced intensity. Such extension of useable life would decrease the maintenance costs of the street lighting in the locality as this technology may be applied to the majority of the light fittings installed.

### 6. Implementation of a Street Lighting Policy

It is recommended that the council shall make it its policy that before authorizing new street lighting fittings, the local council commissions a lighting level study to establish whether additional street lights are required. In this way, the decision on the adequacy of the existing street lighting system is performed in a scientific manner. This would omit the possibility of installing unnecessary additional street lights at the request of individuals in the locality.

The energy savings from such a measure cannot be quantified.

### 7. Renewable Energy for Street Lighting

It is also possible to offset an amount of energy used for street lighting by implementing renewable energy technology. Using renewable energy for direct powering of street lighting would require the use of energy storage batteries as the time availability of renewable energy resource is not compatible with the demand. Such systems are very expensive, both in capital cost and in maintenance costs.

In order to reduce the cost of such systems, it is proposed that any renewable energy installed specifically for street lighting purposes would be connected to the grid infrastructure. In this way, the energy produced during day-time is exported to the grid to be purchase back when required during night time. This omits the need for batteries and their associated expenses.

The local council would be required to identify areas suitable for installation of renewable energy technologies. Such systems often require large areas. However, the use of rooftops of public buildings has already been earmarked by the central government for renewable energy use.

The general public associates the use of renewable energy for street lighting purposes with photovoltaic panels installed on each lamp fitting. It would also be required to erect information boards to explain to the general public how the system concept of energy export and buy-back of energy operates. In this way, the local council can increase the public awareness on the use of renewable energy which would not be so evident with the proposed grid connected configuration.

Energy savings from such systems depend on the amount of investment available, the space available and the technology to be implemented.

## Energy Savings

The following table summarizes the energy saving possibilities for street lighting as detailed in the proposals above.

Although, the majority of the savings can be achieved by the implementation of Intelligent or Adaptive Street lighting technology, which is also the most expensive proposal, significant energy and emission reduction possibilities exist with the more modest improvements.

By implementing the first four proposals, it is possible to reduce energy consumption for street lighting by almost 6%, this being equivalent to 8,429 kWh and 7.59 tons of CO<sub>2</sub> emissions.

Further energy savings or energy consumption offset may be achieved by implementing renewable energy technologies specifically intended for street lighting purposes.

**Table 11.2: Summary Of Street Lighting Energy Saving Proposals**

Proposal		Estimated Annual Energy Savings (%)	Estimated Annual Energy Savings (kWh)	Estimated Annual CO2 Reduction (tons)
1	Replacement of Mercury Vapour Lamps	0.60	864	0.78
2	Upgrade of Pedestrian Crossing Lighting	1.38	1,966	1.77
3	Replacement of Parish Church Floodlighting	1.03	1,469	1.32
4	Upgrade of Lighting in Ġnien il-Ħaddiem	2.89	4,130	3.72
5	Implement Intelligent or Adaptive Street Lighting Technology	25.42	36,324	32.69
TOTAL		31.31	44,753	40.28

## Comparison with Enemalta Street Lighting Consumption Records

At the time of this energy audit, Enemalta Corporation could not provide accurate readings of annual street lighting energy consumption. Their indication was that the annual street lighting energy consumption in the locality amounts to "approximately 300,000 kWh". This estimation has been based on readings taken by Enemalta Corporation in the period from 2006 to 2008.

This value of street lighting energy consumption is grossly distant from the estimation carried out in this report. It is equivalent to around 210% of the street lighting energy requirements for the locality of Dingli.

The additional consumption may be attributed to a number of causes which are listed below. Since Enemalta's estimation is significantly higher than expected, a number of the following possible causes for the increased energy consumption warrant further investigation.

Possible causes for increased street lighting energy consumption include:

- » Errors in Enemalta street lighting metering and data collection resulting in an overestimation of the actual street lighting consumption,
- » Installation of lamps of higher wattage than required and specified on existing street lighting network,

- » Street lighting control system may be inadequately set for ambient light levels or faulty, rendering the street lighting operational when not required,
- » Authorised connections to the street lighting network by Enemalta Corporation for particular events such as, but not limited to, the village feast celebration period and/or Christmas street decorative lighting, for which the metered units have not been subtracted from the street lighting energy consumption,
- » Unauthorised third party street lighting connected to the public network,
- » Unauthorised third party electrical connections on the street lighting network.

It is advised that a thorough survey of connections to the existing street lighting network be carried out to identify the extent, if any, of the above mentioned possibilities that may be causing additional unnecessary energy consumption on the street lighting network.

## Ġnien il-Familja

Ġnien il-Familja is a recently developed public garden in the locality. It is located in a semi-circular area bounded by Triq il-Hemda, Triq Sir William Reid and Triq F. Zammit.

Energy requirements for this public garden is under the direct responsibility of the local council. Lighting is provided by means of 14 wide-beam indirect (reflected) illumination poles of nominal rating of 250W each, together with 29 recessed, wall mounted path lights fitted with compact fluorescent lamps rated at 11W each. There is also a building within the precincts of this public garden that is mainly used as a store. One fountain pump is in operation in this public area.

It is evident that there has been a conscious selection of lighting fittings in order to conserve energy and maintain low requirements for this area. Notwithstanding, there is always rooms for improvement.

Lighting is operated by means of a timer system for five hours daily during winter months and two hours daily during summer months. The fountain pump is operated for two hours daily in the summer months and occasionally in winter, to prevent damage. Lighting and power within the buildings is used scarcely. A nominal amount of energy has been allowed for this purpose.

The table below, outlines the expected energy consumption for this public garden as it is being operated presently.

**Table 11.3: Summary Of Expected Energy Consumption In Ġnien Il-Familja**

Equipment	Number of Units	Power Rating (W)	Total Power (W)	Estimated Annual Running Hours (h)	Estimated Annual Energy Consumption (kWh)
Light Poles	14	250	3500	1170	4,095
Path Lights	29	11	319	1170	373
Fountain Pump	1	375	375	320	120
Stores Lighting and Power	N/A	N/A	N/A	N/A	100
TOTAL					4,688

**Figure 11.2: Energy consumption in Ġnien il-Familja**



Since all electricity bills produced for this garden are based on estimates, it was found out that their computation is somewhat conservative and may be based on a period when consumption was extremely low at an average of around 0.54 kWh/day. This value is too low to be taken as a representative energy consumption measurement.

Using the calculation above, it is estimated that the average daily energy consumption for this garden is around 12.8 kWh/day, amounting to a total of 4,688 kWh annually.

This is very close to the projected annual consumption of 4,394 kWh averaged as 12.0 kWh/day as indicated in the energy bill dated 6<sup>th</sup> November, 2009. However, with the data available, it has not been

possible to identify and verify the actual measurement period as the preceding bills included estimated consumption rather than actual metered units.

### Proposals

Since this public garden has recently been redeveloped, it is unlikely that major upgrades shall be performed in the near future. However, a number of proposals are being made hereunder to be considered at varying timeframes as deemed appropriate by the local council. One significant proposal is that of installing a renewable energy system to provide part or all of the energy requirements for this garden. Alternative options are being presented for consideration.

#### 1. Replacement of Path Lights by LED Lighting.

The path lights installed, power by compact fluorescent lamps, are already considered as energy efficient lighting. However, the lifetime of such lighting is finite. Furthermore, it is expected that, due to their low level installation, the lifetime of these luminaires is in the order of 10 to 15 years. For this reason, this proposal is more likely to be adopted as the light fitting approach their end of life and are due for replacement.

The main function of these light fittings is to provide lighting for the pathways in the garden together with their decorative effect. By replacing the existing light fitting with 5W LED luminaires, it is possible to save as much as 55% of energy. Such proposed light

fittings shall provide the same lighting effect, with improved colour rendering (congruent to the colour rendering of the main pole lighting). Furthermore, since the lifetime of LEDs is excess of 15 years, it is likely that no maintenance associated with lamp replacement shall be required throughout the lifetime of the replacement fittings.

Estimated Annual Energy Savings:  $29 \times (11W - 5W) \times 1170 \text{ h} = 204 \text{ kWh}$

## 2. Installation of Renewable Energy System

The rooftop of the building within the garden is presently not being used. It is possible to install a renewable energy system intended to provide energy for use within the public garden.

Since most of the consumed energy is associated with lighting, there exists a situation where the energy produced during day-time may be required for use during the night. Furthermore, if a solar photovoltaic system is employed, the energy capture during summer time exceeds that during winter time. However, lighting is required for longer hours in winter when compared to summer.

In order to overcome the need of energy storage batteries, it is proposed that the renewable energy system is connected to the grid such that any generated surplus energy can be exported when not needed and bought back at other times.

Two renewable energy systems are possible for implementation in Ġnien il-Familja, namely photovoltaic energy or wind energy.

Photovoltaic energy may be preferred as it is less visually obtrusive and is silent in operation. Solar energy is also more predictable in terms of availability and expected yield.

With the technology presently available on the market, it is possible to install a 4 kWp photovoltaic system on the rooftop area available without much difficulty. A more detailed study and design would be required to establish the precise area available and installed power should the local council wish to make maximum use of the available area. However, a significant amount of energy can be captured with a system of such a ballpark size of photovoltaic system.

Estimated Annual Energy Produced:  $4 \text{ kWp} \times 1500 \text{ kWh/kWp} = 6,000 \text{ kWh}$

The above calculation accounts for a degree of maintenance factor and degradation factors over the lifetime of the photovoltaic system.

It can be seen that the proposed photovoltaic system results in being a net contributor to the grid. In this way, it could be claimed that the operation of Ġnien il-Familja would be Carbon Neutral.

This would result in the system being able to sell its surplus energy back into the grid at the applicable feed-in tariff rates. Besides eliminating energy costs, such a system would contribute to a minor income to the local council. Furthermore, the excess energy produced from this resource would also aid in slightly counteracting the emissions in the municipality.

Wind energy may, on the other hand, be preferred as it provides better visibility of the local councils initiative in favour of renewable energy. Furthermore, the council is already committed to install a photovoltaic

system within the locality. Using a different type of renewable energy may have the advantage of increase further public awareness.

It is possible to install a 2.5kW wind turbine instead of, or in conjunction with the solar photovoltaic system.

Estimated Annual Energy Produced:  $2.5 \text{ kW} \times 800 \text{ kWh/kW} = 2,000 \text{ kWh}$

At present, for the same annual energy capture, photovoltaic systems are cheaper to install and maintain than wind turbines.

Taking the average non-residential tariff of € 0.203/kWh, the following payback periods are applicable:

### Example 1: 4 kWp Photovoltaic System

Estimated Annual Energy Yield:	6,000 kWh
Estimated Annual Energy Consumption:	4,688 kWh
Annual Energy Savings:	4,688 kWh
Net Energy Contribution to the Grid:	1,312 kWh
Reduction in CO2 emissions:	5.4 tonnes
Annual Cost Savings:	€ 951.66
Annual Income from Surplus Energy:	€ 266.34 (assuming feed-in tariff at par with purchasing tariff)
Estimated Project Cost:	€ 16,000
Estimated Payback Period:	13 years (assuming no project incentives)

### Example 2: 2.5 kWp Photovoltaic System

Estimated Annual Energy Yield:	3,750 kWh
Estimated Annual Energy Consumption:	4,688 kWh
Annual Energy Savings:	3,750 kWh
Net Energy Contribution to the Grid:	N/A
Reduction in CO2 emissions:	3.4 tonnes
Annual Cost Savings:	€ 761.25
Annual Income from Surplus Energy:	N/A
Estimated Project Cost:	€ 11,000
Estimated Payback Period:	14 years (assuming no project incentives)

### Example 3: 2.5kW Wind Turbine

Estimated Annual Energy Yield:	2,200 kWh
Estimated Annual Energy Consumption:	4,688 kWh
Annual Energy Savings:	2,200 kWh
Net Energy Contribution to the Grid:	N/A
Reduction in CO2 emissions:	2.0 tonnes
Annual Cost Savings:	€ 446.60
Annual Income from Surplus Energy:	N/A
Estimated Project Cost:	€ 10,500
Estimated Payback Period:	24 years (assuming no project incentives)

Note that payback periods are calculated on simple return on investment without taking into account cost of financing if the project is debt financed. Furthermore, it is assumed that no energy incentive is availed of and all the funds for the project are issued from the council's accounts. Any financial aid would reduce the net project cost and hence the payback period.

In addition, it is assumed that the cost of energy shall remain constant through the lifetime of the project. If, on the other hand, the cost of conventional energy increases, the payback period would be reduced accordingly.

Furthermore, project costs are based on benchmark estimates of the cost of the particular technology per unit power produced. It may be possible that in a competitive bidding process, the local council may be able to obtain cheaper prices for the proposed renewable energy systems.

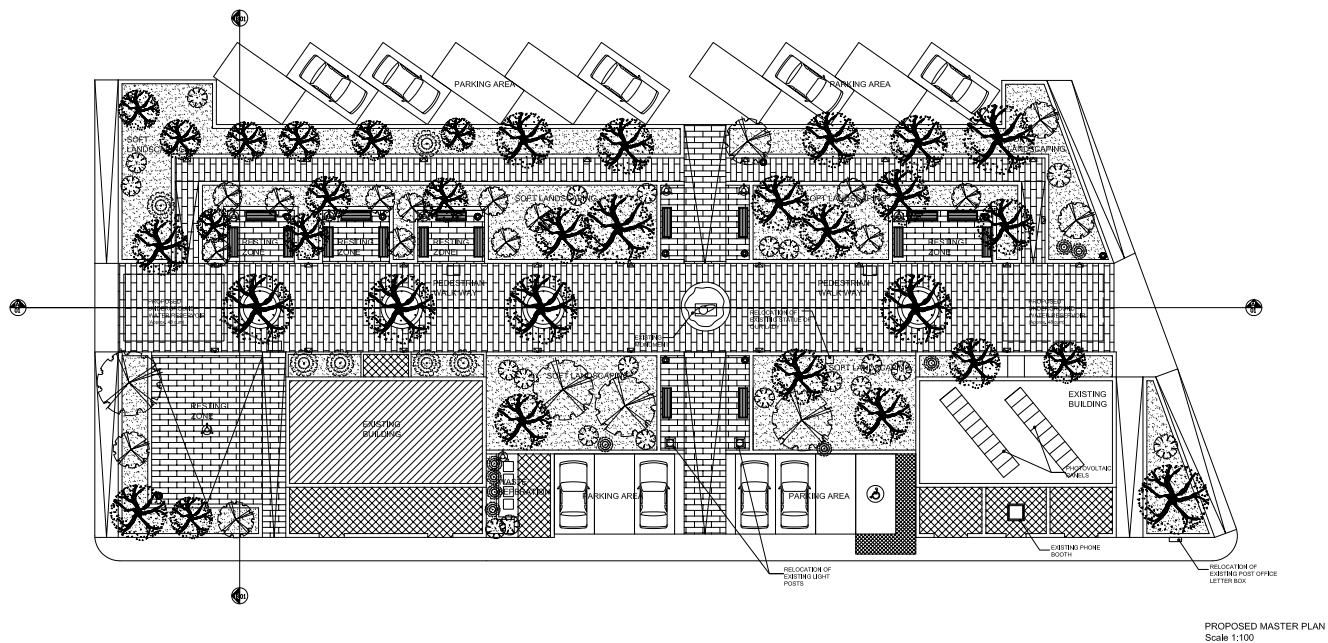
It is also assumed that no energy conservation measures are implemented and that the energy consumption of this public garden remains at its present level.

## New Development Proposals in Public Areas

### Embellishment of Misrah il-Mafkar

This project aims to redevelop an existing area known as Misrah il-Mafkar such that it can be better enjoyed by the general public whilst aiming to reach a higher level of sustainability.

Figure 11.3: Embellishment of Misrah il-Mafkar



The designing architects, namely mc<sup>2</sup>architects, have expressed their desire to reuse two large cast iron lamp posts currently lamped by three high pressure mercury vapour lamps each. It has been proposed that these lamp posts are refitted and re-lamped with compact fluorescent lighting (26W per lamp) for improved energy efficiency.

The main functional lighting of this area shall be by means of another eight lamp posts. It has been proposed that these lamp posts shall be of the indirect type, powered by ceramic metal halide lamps for improved energy efficiency and lighting efficacy. These lamps are available in a range of colour temperatures.

Accent and decorative lighting for pathway illumination within this area, has been proposed to comprise of twenty-seven path lights. Two efficient alternatives are currently available, that is, compact fluorescent lamps (11W per fitting) or LED lighting (5W per fitting). At present, the capital cost associated with LED lighting may be steep but one must bear in mind that such lighting has a very long lifetime and the reduction in maintenance costs together with the associated energy savings outweigh the capital expense throughout the lifetime of the fittings.

It has also been proposed that a 4kWp photovoltaic system is installed on one of the existing building rooftops. Depending on the final selection of lighting equipment and on the operating hours in practice after installation, it is very likely that this photovoltaic system produces a net surplus energy. This surplus energy can be used to offset the energy consumption in the other areas that are being

proposed for development and do not lend themselves suitable for such an installation.

### Development of Area Adjacent to Existing Football Pitch

Another area that has been earmarked for future development is the area bounded by the existing football pitch, Triq il-Mediterran and Triq Ġuże` Ellul Mercer. This area is presently a wasteland that is used as an unorganized parking space.

Lighting requirements for this area shall be met by means of twelve indirect type lamp posts together with two floodlights for the proposed car parking area and separated waste collection area.

Figure 11.4: Area Adjacent to Existing Football Pitch



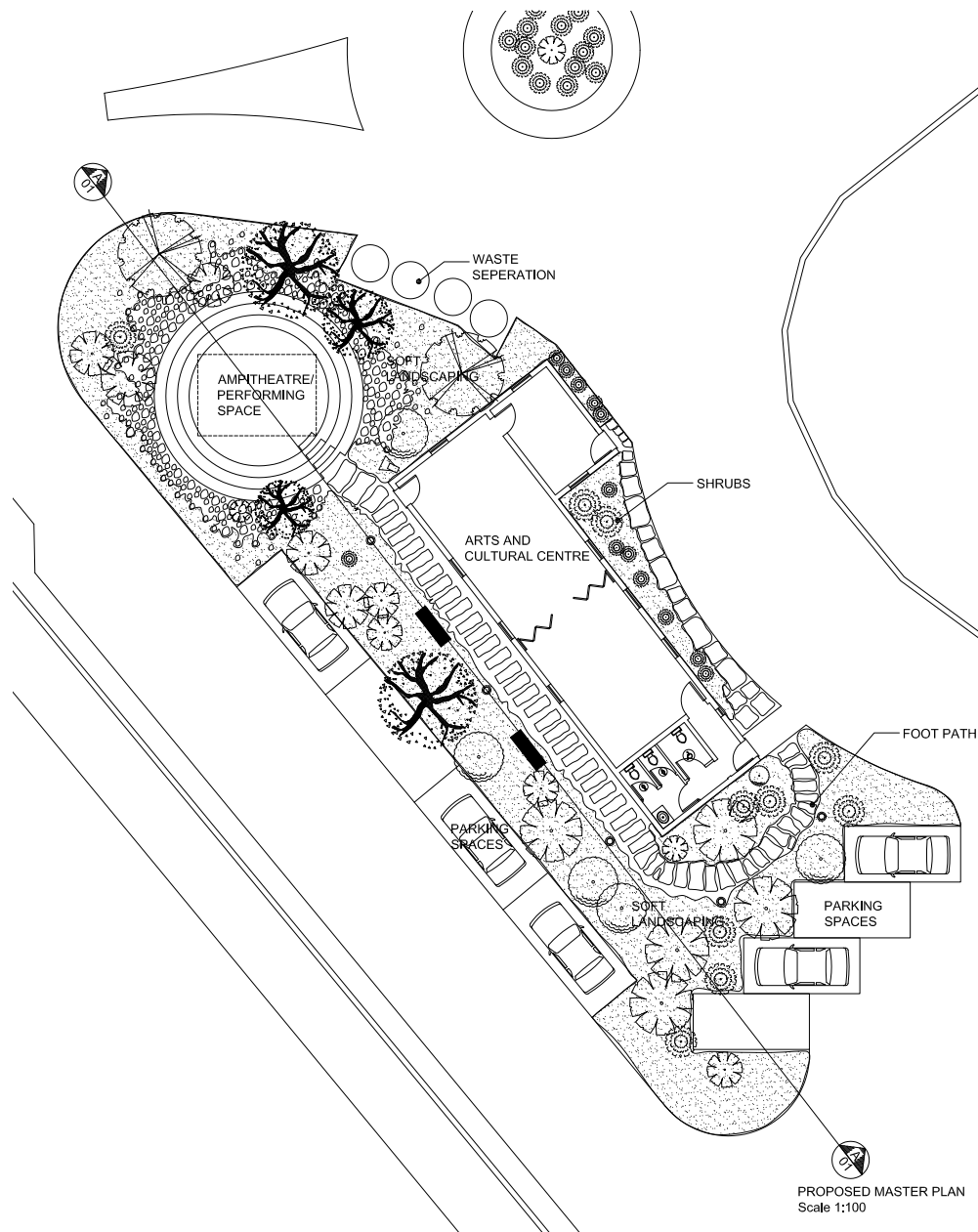
It has been proposed that the lamp posts shall be powered by ceramic metal halide lamps for improved energy efficiency and lighting efficacy. Floodlights may be either metal halide type or LED type.

In this area, since there shall be no buildings erected, it has been deemed unfeasible to install renewable energy systems. Any surplus energy generated from other proposed systems shall offset the energy requirements for this area. In this way, the overall energy sustainability of public recreational areas shall be maintained.

### Redevelopment of Area between Triq Ghar Bittija and Triq Dun Karm Azzopardi

It is being proposed that the area between Triq Ghar Bittija and Triq Dun Karm Azzopardi shall be redeveloped for public use. The existing building, currently used as a store, shall be used redeveloped into an Arts and Cultural Centre. The wasteland behind this building, next to the existing roundabout, shall be utilized as an Amphitheatre or Performing Space.

Figure 11.5: Area between Triq Ghar Bittija and Triq Dun Karm Azzopardi



Energy use in this area shall be for the purposes of external and internal lighting. Fluorescent lighting with T5 fittings complete with electronic ballast has been proposed for the indoor areas.

External lighting shall be by means of metal halide or LED floodlights together with a number of bollard lights along the pathway around the existing building.

The rooftop of the existing building may be used for the installation of a photovoltaic system. Since the energy requirements of this area are not known at this stage, the size of such a system cannot be reasonably proposed without some gross assumptions. Such a proposal may be duly detailed in due course when the usage patterns of this area can be established with some accuracy. However, given the ample size of the roof space available, it is likely that a system suitable to meet the anticipated energy requirements could be installed.

If hot water shall be provided in the lavatory sinks, this shall be provided by means of a small solar water heater. The installation of such a system shall be coordinated with that of any photovoltaic

system as both shall be competing for the same solar resource. Any electric backup heater shall be timer controlled to limit the hours of operation.

It has also been proposed to install a second class water system for use in the lavatories. Such system shall be fed from a purposely constructed water reservoir with a rain catchment from the existing building. In this way, the lavatories may be flushed by second class water rather than using fresh municipal water for this purpose. Since, in Malta, most of the fresh water requirements are met by desalination of sea water, such a water conservation measure shall, in turn, prove to be also a means of conserving energy.



## Conclusions

The potential for energy sustainability in public areas in this locality is evident. Furthermore, the proactive approach of the local council in favour of this cause is likely to yield measurable results towards this goal.

It is also apparent that sufficient funds need to be invested in order to achieve the desired targets. However, it must be taken into account, that besides the primary effect of reducing the energy requirements

for public areas and their associated emissions, any investment in this regard shall have a secondary effect of promoting energy sustainability among the citizens on the locality.

It is very likely that the process would be carried over into the private residences aiding to achieve the overall objective of rendering the locality of Dingli a truly sustainable locality.











## Chapter 12

# Sustainable Energy Action Plan

Jonathan Scerri, Econing Engineering Consultancy Ltd.





## 1. Introduction and General Information

**Figure 12.1: Geographical Location of Dingli**



The European Union, in its bid to lead the global fight against climate change has committed itself to reduce the overall emissions to at least 20% below 1990 levels by the year 2020. It has also acknowledged that local authorities have a key role to play in the achievement of the EU's energy and climate objectives.

**Figure 12.2: Covenant of Mayors Logo**



As a result, it has taken the initiative to establish the **Covenant of Mayors**. This is a process in which local authorities commit themselves voluntarily to reduce their CO<sub>2</sub> emissions beyond this 20% target.

To realize this commitment, each locality is producing and eventually implementing a Sustainable Energy Action Plan (SEAP). Such plan has to be prepared and completed within one year from the date of adhesion.

City  
**Had-Dingli**



<b>Mayor:</b>	Ian Borg
<b>Address:</b>	Dahlet is-Sienja DGL1880 Had-Dingli <a href="http://www.dingli.gov.mt">www.dingli.gov.mt</a>
<b>Inhabitants:</b>	3326
<b>Date of adhesion:</b>	2009-10-06
<b>Supporting Structures:</b>	Local Council's Association (Malta)
<b>Country:</b>	Malta

In this case, since the date of the adhesion for the locality of Dingli was the 6<sup>th</sup> day of October 2009, the Sustainable Energy Action Plan (SEAP) has to be completed within one year from this date i.e. by the end of September 2010.

As a basis for the SEAP, a Baseline Emissions Inventory (BEI) is prepared to provide knowledge of the entities contributing to CO<sub>2</sub> emissions in the locality's geographical area. The BEI shall also be used to identify and select appropriate actions and opportunities for reaching the locality's targets.

In future, in order to monitor progress of implementation of the actions within the SEAP, a Monitoring Emissions Inventory (MEI) shall be prepared to establish whether actions have been successful in reducing the overall emissions.

This SEAP must be envisaged as a key document illustrating how the Local Council shall reach its commitment by 2020. It defines concrete reduction measures which translate the long-term strategy into action and which shall have an effect on everyone including the private sector.

As described by the European Commission itself, these action plans shall include actions in the following sectors:

- » Built environment, including new buildings and major refurbishment;
- » Municipal infrastructure (district heating, public lighting, smart grids, etc);
- » Land use and urban planning;
- » Decentralised renewable energy sources;
- » Public and private transport policies and urban mobility;
- » Citizen and, in general, civil society participation;
- » Intelligent energy behaviour by citizens, consumers and businesses.

This Sustainable Energy Action Plan shall not be regarded as a rigid document. As circumstances change and as experience is gained through the ongoing implementation of actions, it may be useful to revise the plan. Furthermore, the plan establishes a strategy which is at least 10 years long. As a consequence, technological developments within the coming 10 year period are foreseen to be significant.

For this reason, it may make technical sense to revise the SEAP at least during its mid-term to include any actions or opportunities that may arise. The impacts of missing such opportunities may be significant and long lasting.

## 2. The National Situation

The Ministry for Resources and Rural Affairs has presented the National Strategy for Policy and Abatement Measures relating to the reduction of Greenhouse Gas emissions in September 2009.

The same national strategy underlines that a number of proposed actions require further study as it was not deemed possible or realistic that the published strategy document would be comprehensive in terms of the details and impacts of each policy or abatement measure considered.

Furthermore, it was emphasized that the proposed strategy is not absolute and immutable. As new challenges emerge and unforeseen opportunities arise, the strategy should be reviewed and reconsidered. This strategy for policy and abatement measures relating to the reduction of Greenhouse Gas emissions was based on the following building blocks:

**Figure 12.3: National Strategy building blocks**

Securing Civil Society and Citizen Participation			
Establishing an Industrial Framework for Climate Change and Building the Appropriate Human Capital			
Integrating the Economics of CLimate Change in Policy Design and the Identification of Abatement Measures			
Abatement Measures			
Energy	Waste and Agriculture	Water	Transport

In the same way, this Action Plan shall be seen as a dynamic document. It attempts to include those measures presented in the National Strategy that can be implemented at local level. Given the limited jurisdiction and budgets of Local Councils, many of such

actions shall require financial and administrative support of the Central Government.

This should not be a strenuous feat as such actions performed by the Local Council shall be in line with the national strategy and shall be deemed to be contributing to the achievement of the national targets.

As a part of the mentioned National Strategy, the country shall undergo a substantial investment in energy supply by considering the possibility of substituting present sources of energy by cleaner solutions. Since electricity production is the major source of CO<sub>2</sub> emissions, it is envisaged that any improvement in this regard shall contribute to an improvement in the National Emission Factor and as result reduce the locality's portion of CO<sub>2</sub> emissions.

In addition, as a part of the Energy Demand Management measures, it is expected that national measures such as the installation of smart utility meters, promotion of energy efficient appliances and the implementation of the EU Directive on the ban on incandescent lights shall also be a contributor to the overall reduction of the locality's energy requirements.

The implementation of the Energy Performance of Buildings Directive shall have a long term effect to reduce energy requirements of buildings in the locality. However, since the positive effects of this Directive are considered to be achievable over a number of years, it is unlikely that this shall have a measureable effect over the term of the Covenant of Mayors.

The national measures aimed to stimulate the penetration and use of renewable energy systems shall be looked upon closely by the Local Council. It shall attempt, as a part of this action plan, to help its citizens in tapping on the financial and technical resources made available by central government in the implementation of the National Strategy.

## 3. Political Commitment

The Dingli Local Council wants to create a healthy, thriving development with increasing concern for its environment and surrounding natural resources. As a result, it wants that all developments, in future, will be conducted with sustainability in mind.

The Dingli Local Council has already committed itself by adhering to the Covenant of Mayors since 6 October 2009. Furthermore, it has taken an active role by starting the Covenant of Mayors process. This Sustainable Energy Action Plan is a step in the right direction encouraging citizens to take the responsibility for their own part, however small, in conserving the environment. It aims to reduce climate change by reducing CO<sub>2</sub> emissions.

The Local Council is aware that to realize its ambitions to reduce the locality's impact on climate change it needs to encourage the reduction of use of fossil fuels and a challenging plan of actions is required to define its commitment to reducing CO<sub>2</sub> emissions.

The Local Council is also conscious that to achieve its overall target, it needs to involve all stakeholders in the process. Each citizen of the locality needs to be involved to participate in at least some of the actions of this plan. There may be several methods to secure public participation and this plan attempts to identify a number of possibilities.

It is evident that due to the limited administrative power of Local Councils in general, it shall have to rely on a number of actions that need to be implemented by the Central Government. Nevertheless, it shall do its utmost to lobby for the implementation of the necessary actions.

## 4. Baseline Emissions Inventory (BEI)

### 4.1 Selection of Baseline Year

Local Councils in Malta are a fairly recent political development. They have been established by Act of Parliament in 1993 (Act XV of 1993 – Local Councils Act). Prior to this development, Malta was considered as one political entity with statistical data being separated mainly according to the divisions of the two main islands, namely Malta and Gozo, of the Maltese archipelago.

For this reason, statistical data by locality is not readily available in all fields and, where available, it does not date back extensively. National statistical data has been published at locality level with some degree of detail in the National Census of 2005.

Consequently, it has been resolved that the furthest year for which the most comprehensive and reliable data can be collected is the year 2005. It is predicted, that future data at locality level will be accessible to a higher level of detail. Hence, Monitoring Emissions Inventories, to be presented in future, as committed in the Covenant of Mayors, may include adjustments and improvements in the accuracy of the emissions data at locality level.

### 4.2 Sources of Data

Data relating to municipal buildings, equipment and facilities, municipal fleet and municipal public lighting has been provided directly by the local council. Besides this direct data, the following primary sources of data have been consulted in the preparation of the Baseline Emissions Inventory:

- » National Statistics Office: Energy Consumption in Malta, 2000 – 2007.
- » National Statistics Office: Census of Population and Housing 2005, Volume 2: Dwellings.
- » National Statistics Office: Transport Statistics, 2005.

- » Malta Environment and Planning Authority: GHG Inventory for Malta, Common Reporting Format (CRF) Tables, Submission 2009, v1.3
- » National Greenhouse Gas Emissions Inventory Report for Malta, 1990-2007, March 2009.
- » Enemalta Corporation, Annual Report, 2005.
- » Water Services Corporation, Annual Report, 2005.
- » Energy Audit of Public Areas in the Locality of Dingli, 2010.

### 4.3 Availability of Data and Fields of Action

As stated in the Joint Research Committee (JRC) document named “Existing Methodologies and Tools for the Development and Implementation of SEAPs”, dated September 11, 2009, small municipalities usually have less data about energy consumption. This fact makes the baseline estimation more difficult.

For this reason, a level of proportioning of national data has been inevitable. However, extreme care has been taken such that the proportioning models are truly representative of the situation in the locality.

Consequently, the scope of the Baseline Emissions Inventory and eventually the Sustainable Energy Action Plan abide by the outcome of the JRC Workshop on Methodologies for Sustainable Energy Action Plans (SEAPs) under the Covenant of Mayors that has taken place in Ispra, Italy on May 18, 2009.

During this workshop, there has been a presentation entitled “Issues and Methods for Developing a SEAP for a small city”. The approach taken in the developing of this Baseline Emissions Inventory and Sustainable Energy Action Plan follows the guidelines mentioned in the presentation. The fields of action are stated below, identifying whether the local council has authority, competence and jurisdiction on the particular field.

**Table 12.1: SEAP Fields Of Action: Non Strictly On Energy, Identified By Local Council Competence**

Field of Action	Under Direct Local Council Jurisdiction	Emissions Inventory	Action Proposals	Reduction Commitment
Road Transport (Private and Commercial)	NO	YES	YES	NO
Public Transport	NO	YES	YES	NO
Municipal Fleet	YES	YES	YES	YES
Water Consumption	NO	YES	YES	NO
Others	NO	NO	YES	NO

**Table 12.2: Seap Fields Of Action: Strictly On Energy, Identified By Local Council Competence**

Field of Action	Under Direct Local Council Jurisdiction	Emissions Inventory	Action Proposals	Reduction Commitment
Municipal Buildings, Directly Managed or by Concession	YES	YES	YES	YES
Residential Buildings	NO	YES	YES	NO
Tertiary Buildings (Small Businesses, Shops, Repair Shops, etc.)	NO	YES	YES	NO
Municipal Public Lighting	NO	YES	YES	YES
Traffic Lights	NO	YES	YES	YES
Municipal Fleet	YES	YES	YES	YES
Others	NO	NO	YES	NO

For fields of action for which the local authority does not have jurisdiction, the action plan has been limited to an estimation of the baseline emissions, which is as accurate as far as reasonably practicable, together with proposals for action to reduce CO<sub>2</sub> emissions. No commitment on the amount of reduction can be justifiably made by the local council as it has no control whatsoever over these particular fields of action.

An exception to this rule is the fields of action relating to municipal public lighting. It is very likely that, during the course of the Covenant

of Mayors, that is, by the year 2020, the competence on public lighting excluding lighting of national arterial roads shall be de-centralised to be controlled by local councils. Should this not materialize, the local council shall, nevertheless, endeavour to implement the proposed actions to achieve the anticipated targets.

Where applicable, details on the methodology employed for proportioning of national data are available under the relevant subheadings in the next chapter.

## 5. Buildings, Equipment, Facilities and Industries

### 5.1 Municipal Buildings, Equipment and Facilities

The local council operates one office building in Dahlet is-Sienja. The electrical energy consumption for this building in the baseline year was equal to 12.47 MWh. Using the emission factor calculated for residential buildings (see below), this consumption contributes to an annual CO<sub>2</sub> emission of 10.81 tCO<sub>2</sub>.

In addition, the council is responsible for one other public recreational area known as Ġnien il-Familja. This area has an annual consumption of 4.69 MWh equivalent to 4.07 tCO<sub>2</sub>.

In total, the energy consumption for municipal buildings equipment and facilities, in the baseline year, is equal to 17.16 MWh. The associated CO<sub>2</sub> emissions add up to 14.88 tCO<sub>2</sub>.

**Table 12.3: Energy Consumption for Municipal buildings, equipment and facilities**

Building / Equipment / Facility	Energy Consumption (MWh)	CO <sub>2</sub> Emissions (tCO <sub>2</sub> )
Office Building	12.47	10.81
Ġnien il-Familja	4.69	4.07
Total Energy Consumption & Total CO <sub>2</sub> Emissions	17.16	14.88

### 5.2 Residential Buildings

Data for energy consumption in residential buildings at a local level was not available from the utility supplier. For this reason, a national proportioning method has been employed. A two dimensional matrix,

representing the types of dwellings by number of persons living in the dwelling and number of rooms has been created. A weighting factor for the number of persons and another weighting factor for the number of rooms, both relating to electricity consumption, have



been assigned. Similarly, a set of weighting factors has been assigned relating to fuel combustion in residential buildings.

The dwelling stock data used in the weighting matrix can be seen in Appendix 1.

### 5.2.1 Electricity

In the baseline year, 2005, a total of 2,260,762 MWh of electricity were generated in Malta. Fossil fuel used to generate this amount of electricity produced 1961.27 Gg of CO<sub>2</sub>. This value is based on the quantity reported in the National Greenhouse Gas Emission Inventory for Malta and the values therein have been calculated using standard emission factors in line with IPCC principles. As a result, the overall emission factor has been calculated to be equal to 0.867 tCO<sub>2</sub>/MWh.

Of the total electricity generated, 658,224 MWh have been used at a national level for domestic (residential) purposes. Using the two dimensional matrix model, as described above, 4,556.56 MWh can be attributed to electricity usage in residential buildings in the locality.

Applying the above calculated emission factor results in a CO<sub>2</sub> contribution of 3950.53 tCO<sub>2</sub> for the baseline year.

### 5.2.2 Liquefied Petroleum Gas (LPG)

A similar approach has been employed for the purpose of establishing the locality's contribution of fuel combustion in residential buildings.

The National Emissions Inventory for Malta, states that 99% of fuel combustion in residential buildings originates from the combustion of liquefied petroleum gas (LPG).

Enemalta Corporation imported 19,513 tons of LPG in 2005. Of these, 80% was sold in cylinders for residential use equating to 15610.4 tons of LPG. Using an average calorific value of 12.45 kWh/kg of LPG results in a final energy consumption of 194,349 MWh.

Using the IPCC emission factor for LPG of 0.227 tCO<sub>2</sub>/MWh, results in 43.86 Gg of CO<sub>2</sub> emissions. The National Inventory report 44.44 Gg of CO<sub>2</sub> emissions from fuel combustion in residential buildings for 2005. The difference is attributed to minor use of kerosene in residential buildings, equivalent to 2285.16 MWh and 580 tCO<sub>2</sub>.

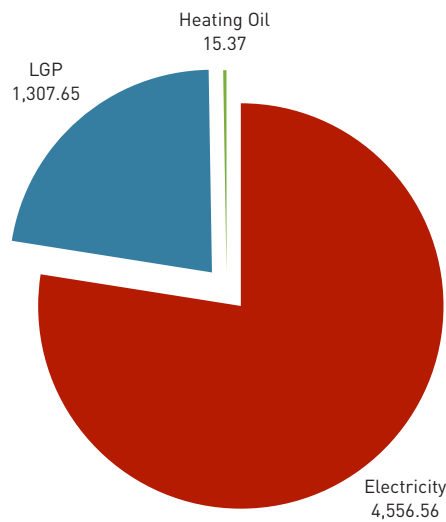
By applying the two dimensional matrix, described above, 1307.65 MWh equivalent of liquid gas can be attributed to the locality. The equivalent quantity of CO<sub>2</sub> emissions is equal to 295.58 tCO<sub>2</sub> for the baseline year.

### 5.2.3 Kerosene

The use of kerosene (reported as "heating oil" in the baseline inventory) is equivalent to 15.37 MWh of energy and 3.91 tCO<sub>2</sub> for the baseline year.

**Table 12.4: Energy Consumption for residential buildings**

Type of Fuel	Energy Consumption (MWh)	CO <sub>2</sub> Emissions (tCO <sub>2</sub> )
Electricity	4,556.56	3,950.53
Liquefied Petroleum Gas (LPG)	1,307.65	295.58
Heating Oil (Kerosene)	15.37	3.91
Total Energy Consumption & Total CO <sub>2</sub> Emissions	5879.58	4250.02

**Figure 12.6: Pie chart for energy consumption for residential buildings**

### 5.3 Tertiary (Non Municipal) Buildings, Equipment and Facilities

As explained above, electricity consumption data for the locality is not split by sector. However, since a reasonable good degree of confidence exists for the estimation of residential electrical energy consumption, and since the locality does not have any particularly sizeable industries, the amount of electrical energy used in tertiary buildings, equipment and facilities is deemed to be equal to the difference between the locality's total electrical energy metered and the sum of the municipal and residential energy consumption. This may prove to be a slight overestimation of the tertiary energy consumption.

#### 5.3.1 Electricity

The locality's total electricity consumption, excluding street lighting, for the baseline year, was 6411.058 MWh. Using the above assumption, the electrical energy consumption in the tertiary (non municipal) buildings, equipment and facilities is equal to 1837.34 MWh.

Using the emission factor for electricity calculated above, the CO<sub>2</sub> contribution of tertiary (non municipal) buildings, equipment and

facilities for the baseline year is equal to 1592.97 tCO<sub>2</sub> for the baseline year.

#### 5.3.2 Liquefied Petroleum Gas (LPG)

Since bulk fuel is distributed by a number of private contractors, consumption of fuels by locality is not available from Enemalta Corporation. On a national level, using the data from the GHG CRF Tables for Malta for the baseline year, the total amount of liquefied petroleum gas (LPG) used in commercial and institutional buildings amounts to 47,059.84 MWh equivalent to 10,600 tCO<sub>2</sub>.

Using data from the National Statistics Office, a total of 360 businesses operate in the locality of Dingli. This is equivalent to 0.653% of the national business community.

Although due to their different nature of operations, different businesses consume different amounts of energy per unit, since data is not available at a locality level, it is considered appropriate to allocate the same percentage for the fuel combustion in tertiary (non municipal) buildings to the locality.

With this rationale, the energy from liquid gas consumed in the locality equates to 307.30 MWh equivalent to 69.22 tCO<sub>2</sub>.

#### 5.3.3 Other Fossil Fuels

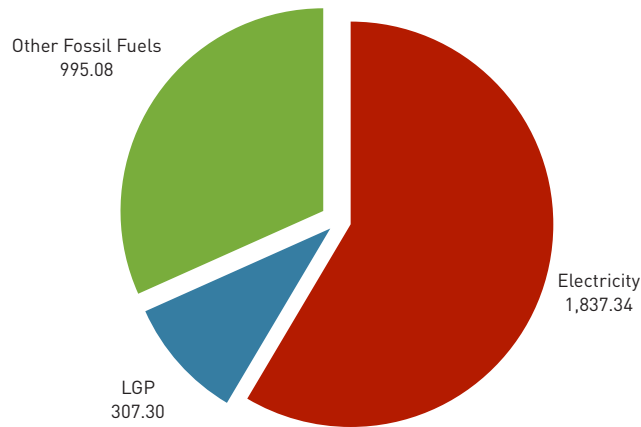
On a national level, the total amount of other liquid fuels used, amounts to 152,385.7 MWh equivalent to 40,400 tCO<sub>2</sub>.

Using the same reasoning as for LPG, an amount of 995.08 MWh of energy from other liquid fuels was consumed in the baseline year in the locality, equivalent to 263.81 tCO<sub>2</sub>. This latter amount includes both heating oil and diesel but the proportions of the two types of fuel are not available. For this reason, it is reported under "Other Fossil Fuels" in the Baseline Emissions Inventory tables.

When one considers the proximity of localities in Malta together with the fact that citizens frequently make use of businesses from localities other than their own, the above reasoning of proportioning fuel consumption in tertiary (non municipal) buildings by the proportion of businesses registered in the locality is the best possible approximation using the data available.

**Table 12.5: Energy Consumption for tertiary buildings, equipment and facilities**

Type of Fuel	Energy Consumption (MWh)	CO <sub>2</sub> Emissions (tCO <sub>2</sub> )
Electricity	1837.34	1592.97
Liquefied Petroleum Gas (LPG)	307.30	69.22
Other Fossil Fuels (includes Heating Oil and Diesel)	995.08	263.81
<b>Total Energy Consumption &amp; Total CO<sub>2</sub> Emissions</b>	<b>3139.72</b>	<b>1926.00</b>

**Figure 12.7: Pie chart for energy consumption for tertiary buildings**

## 5.4 Accuracy of Electrical Energy Allocation by Sector

It is to be pointed out that although there may be some errors in the allocation of electrical energy by sector, since all electrical energy is being provided from one source, namely Enemalta Corporation, the overall total electrical energy consumed in the locality is correct as it is recorded from billing data.

Any over or underestimation in the residential electrical energy consumption is inversely reflected in the tertiary (non municipal) electrical energy consumption and the overall estimation of the CO<sub>2</sub> emissions by the locality is reasonably accurate.

## 5.5 Municipal Public Lighting

Concurrently with the study for this Baseline Emissions Inventory, the Dingli local council has undertaken an energy audit of public areas within the locality with specific attention to municipal public lighting. The findings of this energy audit are being reproduced hereunder for completeness and for straightforward reference.

**Table 12.6: Energy Consumption for street lighting**

Type	Number of Fittings	Nominal Power Consumption (W)	Power Consumption Including Control Gear (W)	Estimated Annual Energy Consumption (kWh)
L	188	70	77	62536
M	12	80	88	4652
W	143	70	77	47568
Z	7	100	100	3024
S	5	70	77	1663
C	4	70	77	1330
Y	24	70	77	7983
R	2	3 x 11	33	285
F	2	400	440	3802
Others	2	4 x 11	44	760
New	28	70	77	9314
<b>TOTAL</b>	<b>417</b>			<b>142,917</b>

An inventory of all installed street lighting luminaires in the locality has been carried out. Together with this, the annual operating time was also estimated in order to achieve a figure for the annual energy consumption for each type of light fitting installed.

For traceability purposes, the nomenclature pertaining to the type of fittings is identical to the nomenclature available on the survey maps provided by the local council.

It is to be noted that, since the fittings marked as "new" have been installed after the baseline year, they shall be excluded from this baseline emissions inventory. Therefore, the subtracted annual

energy consumption for municipal street lighting in the baseline year is equal to 133,603 kWh or 133.603 MWh.

Since the source of energy for municipal public lighting is electricity, originating from the same source, the equivalent emission factor is identical as for residential buildings, specifically 0.867 tCO<sub>2</sub>/MWh. This corresponds to an annual CO<sub>2</sub> emission for municipal public lighting of 115.83 tCO<sub>2</sub>.

## 5.6 Industries

Industries are currently under the responsibility of Malta Enterprise, a central government agency responsible for the promotion of foreign investment and industrial development in Malta. This agency is already advocating energy saving initiatives under the European Regional Development Fund (ERDF) and several grants have been given to aid industries in reducing their energy consumption and carbon footprint.

Since industries are therefore not under the jurisdiction of the local council, and since the authority of local councils over industrial estates is specifically excluded under the Local Councils Act, emissions due to industries have been explicitly excluded from the Baseline Emissions Inventory and the Sustainable Energy Action Plan.

This option is in line with the guidelines for Baseline Emissions Inventories under the Covenant of Mayors.

## 6. Transport

### 6.1 Municipal Fleet

The local council owns and operates one vehicle, namely, a commercial light truck used by the handyman for maintenance purposes. This vehicle is operated by means of a Diesel powered internal combustion engine. The fuel consumption for the baseline year was equal to 460 litres.

A calorific value of 10.0 kWh/l was used for Diesel, as indicated in Part II of the Guidebook on the development of SEAPs. Therefore, the energy consumption for the municipal vehicle in this locality is equal to 4.60 MWh. Applying the IPCC emission factor of 0.267 tCO<sub>2</sub>/MWh for Diesel gives an annual emission of 1.23 tCO<sub>2</sub>.

specific data. Due to the close proximity of localities in Malta, it is very common that vehicles are refuelled in a locality other than the registered locality. For this reason, it has been considered inappropriate to obtain fuel consumption data per locality.

Once again, a level of proportioning of national data has been inevitable.

An analysis of the vehicle stock for the baseline was carried out. It was found out that the locality had 8 agricultural vehicles, 474 commercial vehicles, 9 garage hire vehicles, 3 minibuses, 105 motorcycles, 1532 private vehicles, 2 buses, 5 self drive cars and 1 taxi in the baseline year.

### 6.2 Public Transport

The locality is served by one route on the national public transport schedule. It has been calculated that 25,086 annual trips are undertaken. The route length is equal to 14.5km. This results in an annual travel distance of 363,747 km.

The public transport service is operated by a mixture of new and old vehicles, some of which dating back as far as the 1970's. All vehicles are operated by Diesel powered internal combustion engines. When considering the number of stops, the means speed and the type of buses in operation, a fuel consumption value of 55l/100km has been considered reasonable to estimate the fuel consumption on this route. Therefore, the calculated annual Diesel consumption is that of 200,061 litres.

A fuel consumption weighting factor has been assigned to each type of vehicle based on the engine capacity and estimated activity. From this, the annual energy consumption and CO<sub>2</sub> emissions allocated to the locality have been calculated.

The amount attributable to public transport has been deducted to avoid double accounting. This is accounted for under a separate computation (see above).

The energy consumption for private and commercial transport for the baseline year is equal to 9474.56 MWh divided as 4818.06 MWh from Gasoline (Petrol), 4620.80 MWh from Diesel and 35.70 MWh originating from the use of Bio-Diesel.

Using a calorific value of 10.0 kWh/l of Diesel, then the energy consumption for public transport for the locality is equal to 2000.06 MWh. Applying the IPCC emission factor of 0.267 tCO<sub>2</sub>/MWh for Diesel gives an annual emission of 534.16 tCO<sub>2</sub>.

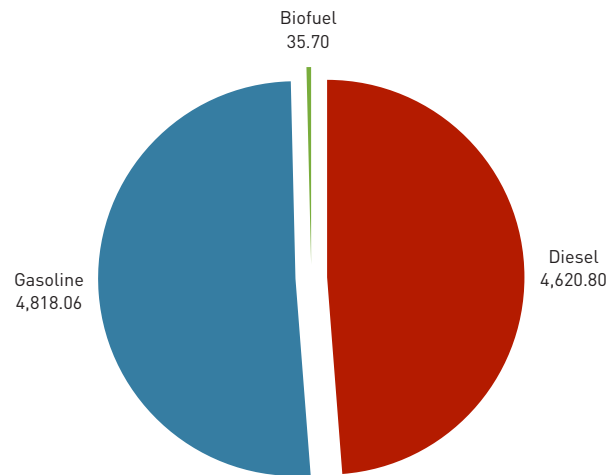
Since proportioning of National data has been carried out in this part of this exercise, the emission conversion factors used in the National Emissions Inventory Report were used for consistency. The equivalent CO<sub>2</sub> emissions add up to 2418.82 tCO<sub>2</sub> in total, divided as 1189.97 tCO<sub>2</sub> due to combustion of Gasoline (Petrol), 1219.74 tCO<sub>2</sub> due to combustion of Diesel and 9.11 tCO<sub>2</sub> due to combustion of Bio-Diesel for private and commercial transport.

### 6.3 Private and Commercial Transport

The case of private and commercial transport is similar to that for residential and commercial buildings, that is, there is no locality

**Table 12.7: Energy Consumption For Private And Commercial Transport**

Type of Fuel	Energy Consumption (MWh)	CO <sub>2</sub> Emissions (tCO <sub>2</sub> )
Diesel	4620.80	1219.74
Gasoline	4818.06	1189.97
Bio fuel	35.70	9.11
Total Energy Consumption & Total CO <sub>2</sub> Emissions	9474.56	2418.82

**Figure 12.8: Pie chart for energy consumption for private and commercial transport**

## 7. Others

### 7.1 Water Consumption

Since in Malta, production of potable water is mainly from desalination of sea water, the provision of water is an energy intensive process. For this reason, it has been deemed sensible to include the CO<sub>2</sub> related to the production and distribution of water in the baseline emissions inventory.

From utility billing data, the water consumption for the locality, in the baseline year, was equal to 116,292 m<sup>3</sup>. According to the Water

Services Corporation, the specific energy for the production and distribution of water for 2005 was 5.89 kWh/m<sup>3</sup>. This means that the energy consumption relating to the production and distribution of water in the locality for the baseline year was equal to 684.96 MWh.

Since the source of this energy is electricity, using the emission factor of 0.867 tCO<sub>2</sub>/MWh results in a CO<sub>2</sub> emission for water production and distribution of 593.86 tCO<sub>2</sub>.

## 8. Baseline Emissions Inventory (BEI) Summary

### 8.1 Overview

In the baseline year, 2005, the total energy consumption for the locality was equal to 21,334.24 MWh. The total CO<sub>2</sub> emissions associated with this was that of 9,854.80 tCO<sub>2</sub>.

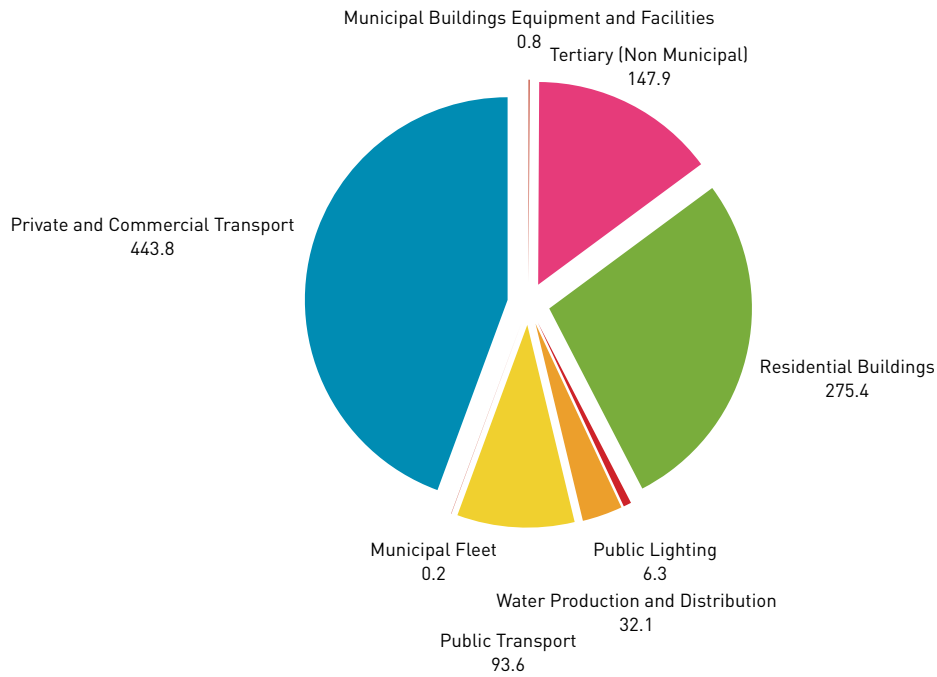
This gives per capita annual values of 6.414 MWh/capita and 2.963 tCO<sub>2</sub>/capita.

**Table 12.8: Overview of annual energy consumption**

	Annual Energy Consumption (MWh)	Annual CO <sub>2</sub> Emissions (t CO <sub>2</sub> )
Locality Total	21,334.24	9,854.80
Per Capita	6.414	2.963

## 8.2 Energy Consumption by Sector

**Figure 12.9: Pie chart for energy consumption by sector**



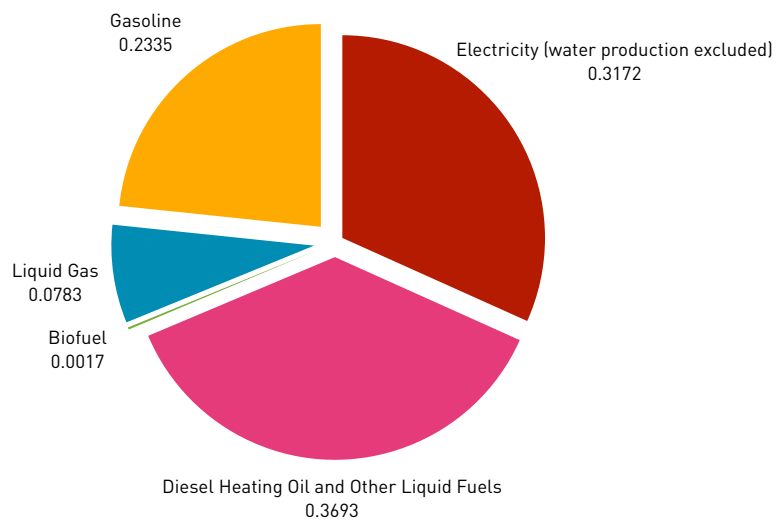
The above pie chart shows the distribution of energy consumption by sector, in the locality. The largest consumer of energy is the sector of Private and Commercial Transport (44.38%) followed by Residential Buildings (27.54%). This is followed by Tertiary (Non Municipal) Buildings, Equipment and Facilities (14.79%) and Public Transport (9.36%).

Municipal Buildings, Equipment and Facilities, as expected, contribute to a very small fraction of the locality's energy consumption. The same situation occurs for the single vehicle municipal fleet.

## 8.3 Energy Consumption by Source

The sources of energy in the locality are Electricity, Liquid Gas, Diesel and Heating Oil (combined as indicated in Tertiary buildings estimates), Gasoline and Bio fuels.

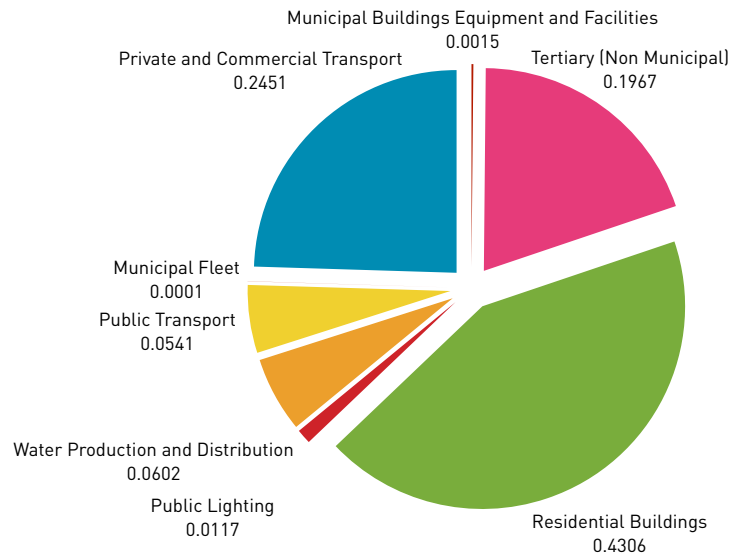
**Figure 12.10: Pie chart for energy consumption by source**



Diesel and heating oil (including other liquid fuels) are the major contributors of energy supplying the Transport sector and to a lesser extent as a source of heat in Tertiary (Non Municipal) Buildings. Electricity is the next largest source of energy and it is mainly consumed in Residential Buildings and Tertiary (Non Municipal) Buildings, Equipment and Facilities.

### 8.4 Carbon Dioxide (CO<sub>2</sub>) Emissions by Sector

Figure 12.11: Pie chart for Carbon Dioxide (CO<sub>2</sub>) Emissions by Sector



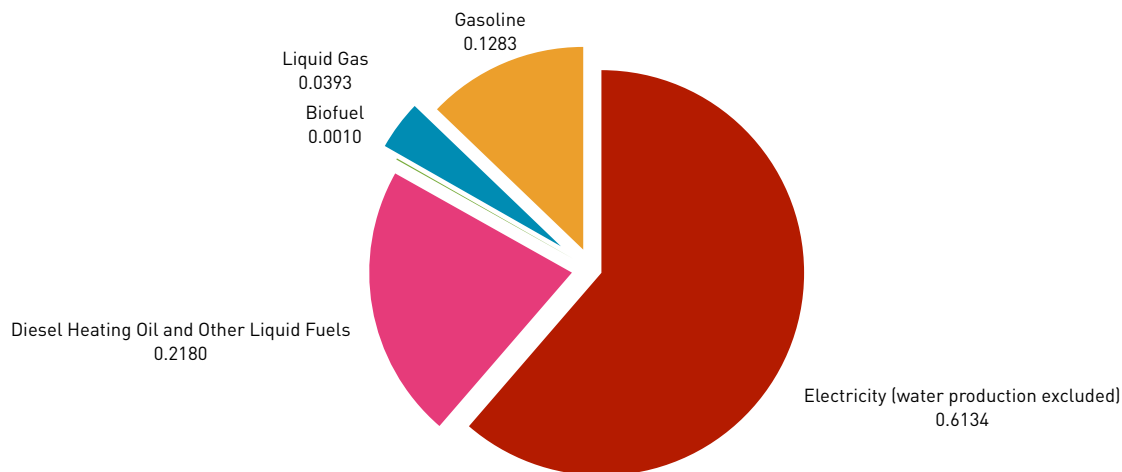
In comparison, the above chart shows the distribution of CO<sub>2</sub> emissions by sector. Evidently, the share of CO<sub>2</sub> emissions due to residential buildings (43.06%) is significantly larger than the share of energy consumption for the same sector. This is mainly due to the fact that the source of energy for a large proportion of energy used in residential buildings is electricity. In fact, this percentage, compares very well to the benchmark European average contribution from residential buildings of 40%. This means that there is a huge potential for reduction in this sector.

The next largest sector remains that of Private and Commercial Transport, to be followed by Tertiary (Non Municipal) Buildings.

### 8.5 Carbon Dioxide (CO<sub>2</sub>) Emissions by Source of Energy

The graph below shows the sources of CO<sub>2</sub> emissions by source of energy. Due to the relatively high emission factor for electricity, the CO<sub>2</sub> emissions due to this source of energy are significantly highest even though it is not the largest energy provider for the locality. This means that any initiative to reduce the consumption of electricity has the highest effect in reducing the CO<sub>2</sub> emissions.

Figure 12.12: Pie chart for Carbon Dioxide (CO<sub>2</sub>) Emissions by Source of Energy



## Baseline Emissions Inventory (BEI) Tables

### General Data

**Table 12.9: General data from Baseline Emissions Inventory**

<b>Baseline Year</b>	2005
<b>Number of Inhabitants in Baseline Year</b>	3326
<b>Emission Factors</b>	Standard Emission Factors in line with IPCC Principles
<b>Emission Reporting Unit</b>	CO <sub>2</sub> Emissions
<b>Total Annual Energy Consumption per Capita</b>	6.414 MWh
<b>Total Annual CO<sub>2</sub> Emissions per Capita</b>	2.963 tCO <sub>2</sub>

Key Results of the Baseline Emissions Inventory

**Table 12.10: Final Energy Consumption (MWh)**

Category	Electricity	Fossil Fuels					Bio fuel	TOTAL
		Liquid Gas	Heating Oil	Diesel	Gasoline	Other Fossil Fuels*		
<b>BUILDINGS, EQUIPMENT AND FACILITIES</b>								
Municipal Buildings, Equipment and Facilities	17.16	0	0	0	0	0	0	17.16
Tertiary (Non Municipal) Buildings, Equipment and Facilities	1837.34	307.30	0	0	0	995.08	0	3139.72
Residential Buildings	4556.56	1307.65	15.37	0	0	0	0	5879.58
Municipal Public Lighting	133.60	0	0	0	0	0	0	133.60
Subtotal Buildings, Equipment, Facilities	6544.66	1614.95	15.37	0	0	995.08	0	9170.06
<b>TRANSPORT</b>								
Municipal Fleet	0	0	0	4.6	0	0	0	4.6
Public Transport	0	0	0	2000.06	0	0	0	2000.06
Private and Commercial Transport	0	0	0	4620.80	4818.06	0	35.70	9474.56
Subtotal Transport	0	0	0	6625.46	4818.06	0	35.70	11479.22
<b>OTHERS</b>								
Water Production and Distribution	684.96	0	0	0	0	0	0	684.96
<b>TOTAL (MWh)</b>	<b>7229.62</b>	<b>1614.95</b>	<b>15.37</b>	<b>6625.46</b>	<b>4818.06</b>	<b>995.08</b>	<b>35.70</b>	<b>21334.24</b>



\*Includes and Combination of Heating Oil and Diesel used in Tertiary (Non Municipal) Buildings

**Table 12.11: CO<sub>2</sub> emissions (t)**

Category	Electricity	Fossil Fuels					Bio fuel	TOTAL
		Liquid Gas	Heating Oil	Diesel	Gasoline	Other Fossil Fuels*		
<b>BUILDINGS, EQUIPMENT AND FACILITIES</b>								
Municipal Buildings, Equipment and Facilities	14.88	0	0	0	0	0	0	14.88
Tertiary (Non Municipal) Buildings, Equipment and Facilities	1592.97	69.22	0	0	0	263.81	0	1926.00
Residential Buildings	3950.53	295.58	3.91	0	0	0	0	4250.02
Municipal Public Lighting	115.83	0	0	0	0	0	0	115.83
Subtotal Buildings, Equipment, Facilities	5674.21	364.80	3.91	0	0	263.81	0	6306.73
<b>TRANSPORT</b>								
Municipal Fleet	0	0	0	1.23	0	0	0	1.23
Public Transport	0	0	0	534.16	0	0	0	534.16
Private and Commercial Transport	0	0	0	1219.74	1189.97	0	9.11	2418.82
Subtotal Transport	0	0	0	1755.13	1189.97	0	9.11	2954.21
<b>OTHERS</b>								
Water Production and Distribution	593.86	0	0	0	0	0	0	593.86
<b>TOTAL (tCO<sub>2</sub>)</b>	<b>6268.07</b>	<b>364.80</b>	<b>3.91</b>	<b>1755.13</b>	<b>1189.97</b>	<b>263.81</b>	<b>9.11</b>	<b>9854.8</b>
Corresponding CO <sub>2</sub> Emission Factors (tCO <sub>2</sub> /MWh)	0.867	0.226	0.254	0.265	0.247	0.265	0.255	0.462

\*Includes and Combination of Heating Oil and Diesel used in Tertiary (Non Municipal) Buildings

## 9. Sustainable Energy Action Plan (SEAP)

### 9.1 Dingli's Vision towards a Sustainable Energy Future

In line with the objectives of the Covenant of Mayors, the locality of Dingli is setting the following vision statement as its guiding principle in its effort in favour of a Sustainable Energy Future for the locality.

*"The locality of Dingli shall be a fore-runner in its actions towards sustainable development where its energy consumption shall be reduced to minimize CO<sub>2</sub> emissions.*

*It shall be a net contributor to the reduction of CO<sub>2</sub> emissions at a National and European level, in proportion to its population and resources.*

*Dingli aims to become a village in which its residents can identify themselves with the locality's goal to sustainable living with minimal environmental impact."*

## 9.2 Actions to Implement the Locality's Vision towards Energy Sustainability

As mentioned previously in this document, the local council is committing itself to reduce CO<sub>2</sub> emissions in the areas under its direct jurisdiction. These include emissions due to energy consumption in municipal buildings, municipal public lighting and the municipal fleet. It is to be noted that municipal public lighting is not presently under

the jurisdiction of the local council but it is expected that in the term of the Covenant of Mayors, that is, by the year 2020, the responsibility of municipal public lighting excluding arterial roads would be handed over to the local authorities.

The following table lists the annual energy consumption and CO<sub>2</sub> emissions that the local council is committing itself to reduce.

**Table 12.12: Annual Energy Consumption Under Local Council's Jurisdiction**

Field of Action	Energy Consumption (MWh)	CO <sub>2</sub> Emissions (tCO <sub>2</sub> )
Municipal Buildings, Facilities and Equipment	17.16	14.88
Municipal Public Lighting	133.60	115.83
Municipal Fleet	4.6	1.23
Total Energy Consumption & Total CO <sub>2</sub> Emissions	155.36	131.94

The quantifiable actions of this sustainable energy action plan listed below shall reduce the above CO<sub>2</sub> emissions by 24%.

The local council is, however, aware that this is a small fraction of the locality's total emissions. For this reason, it shall include also in this action plan, those actions that it can possibly take to enable the reduction of CO<sub>2</sub> emissions in the locality either by providing education and general information to the citizens in its locality. Though, since it has no authority on the remaining fields of action, it cannot be committed with a finite quantified emission reduction.

The major and most significant reduction in CO<sub>2</sub> emissions shall result from an improvement in electricity generation in Malta. This shall reduce the emission factor for electricity and hence the overall emissions. Malta is also committed to ensure that 10% of its energy needs shall be provided by renewable sources by the year 2020. This shall also have an effect on the reduction of the locality's emissions. Such measures are nevertheless under the control of central government.

### i. Buildings, Equipment and Facilities

#### 1. Municipal Buildings, Equipment and Facilities

Action 1.1: Conduct an energy audit for local council buildings.

The local council shall conduct an energy audit of its office buildings in order to identify possibilities of reducing energy consumption. This in itself does not reduce emissions but will serve as a basis for the identification of tangible actions which will reduce the annual consumption.

**Action 1.2: Conduct an energy audit for public gardens and recreational areas in the locality.**

Similar to Action 1.1, this energy audit shall identify means of reducing energy consumption in public areas in the locality. Such actions will also not reduce energy consumption directly. However, if the work is publicised well, it may also have an effect of increasing the awareness

of the citizens of the locality and involve them in the process of decreasing energy consumption in the locality, possibly encouraging them to take other actions under their direct control.

**Action 1.3: Perform actions identified in energy audit for local council buildings, municipal lighting facilities and public gardens and recreational areas.**

Following actions 1.1 and 1.2, any actions identified shall be implemented over the course of the Covenant of Mayors. Neither the cost, nor the expected emission reduction can be quantified at this stage.

**Action 1.4: Install a 2kWp (minimum) photovoltaic system to serve the Local Council building.**

The local council shall commission the installation of a photovoltaic system of minimum rating of 2kWp to provide part of the electrical energy used in the Local Council office building. It is expected that such a system shall cost in the order of € 9,000 and shall reduce annual energy consumption and CO<sub>2</sub> emissions by 3.30 MWh equivalent to 2.86 tCO<sub>2</sub>.

**Action 1.5: Identify possibilities and proceed with installation of further renewable energy systems on other public buildings to be managed by the local council.**

The Local Council shall embark on a project to identify a number of sites that are potentially suitable for installation of further renewable energy systems, possibly employing different technologies. Such buildings may include buildings owned by the central government. The Local Council shall enter in an agreement with the owner of the proposed sites to install the renewable energy systems and eventually take over the installation, maintenance and management of such systems.

Since the possibilities are not identified at this stage, the expected cost and energy savings cannot be quantified at this stage. It is however expected that carefully chosen sites, systems and technologies shall

make such initiative revenue neutral in the payback period of the system.

Such an action shall have the added advantage of promoting renewable energy systems in the locality and enable the citizens to have firsthand experience with such systems in order to encourage them to invest in their own renewable energy technology.

## 2. Tertiary, Non-Municipal Buildings

Action 1.6: Promote energy audits for non-municipal public buildings in the locality such as political clubs, band clubs and sports clubs.

Promotional material shall be provided to promote the implementation of energy audits for non municipal public buildings. The aim is that buildings where citizens gather for social and other activities get on board with the locality on its commitment to reduce emissions. Such clubs and social groups are very likely to have an influential effect on their members and hence a large portion of the civil society can be made aware of the locality's initiatives regarding emission reduction measures.

## 3. Residential Buildings

Action 1.7: Perform energy audits in a limited number of dwellings (tentatively 5 residences) to serve as a pilot study.

The local council shall embark on a pilot study on a limited number of residences in order to identify the potential to reduce energy consumption and emissions. Such residences are to be selected on the criteria that their tenants are willing to invest in energy reduction measures. The findings of this study shall be used in Action 1.8.

**Action 1.8: Analyze Data from Pilot Study and present it to the public for information.**

The information gathered from this pilot study shall be analysed and used in a public awareness campaign on the possibilities that do in fact exist for reducing energy consumption in residential buildings.

**Action 1.9: Conduct a public awareness campaign and organise Energy Days to involve the wider public in the use of renewable energy sources and energy efficiency.**

As committed in the Covenant of Mayors, the local council shall periodically organise Energy Days to involve the general public in activities related to the production or use of renewable energy sources and energy efficiency. These can take the form of guided visits and tours, education activities, open door days and exhibitions.

**Action 1.10: Conclude agreement(s) with a number of suppliers of renewable energy systems to obtain preferential prices for use in buildings in the locality.**

By entering into an agreement with a number of suppliers of renewable energy systems, the local council shall be in a position to offer residences in its locality the possibility to purchase renewable energy technology at reduced prices. This model has already been employed in Malta and has been very successful at a local level. It should be aimed to introduce a renewable energy system on at least 50% of rooftops in the locality.

Typical renewable energy systems may include but are not limited to solar (water and space) heating systems, photovoltaic systems and vertical axis (low noise) helical wind turbines which tend to be more aesthetic due to its design and quieter because of the lower blade tip speed. Obviously this is subject to the approval of the Malta Environment and Planning Authority and/or other authorities as applicable.

## 4. Municipal Public Lighting

**Action 1.11: Conduct an energy audit for municipal lighting facilities in the locality to assess the adequacy of public lighting and identify methods to improve energy efficiency.**

A detailed energy audit of municipal public lighting shall be undertaken to assess the adequacy of public lighting and identify methods to improve energy efficiency.

**Action 1.12: Install intelligent street lighting control systems in all substations.**

By installing intelligent (such as adaptive) street lighting control systems in the locality, it is predicted that around 25% of energy used for street lighting can be reduced. This would equate to a reduction of 28.96 tCO<sub>2</sub> emissions annually.

It is expected that such a system would cost around € 100,000 for the whole locality with a payback period in the order of 3 years. Funding from central government may be required for this action.

## ii. Transport

### 1. Municipal Fleet

**Action 2.1 Replace the existing vehicle with a more efficient model when due for replacement.**

When the existing vehicle is due for replacement, the selection of the new vehicle shall be such that it has a higher energy performance than the existing.

### 2. Private and Commercial Transport

**Action 2.2: Provide preferential reserved parking spaces for electric, hybrid or low emission vehicles.**

In order to promote the introduction of electric or hybrid vehicles, the local council is to provide a number of preferential parking spaces in the centre of the locality such that these spaces are reserved for these types of vehicles only.

In addition, the local council shall provide a number of small parking spaces specifically for small vehicles that are likely to produce lower emissions. This approach is already being applied in other countries.

## iii. Local Electricity Production

### 1. Combined Heat and Power

**Action 3.1: Conduct a feasibility study for installation of a Combined Heat and Power with Absorption Cooling in Public Building (if deemed feasible)**

The local council shall conduct a feasibility study for the installation of a combined heat and power unit with absorption cooling for use in a prominent public building. If the project is deemed feasible, the local council shall attempt to proceed with funding and installation.

#### iv. Land Use Planning

##### 1. Carbon Sequestration Measures

**Action 4.1:** Conduct a locality survey to identify locations where new trees can be planted. Survey is to identify possible locations by available areas or number of tree spaces.

Although not strictly an energy initiative, this action is intended to make maximum use of spaces available for the planting of new vegetation, especially trees that have the function to capture atmospheric CO<sub>2</sub> and offset part of the locality's emissions.

**Action 4.2: Undertake a tree planting exercise as identified in the locality survey (Action 4.1) to counteract emissions produced in the locality.**

Conduct a tree planting exercise in the locality involving as much as possible the general public in participating in such exercise. This can be combined with the Energy Days activities.

#### v. Local District Heating / Cooling, CHPs

Not applicable for the locality.

#### vi. Public Procurement of Products and Services

##### 1. Energy Efficiency Requirements / Standards

**Action 6.1: Establish a policy such that all equipment purchased by Local Council is rated as the least energy consuming.**

All tenders for the purchase of equipment issued by the local council shall include a clause to give preference to the equipment which consumes least energy for the same functions.

**Action 6.2: Establish a policy such that service providers that have recognised environmental policies and independent accreditation will be given preference in the selection process.**

It shall be the council policy that in the selection process, preference is given to service providers with recognised environmental policies and independent accreditation. Such a policy shall be communicated in all tender documents.

#### vii. Working with the Citizens and Stakeholders

##### 1. Awareness raising and local networking

**Action 7.1: Consult with Malta Resources Authority about the possibility of offering energy saving incentives applications from the Local Council Office.**

The local council shall investigate the possibility of processing applications for renewable energy incentives by the Malta Resources Authority from its offices within the locality, thereby making it easier for residents to participate and benefit from such incentives.

Table 12.13: List of Actions of the SEAP

Sectors and Fields of Action	Key Actions and Measures	Implementation (Start and End Time)	Expected Costs per Action or Measure	Expected CO <sub>2</sub> Reduction per Measure [Tonnes CO <sub>2</sub> pa]
<b>1. Buildings, Equipment and Facilities</b>				
Municipal Buildings, Equipment and Facilities	1.1 Conduct an energy audit for local council buildings.	Start: January 2010 End: June 2010	€ 1000	Nil
	1.2 Conduct an energy audit for public gardens and recreational areas in the locality.	Start: January 2010 End: June 2010	€ 1000	Nil
	1.3 Perform actions identified in energy audit for local council buildings, municipal lighting facilities and public gardens and recreational areas.	Start: July 2010 End: As indicated in respective Energy Audit recommendations.	Depending on Actions Identified in Actions 1.1 and 1.2 above.	Not Quantifiable at this stage.
	1.4 Install a 2kWp (minimum) PV system to serve the local council building.	Start: January 2011 End: June 2011	€ 9000	2.86 tCO <sub>2</sub>
	1.5 Identify possibilities and proceed with installation of further renewable energy systems on other public buildings to be managed by the local council.	Start: 2013 End: 2017	Depending on technologies employed and capacity installed.	Not Quantifiable at this stage.
Tertiary, Non-Municipal Buildings	1.6 Promote energy audits for non-municipal public buildings in the locality such as political clubs, band clubs and sports clubs.	Start: January 2011 End: June 2011	€ 500 for promotional material	Nil
Residential Buildings	1.7 Perform energy audits in a limited number of dwellings (tentatively 5 residences) to serve as a pilot study.	Start: July 2011 End: June 2012	€ 750 for performance of energy audits in 5 dwellings	Nil
	1.8 Analyze Data from Pilot Study and present it to the public for information.	Start: July 2012 End: September 2012	€ 500 for an analysis report of pilot study	Nil
	1.9 Conduct a public awareness campaign and organise Energy Days to involve the wider public in the use of renewable energy sources and energy efficiency	Start: October 2012 End: Ongoing till 2020	€ 2,000 for promotional material and organisation of events.	Not Quantifiable.
	1.10 Conclude agreement(s) with a number of suppliers of RE systems to obtain preferential prices for use in buildings in the locality.	Start: January 2013 End: December 2013	Nil	Not Quantifiable at this stage.
Municipal Public Lighting	1.11 Conduct an energy audit for municipal lighting facilities in the locality to assess the adequacy of public lighting and identify methods to improve energy efficiency.	Start: January 2010 End: June 2010	€ 1,000	Nil
	1.12 Install intelligent street lighting control system in all substations.	Start: January 2017 End: December 2019	€ 100,000	28.96 tCO <sub>2</sub>

Sectors and Fields of Action	Key Actions and Measures	Implementation (Start and End Time)	Expected Costs per Action or Measure	Expected CO <sub>2</sub> Reduction per Measure [Tonnes CO <sub>2</sub> pa]
<b>2. Transport</b>				
Municipal Fleet	2.1 Replace the existing vehicle with a more efficient model when due for replacement.	Start: 2018 End: 2018	Depending on model chosen, there may be an additional cost for an energy efficient version.	Not Quantifiable.
Private and Commercial Transport	2.2 Provide preferential reserved parking spaces for electric, hybrid or low emission vehicles.	Start: January 2012 End: December 2012	€ 250 for additional signage and road marking.	Not Quantifiable.
<b>3. Local Electricity Production</b>				
Combined Heat and Power	3.1 Conduct a feasibility study for the installation of a Combined Heat and Power with Absorption Cooling in Public Building. Install unit if deemed feasible	Start: January 2018 End: December 2020	Prices are not yet known as the technology is still developing. It is envisaged that feasible commercial units will be available by 2018.	Not Quantifiable.
<b>4. Land Use Planning</b>				
Carbon Sequestration Measures	4.1 Conduct a locality survey to identify locations where new trees can be planted. Survey is to identify possible locations by available areas or number of tree spaces.	Start: January 2011 End: March 2011	€ 100 for administrative costs	Nil
	4.2 Undertake a tree planting exercise as identified in the locality survey (see Action 4.1) to counteract emissions produced in the locality.	Start: October 2011 End: As indicated in survey recommendations.	Depending on the number of trees to be planted.	Not Quantifiable
<b>5. Local District Heating and Cooling</b>				
Local District Heating and Cooling	Not Applicable			Nil
<b>6. Public Procurements of Products and Services</b>				
Energy Efficiency Requirements and Standards	6.1 Establish a policy such that all equipment purchased by Local Council is rated as the least energy consuming.	Start: September 2010 End: Ongoing	Nil	Not Quantifiable.
	6.2 Establish a policy such that service providers that have recognized environmental policies and independent accreditation are preferred in the selection process.	Start: March 2011 End: Ongoing	Nil	Not Quantifiable
<b>7. Working With The Citizens And Stakeholders</b>				
Awareness raising and local networking	7.1 Consult with the Malta Resources Authority about the possibility of offering energy saving incentives applications from the Local Council office.	Start: September 2010 End: September 2010	Nil	Nil
<b>TOTAL</b>				<b>31.82 tCO<sub>2</sub></b>



## Conclusions

Although the jurisdiction and power of local councils in Malta is rather limited, this shall not be a restrictive factor in preventing the locality of Dingli from being an active participant in the Covenant of Mayors.

It is remarkable, that besides those fields of action on which the Local Council has direct control, it has committed itself on a number of actions, included in this plan, covering fields outside its direct authority.

In this way, its contribution to the reduction of CO2 emissions by 2020, together with the initiatives taken at a National level, shall be a significant factor in the abatement of global climate change in proportion to the population and resources of the locality.

The locality of Dingli, by its participation and adherence to the Covenant of Mayors, aims to demonstrate that small and seemingly minor actions, can have significant measurable effects in the fight against climate change.

## Acknowledgements

This Sustainable Energy Action Plan has been completed with the support of a number of entities, from the Covenant of Mayors Supporting Structure in Malta, namely the Local Councils Association, utility providers and the Joint Research Centre of the European Commission.

We would like to acknowledge the supportive role of the following persons whose help has been found to be invaluable in the compilation of this document.

Mr. Damian Bornas Cayuela, Joint Research Centre, European Commission

Mr. Ronald Piers, Joint Research Centre, European Commission

Mr. Jimmy Magro, Executive Secretary, Local Councils Association



## Appendix 1: Dwelling Stock Breakdown

**Table 12.14: National Dwelling Stock Breakdown**

Number of Persons	Total	Number of Rooms										
	139178	1	2	3	4	5	6	7	8	9	10	10+
1	26259	342	1717	3715	5600	6872	4582	1719	887	337	261	227
2	35643	67	762	2516	6547	10099	7919	3811	2120	855	503	444
3	30581	30	303	1153	4173	8749	7655	4063	2370	940	644	501
4	30729	10	174	607	2807	7737	8344	5154	2967	1306	832	791
5	11331	8	58	224	918	2521	2887	2066	1262	608	430	349
6	3351	3	14	90	291	796	833	525	332	200	121	146
7	874		5	21	67	223	209	133	103	38	46	29
8	266	1	3	12	25	60	50	45	28	13	10	19
9	84		3	5	10	27	16	7	5	4	4	3
10+	60		2	5	9	12	14	7	4	2	3	2
<b>Total</b>	<b>139178</b>	<b>461</b>	<b>3041</b>	<b>8348</b>	<b>20447</b>	<b>37096</b>	<b>32509</b>	<b>17530</b>	<b>10078</b>	<b>4303</b>	<b>2854</b>	<b>2511</b>

Source: Census of Population and Housing 2005, Volume 2, Dwellings, NSO, Malta 2007

**Locality (Dingli) Dwelling Stock Breakdown**

Number of Persons	Total	Number of Rooms										
	1033	1	2	3	4	5	6	7	8	9	10	10+
1	101	1	7	17	26	18	21	7			1	3
2	202		1	11	32	73	58	17	5	2	1	2
3	266			3	30	78	63	44	30	8	7	3
4	326			2	6	22	28	70	23	14	7	154
5	106			2	6	22	28	24	16	5	2	1
6	24			1	1	3	9	4	4		1	1
7	6					2		2	1	1		
8	2				1				1			
9	0											
10+	0											
<b>Total</b>	<b>1033</b>	<b>1</b>	<b>8</b>	<b>36</b>	<b>102</b>	<b>218</b>	<b>207</b>	<b>168</b>	<b>80</b>	<b>30</b>	<b>19</b>	<b>164</b>

Source: Census of Population and Housing 2005, Volume 2, Dwellings, NSO, Malta 2007









## Chapter 13

# Infrastructural Projects for Sustainable Development

Michael J. Camilleri, mc<sup>2</sup> architects







## PROJECT 1: Upgrading of 'Misrah il-Mafkar'

'Misrah il-Mafkar' is an existing garden in the midst of the main residential area of Dingli. It serves as an open space within the urban fabric of the village but more importantly it is a recreational spot for the inhabitants. The existing landscaping is outdated and a proper revamp of the whole area will definitely give a new lease of life to the existing dilapidating infrastructure.

Figure 13.1: The Central Monument



The main idea behind the project is to upgrade what exists in order to respect the original designs and to reduce the capital expenditure on the project. This will help in making the project more feasible and therefore more attainable.

Furthermore the introduction of newly constructed reservoirs and solar panels on the existing structures will increase the sustainability of the project. The new lighting designs will be powered using the energy generated and put on the main grid while the reservoirs will ensure a proper drip irrigation system for the landscaped areas.

Currently the garden is dominated with the central monument for Ġuże Ellul Mercer with two small low-lying structures on either side. One is used as a Pizzeria and will be retained and the other is used as a small Health Centre. The latter will be relocated to the new Civic Centre once this is fully operational and a new use will have to be allocated for the building. The main monument and the buildings will be retained.

The existing low lying planter walls will be conserved and reconstructed where damaged. The tarmac central passageway will be paved and new resting zones will be formed along its perimeter. The steep changes in level will be remediated using proper slopes that will be safe for all the people.

All the unsightly service zones will be covered with a wooden trellis that complements the new street furniture and lighting layout.

## PROJECT 2: Civic Centre for the Dingli Local Council

### Preamble

The Dingli Local Council acknowledges that although the buildings discussed in this section fall under the jurisdiction of and are owned by the Government of Malta, they are not vacant as they are presently lease to third-party tenants. In this light, the Local Council has decided not to prejudice any of the rights tenants enjoy today. This project will only be carried out when, and if, tenements become vacant and eventually devolved the Local Council.

The new proposed Civic Centre for the Dingli Local Council will be housed within an existing old building overlooking three different streets; namely Triq il-Kbira, Dahlet is-Sienja and Sqaq il-MUSEUM. The location of the premises is very central and the proposed centre will act as a living hub for the Dingli Community.

The main idea behind the proposed plans is to conserve the old structure in its entirety, thus respecting the building fabric of our forefathers, and propose a modern extension above the existing roof area, symbolising the dynamism of the new community always progressing and looking forward.

Figure 13.2: Triq il-Kbira c/w Dahlet is-Sienja



Currently the whole building is divided into three separate tenements. The eventual amalgamation of the separate tenements is the first step towards achieving the goal of providing a proper Civic Centre for the community.

The main uses that will be housed within the new development include the following:



1. The main offices for the administrative body of the Dingli Local Council
2. The Police Station
3. A Health Centre
4. A permanent exhibition space
5. The Public Library

The new project means that the main three uses that are currently scattered throughout the village will be centralised in one organized building. This is in line with the 'one-stop shop' concept, currently highly promoted by the Central Government.

The **Dingli Local Council Offices** will be directly accessed from the main facade overlooking the open space adjacent to Triq il-Kbira. This open space will be properly landscaped and paved. The new landscaped piazza will open up and expose the beauty of the conserved facade. The main entrance into the offices will be situated in the central area. The main entrance will include a reception area together with a lounge area.

**Figure 13.3: The main facade overlooking the open space**



The main offices and board rooms will be located at the upper floors and accessed through a modern steel staircase that will contrast with the old characteristics of the structure. A lift will also be provided in order to cater for access for all. The main offices at first floor will be linked to a central hall and reception area. A public library and free internet service will be provided in one of the new halls overlooking Sqaq il-MUSEUM. Ample space for sanitary facilities, a kitchenette and archiving will be provided.

At second floor one finds a large space receded from all facades and thus with a surrounding terrace with beautiful views of the village and the countryside beyond. The idea behind this space is to have an ultra modern space with open glass around the periphery increasing the element of natural lighting and ventilation. The second floor will be used for the mayor's office, a large boardroom and an adjoining stranger's gallery in view of the idea of public participation in the administrative works of the Council.

The **Police Station** will be housed in the existing conserved structure at street level accessed through Dahlet is-Sienja. The station will have to separate entrances, one for the general public and one reserved for staff and in cases of emergency. The layout of the premises allows for a small reception and a waiting area, offices for general use, sanitary facilities and a small prison cell for retaining detainees.

The **Health Centre** will have a single entrance in Sqaq il-MUSEUM and will be housed within the existing structure at groundfloor level. The main spaces include a reception area with a waiting hall, sanitary facilities, archives and two separate treatment rooms.

The **Permanent Exhibition Space** will be situated in the existing disused bakery accessed through Dahlet is-Sienja and will feature an exhibition on the traditional making of the Maltese loaf. The purpose of the exhibition is to make the people aware of the importance of conservation – not only the built fabric but also the traditions associated with them. The old existing chimney will be conserved and maintained in a working condition. Other artistic exhibitions may be set up from time to time in this space. Informative material in regards the urbanised part of the locality can be distributed from here to all its visitors.

## PROJECT 3: Centre for Culture and Arts in Triq Ghar Bittija

The proposed development in the open landscaped space in Triq Ghar Bittija involves the conservation of the old British Barracks and the creation of a new Culture and Arts Centre that will be housed in the conserved structure and linked to an open theatre in the form of an outdoor amphitheatre for performing arts.

Currently the old barracks are used as a storage space for the main village feast. Unfortunately throughout the years the existing structure was abused without any concerns in the form of blocking existing openings, creating new access doors and building unreasonable internal walls. The main idea behind the conservation of the structure is to strip off all the added accretions and restore the building to its former glory.

**Figure 13.4: Existing British Structures**





The internal space of the building will include large open spaces with the option of dividing partitions and sanitary facilities.

The landscaping project is more challenging with the creation of underground reservoirs for sustainable irrigation and the creation of a natural earth mound that will house the new proposed amphitheatre stepped into the ground. The landscaping of the area will be upgraded using proper plants and vegetation, street furniture and modern lighting.

The waste separation facilities will be retained and improved.

The existing number of parking spaces will be retained but the road alignment in Triq Ġuże' Ebejer will be realigned according to the

specifications in the approved local plans of the Malta Environment and Planning Authority (MEPA).

The Local Council already asked the devolution of this building from the Lands Department, and is in discussions with non-governmental organisations to run this centre.

**Preamble**

*The Dingli Local Council acknowledges that although the buildings discussed in this section do not fall under its jurisdiction, it has applied to the Lands Department (Government of Malta) for their devolution. In this light the local council has decided not to prejudice any of the rights tenants enjoy today. This project will only be carried out when, and if, the building are devolved to the Local Council.*

## PROJECT 4: Landscaping Project in Triq Ġuże' Ellul Mercer

The proposed landscaping project in Triq Ġuże' Ellul Mercer involves the construction of new landscaped areas with an open green gym area and provision for newly organised parking spaces. The project will also act as an extension to the sports facilities associated with the main village football pitch.

**Figure 13.5: Open wasteland**



Currently the area for the proposed development is an open wasteland with no proper alignment or planning. The initial challenge is to form the proper alignment specified by MEPA in the local plan for the area.

The mobilisation and preparatory works will include the excavation of large spaces for planters and reservoirs that will sustain the landscaped areas through a drip irrigation system.

The project will cater for an organised car parking area, waste separation zone, resting zones and a green outdoor gym. All the areas will be 'protected' by heavily landscaped buffer zones with proper plants and vegetation.

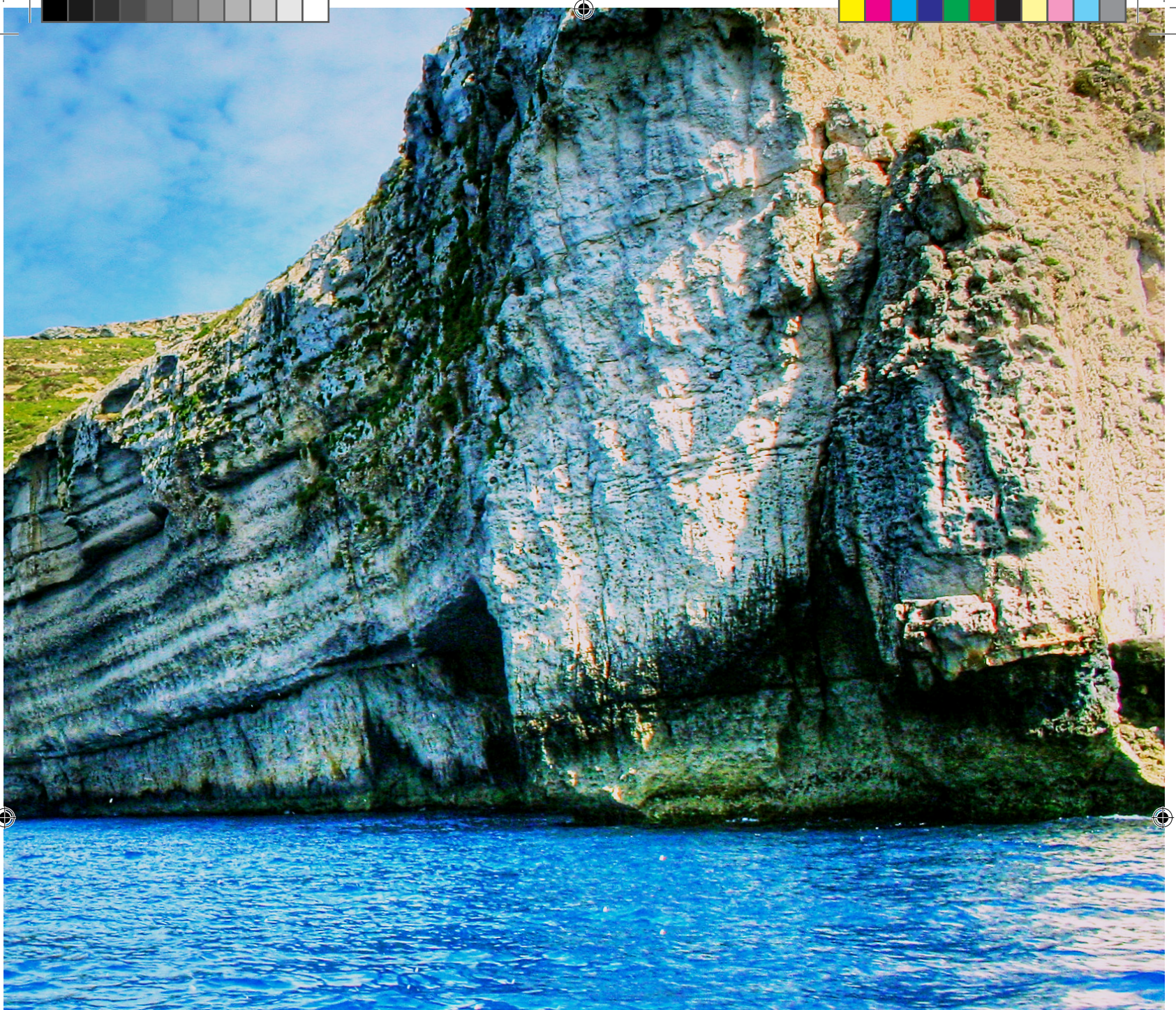
All paved areas will be properly maintained with new street furniture and an integrated lighting system.

*To pursue the plans referred to in this chapter kindly refer to the figures in chapter 11.*









## Chapter 14

# Assessment and Proposals for the Improvement of Traffic Management

Mario Ellul



## 1.0 Introduction

The village of Ħad-Dingli is located on the North Western side of the island, 7km from the Valletta. The area administered by the Local Council covers an area of 566 hectares of which 32.53 hectares consists of the village built up areas. The village has a population of 3,344 in 2008<sup>1</sup>.

<sup>1</sup> Demographic Review 2008, National Statistics Office, Malta pg 13.

The village is thus surrounded by large tracts of countryside and valleys with areas of high quality agricultural land in which the community is highly involved. The cliffs along the north western side of the village offer breathtaking views of the coastal cliffs and the island of Filfla are one of the major tourist attractions together with other archaeological sites scattered around the countryside.

The traffic flow and the condition of the road network has been analysed and issues identified have been assessed in detail and proposals made for the improvement of these locations in line with the applicable standards and specifications.

## 2.0 Policies

The North West Local Plan, prepared by the Malta Environmental and Planning Authority and approved in 2006 propose the implementation of traffic calming measures in order to improve road safety, reduce

through traffic through residential streets and town centers. Policy NWTR 3, Traffic Calming Measures proposes the implantation of traffic calming measures along Triq il-Kbira, Dingli.

## 3.0 Existing Problems and Proposed Improvements

### 3.1 Triq il- Kbira

Triq il-Triq il-Kbira as in name implies is the main road access road to the village of Ħad-Dingli and provides a link to all other secondary main roads that provide access to the village and its surrounding hamlets. The majority of the street falls with the Urban Conservation Area (UCA) which has developed throughout the centuries and thus the street layout has varying road width along its the length.

The location and frequent use of this road also makes it the 'commercial' area of Dingli with a number of shops and establishments that service the needs of the community. The primary school of the village is also located along this road. The varying street width, from 6.26m to 16.97m, the commercial activities, coupled with other transport requirements for public transport users and pedestrians along road are the cause of double and unorganised parking and uncontrolled movements at various junctions along this road.

**Figure 14.1: Photo along Triq il-Triq il-Kbira, varying street width and parking along the street.**



**Figure 14.2: Photo along Triq il-Kbira towards Dingli Cliffs having two way traffic flow and parking one side of the road.**



Three junctions, A, B and C, shown on Drawing D01/2010, along this road have been identified for improvement as these do not conform to the current standards of junction design. A detailed description of the problems at these junctions is detailed below.

#### 3.1.1 Triq il-Kbira with Triq Turretta with Triq il-Maddalena, Junction A

The existing three arm junction is located at the end of the urban area of Dingli and provides a link to two rural roads leading to Dingli Cliffs. The current (Figures 14.3-14.6) layout consist a large asphalted area with a small circular island within this space acting as a mini-roundabout. The mini-roundabout is not centred with the three arms of the roundabout and thus some drivers tend to ignore the roundabout. The absence of built traffic islands on three arms of the roundabout

and faint line makings does not contribute to better traffic flow and safety at this junction.

The space within this junction can easily accommodate a three arm roundabout having an inscribed circle diameter (ICD) of 23.6m and a circular traffic island of 7.7m as proposed on drawing D03/2010. The circular traffic island would be landscaped to improve the urban environment. The footpaths of within this junction must also be reconstructed with the configuration of the roundabout in order to guide drivers using this roundabout. An unloading bay in front Dingli cemetery is also being allowed. The loading bay shall be constructed of concrete paving blocks in order to create a distinction between the roundabout junction and unloading bay. A traffic island on Triq il-Kbira has been elongated in view of the side street that is currently being formed very close to this roundabout. The proposed signage and dimensions of the proposed roundabout junction is shown on drawing D04/2010.

**Figure 14.3: Junction A, view of the junction towards Dingli Centre**



**Figure 14.4: Junction A, view towards Triq il-Maddalena**



**Figure 14.5: Junction A, view of junction from Triq il-Maddalena.**



**Figure 14.6: Junction A, view of junction towards Triq it-Turretta.**



### 3.1.2 Triq il-Kbira with Triq it-Turretta - Junction B

The existing priority junction consists of priority junction which has a Y configuration with Triq il-Kbira being the major road and Triq it-Turretta being the minor road as shown in Figures 14.7-14.9. The existing geometrical configuration does not provide adequate guidance to drivers. In fact traffic exits from Triq it-Turretta without stopping or giving way to traffic flow from the main road whilst traffic entering Triq il-Turretta has to manoeuvre around a circular tree pit which is located within this junction. This circular tree pit also gives the wrong impression to drivers that this junction functions as a roundabout.

**Figure 14.7: Junction B view of Triq Ghar Bitija and circular tree pit.**



**Figure 14.8: Junction B view towards to Dingli Cliffs.**



The proposed layout plan consists in the re-configuration of the arm of Triq il- Turretta with Triq il-Kbira to a standard T junction layout. This configuration would provide better visibility to drivers exiting from Triq it-Turretta of the traffic along Triq il-Kbira. The proposed layout of this junction is shown on D06/2010. The new layout would also allow for the implementation of few parking spaces within this junction. The parking spaces shall also be constructed of concrete paving block in order to distinguish between the road traffic areas and the parking spaces. The proposed signage and dimensions of the proposed junction is shown on the drawing D07/2010.

Figure 14.9: Junction B, view towards Dingli centre.



### 3.1.3 Triq Il-Kbira/Triq il-Għajn with Triq Ġuze' Ellul Mercer and Triq il- Buskett - Junction C

The staggered T junction formed by Triq il-Kbira with Ġuze' Ellul Mercer and with Triq il-Buskett is one of the busiest junction as Dingli. The junction is located within a very wide road space having an average width of 12.49m and without traffic islands that guide drivers through the junction.

The minor arm of the junction, leading to Ġuze' Ellul Mercer has a trapezoidal shape with the road narrowing down from 8.22m to 5.42m and then widens again to a uniform width of 8.56m. The narrowing requires that drives slow down and give way to on-coming traffic. The right hand corner of the junction of Triq Ġuze' Ellul Mercer with Triq il-Għajn is also not splayed and thus heavy goods vehicles exiting from Triq Ġuze' Ellul Mercer have difficulty in turning towards Triq l-Għajn.

Within this junction one also finds two commercial outlets on which during various site visits, double parking was observed within the junction forcing drivers entering Dingli to overtake these double parked vehicles, causing a traffic hazard and congestion at this junction.

A bus stop, towards the direction of Valletta, is also located close to the junction. The bus stop is marked only by a flag and the bus lay-by is substandard, without any adequate shelter and facilities for Access for All. The bus stop is only 140m away from the Dingli bus terminus and should be therefore removed to improve traffic flow at this main junction.

The proposed improvements consist in the construction of kerb traffic islands in order to direct drivers through this junction, the provision of right hand turn lay-by, the organisation of parking spaces and improvements to the layout of the junction to Triq il-Buskett. The

proposed Layout Plan and the Proposed Signage and Dimensions plan is shown on drawings D09/2010 and D12/2010.

### 3.1.4 Other proposed improvements along Triq il-Kbira.

In addition to the proposed improvement of the three junctions mentioned above the reconstruction of part of Triq il-Kbira and better organisation of parking is also required. The asphalt road surface of part of Triq il-Kbira, from Triq l-Għajn till Triq il-Parroċċa, a length of 410m is in a very poor condition having severe cracking, rutting and chipping loss of the asphalt surface. The reconstruction of the section of this main access road is thus recommended to improve traffic flow and the urban environment. Some of the footpaths along this section are also in poor condition and therefore upgrading is also being recommended. During the road reconstruction and upgrading works, measures to improve accessibility for all road users shall also be implemented.

The current parking layout along Triq il-Kbira from Sqaq il-MUSEUM till Triq il-Qawsalla (close to junction B) must also better organised. The parking along this stretch is found on both sides of the road in a staggered arrangement, that is three parking spaces are located on the right hand side (church side) close to Triq San Rokku whilst parking further down, along the square of Triq il-Kbira, parking is allowed on the left hand side. Along the left hand side of this section of Triq il-Kbira there are also a number of commercial outlets and often drivers park along this section for loading and un-loading of goods to and from these shops. The current staggered parking layout and parking outside these commercial outlets is causing congestion along this section for traffic travelling along Triq il-Kbira. It is therefore proposed to organise the parking along the left hand side of the road (on the side of Sqaq Il-MUSEUM) to provide the required loading/unloading bay in front of the commercial outlets and improve traffic flow along this section.

## 3.2 Triq Misrah Suffara

### Misrah Suffara with Triq San Pawl Tal-Pitkali and Triq il-Għabex - Junction D

One of the secondary access streets in Dingli is Triq Misrah Suffara which connects the village of Dingli with a small rural hamlet of Misrah Suffara. Two junctions along this road, the junction between Triq Misrah Suffara/Triq Ghar Bittija/Triq Ġuzi Cutajar/Triq San Pawl/ Triq il-Knisja, junction 2 (drawing D01/2010) and the junction between Triq Misrah Suffara/Triq il-Merill/Triq Ġann Mari Abela, junction 1 (drawing D01/2010) have been upgraded. The upgrading of these two junctions has substantially improved traffic flow at these two locations along Triq Misrah Suffara.

Another junction along this road is in need of upgrading. The current layout consists of a large asphalted square with two residential streets, Triq San Pawl tal-Pitkali and Triq l-Għabex leading to this square, as shown of the drawing D10/2010 and figures 14.10 and 14.11. The large asphalted area does not provide proper guidance to drivers and thus the square is a potential location for traffic accidents.

**Figure 14.10: Junction D, view of Triq Misrah Suffara towards to Dingli Centre**



**Figure 14.11: Junction D view of square and Triq Misrah Suffara.**



**Figure 14.13: Bend along Triq il-Merill.**



**Figure 14.14: Part of Triq il-Merill**



**Figure 14.15: View of Triq il-Merill.**

The junction can be better improved by the construction of two priority junctions one being Triq Misrah Suffara as the major road and Triq San Pawl tal-Pitkali being the minor road and the other being Triq San Pawl tal-Pitkali with Triq l-Ghabex. The proposed alignment will also result in an environmental improvement by the breaking up of the unused asphalted areas and planting of trees and shrubs.

### 3.3 Triq il-Merill/ Triq Claudette Agius

**Figure 14.12: View of Triq Claudette Agius**



Triq il-Merill and Triq Claudette Agius is a two way ring road around a modern housing estate in the area know as tal-*Hawli* located on the north western side of Dingli. The Local Council is concerned with high speeds along this road and would like to implement traffic calming measures.

The road has varying width, from 7.14m (Triq il-Merill) to 9.60m (Triq Claudette Agius) since the housing blocks along Triq il-Merill are not aligned with each. The road was built following the building alignment of these blocks without any consideration to design manuals for

residential roads. A 1.1m footway is found on each side of the street. Parking along the street is not organised and residents parked on both sides.

The alignment of the road along Triq Claudette Agius is in a straight line for a length of 380m, thus encouraging excessive speeds at this location. This straight section is followed by a curved section which has a very small radius of 45m. The very small radius of this curve dictates a speed of 30km/h<sup>2</sup>. This section is followed by another curved section having a large radius of 200m. The road then narrows down from 9.08m to 7.90m between Triq Għar Mirdum and Triq ix-Xagħra l-Kbira and then widens up to 11.25m up to Triq Ġuże' Ellul Mercer.

Traffic calming measures need to be carried out along this road as the current road alignment and width as well as the absence of road markings and signage do not guide and assist the driver.

Various traffic calming measures have been considered amongst which the installation of rubber road humps at various sections along the road. The installation of rubber road humps along the 9m width of the road is not recommended and not allowed by the traffic management guidelines of the Malta Transport Authority. The Malta Transport Authority approves the use of such road humps in only in roads that having a road width of less than 3m.

The proposed measures along this road consists in the improvement of the alignment of the existing road within the existing road footprint, the organisation of parking on one side of the street with intermediate

---

2 UK Design Manual for Roads and Bridges, Volume 6, TD9/93 Highway Link Design, Table 3.

## 4.0 Conclusions

The current road infrastructure in Dingli has developed throughout the years with to provide the basic transport needs to the local community. The rapid expansion of the village in the last 40 years, the rapid increase in motorization coupled with the development in the science and technology for transport infrastructure and accessibility requirements for all users needs the upgrading of the existing main and link road infrastructure in Dingli.

trees and landscaped areas. The street alignment lane width proposed consists of 2.57m wide lanes with a 2.00m parking bays and a minimum of 1.1m footpath. Between the parking bays kerb planters are being proposed in order to keep the width of the street constant and defining the carriageway. The proposed improvements will reduce the existing road width and thus giving the impression to drivers of a narrow road and thus shall result in lower speeds. In addition to these improvements the installation of traffic speed signs of 30km/h shall be installed and enforced.

### Other recommendations

The following improvements are also being proposed for the improvement of traffic management within Dingli

1. The design and installation of directional traffic signs to be installed at the various junctions in order to direct visitors to the various housing areas, hamlets and other areas of historical, archaeological, ecological, and agricultural and landscape value that are located within the Local Council area.
2. The opening of the last 10m of side street Triq Dun Karm Azzopardi (opposite Triq is-Salezjani) with Triq il-Kbira street in order to provide an improved access to the housing area of Triq l-Irdum, Triq ix-Xefaq, Triq Ġuże' Ebejer, Triq Dun Xand Cortis and to Triq Misrah Suffara.
3. The improvement of the entrance to Dingli, the junction at Triq il-Kbira with Triq ir-Rabat with Triq l-Għajn by construction of footpaths, soft landscaping and better artificial lighting during the night in order to upgrade the main entrance and guide visitors through Dingli.

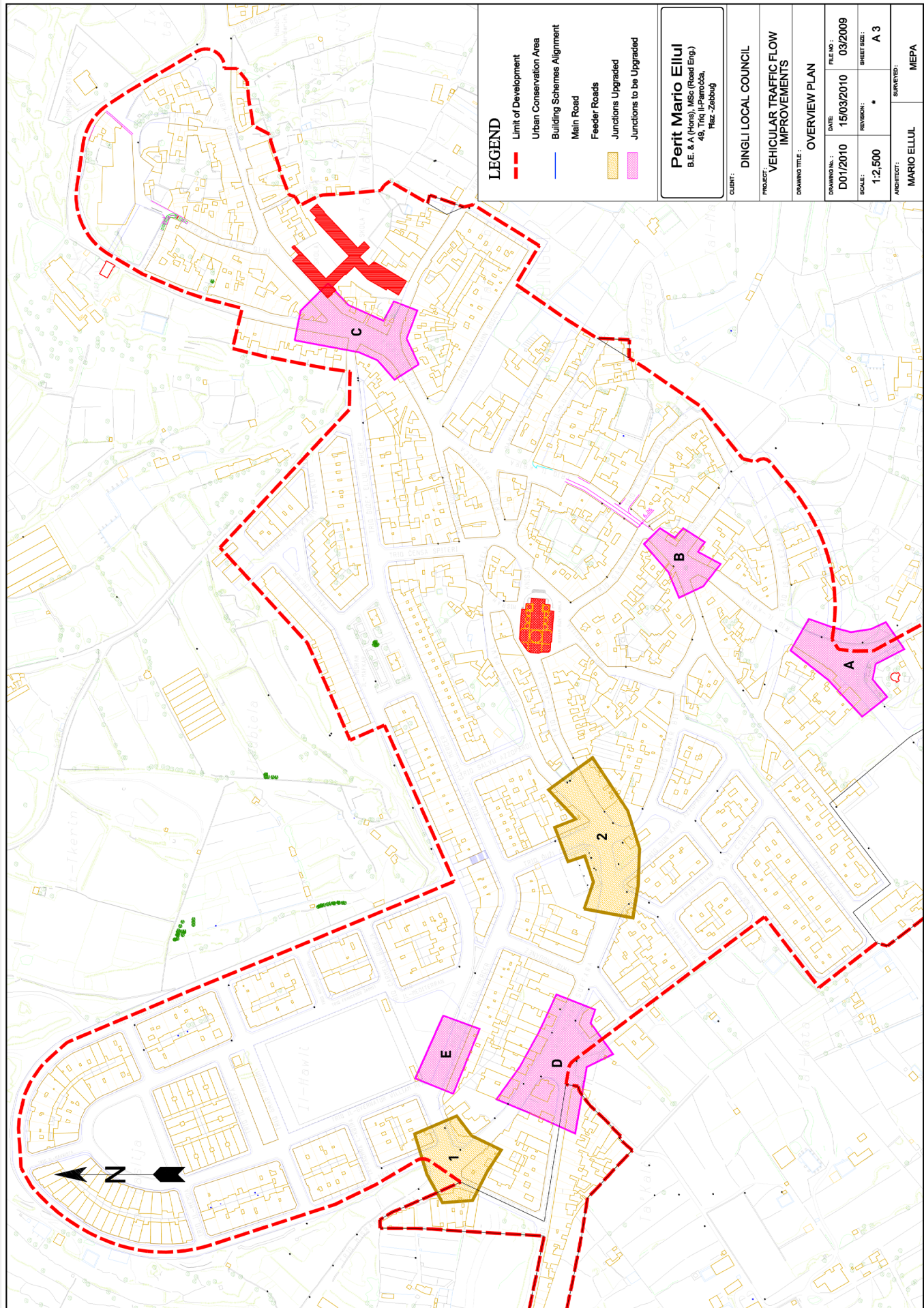
The proposed upgrading of junctions, reconstruction of the road surface, the reconstruction of footpaths, the organisation of parking along Triq il-Kbira, the redesign of a remaining junction along Triq Misrah Suffara and traffic calming measures along Triq il-Merill and Triq Claudette Agius are aimed towards the improvement of transport infrastructure. Additional measures such as directional signage and other improvements will also contribute towards the achievement of the better traffic management within Dingli.

## Appendices

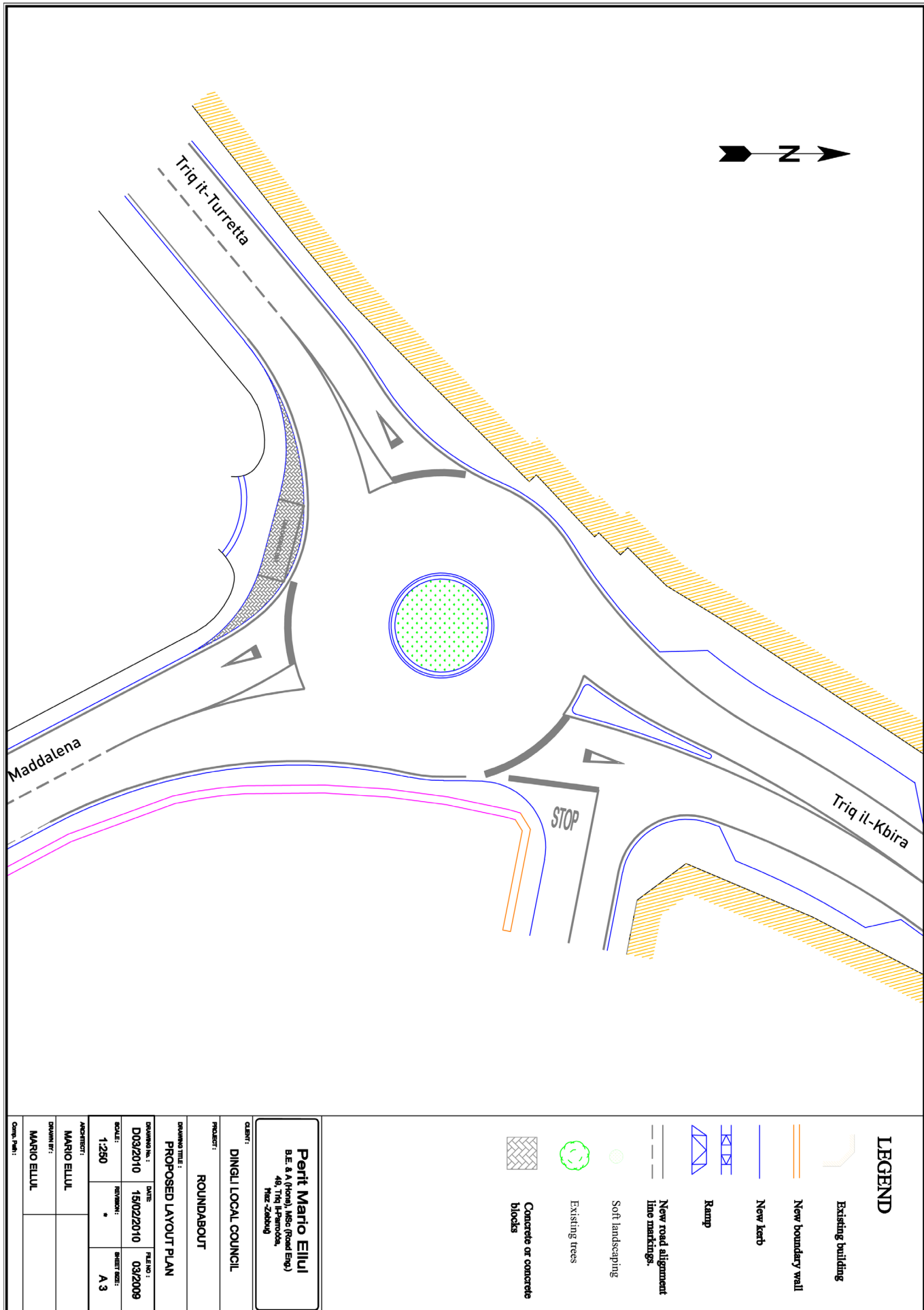
Drawing No.	Drawing Title
D01/2010	Overview Plan
D03/2010	Junction A – Proposed Layout
D04/2010	Junction A – Traffic Signs and Dimension Layout
D06/2010	Junction B – Proposed Layout
D07/2010	Junction B – Traffic Signs and Dimension Layout
D09/2010	Junction C – Proposed Layout
D10/2010	Junction C – Traffic Signs and Dimension Layout
D12/2010	Junction D – Proposed Layout
D13/2010	Junction D – Traffic Signs and Dimension Layout
D14/2010	Proposed Traffic Management Triq il-Merill



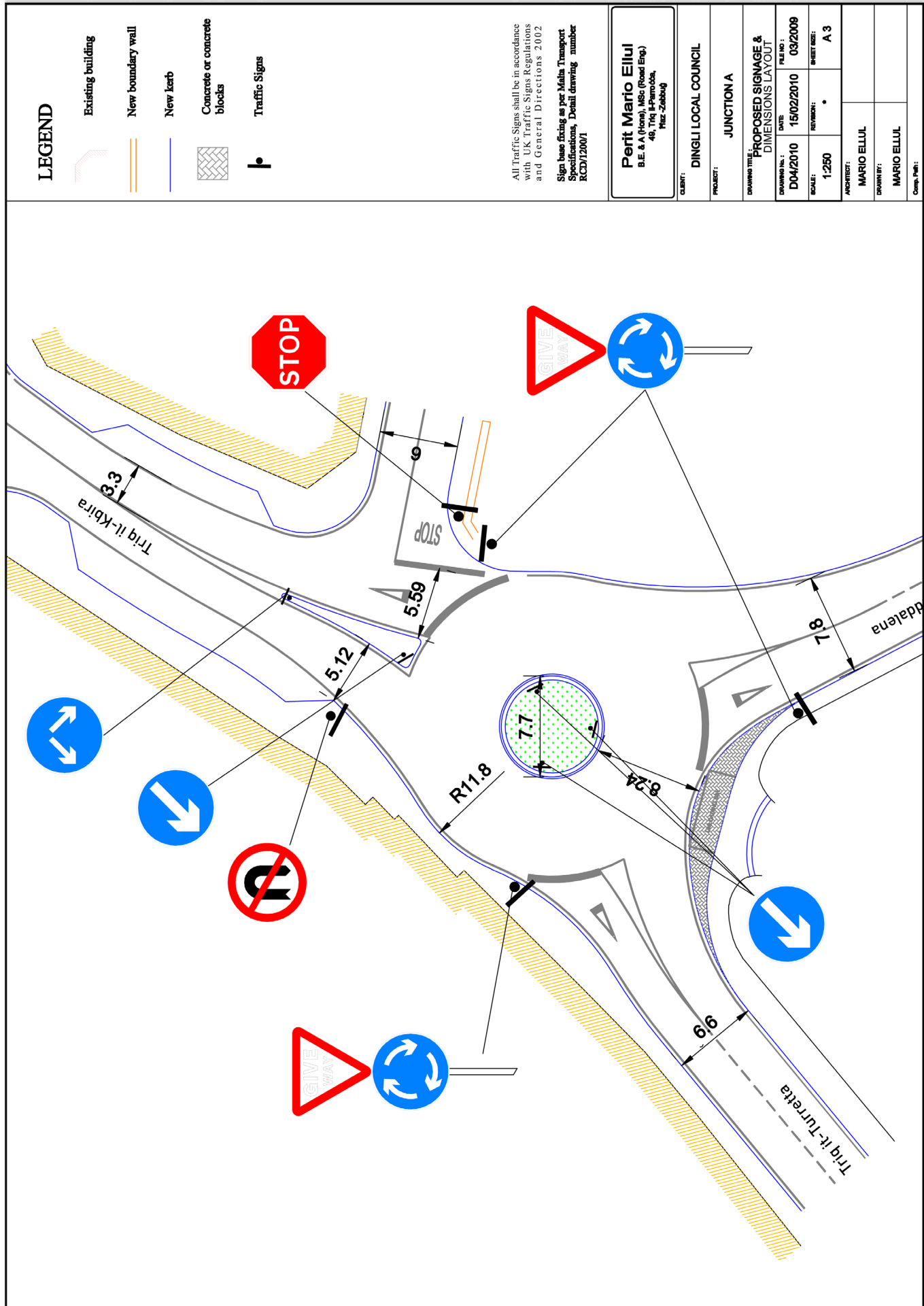
D01/2010: Overview Plan



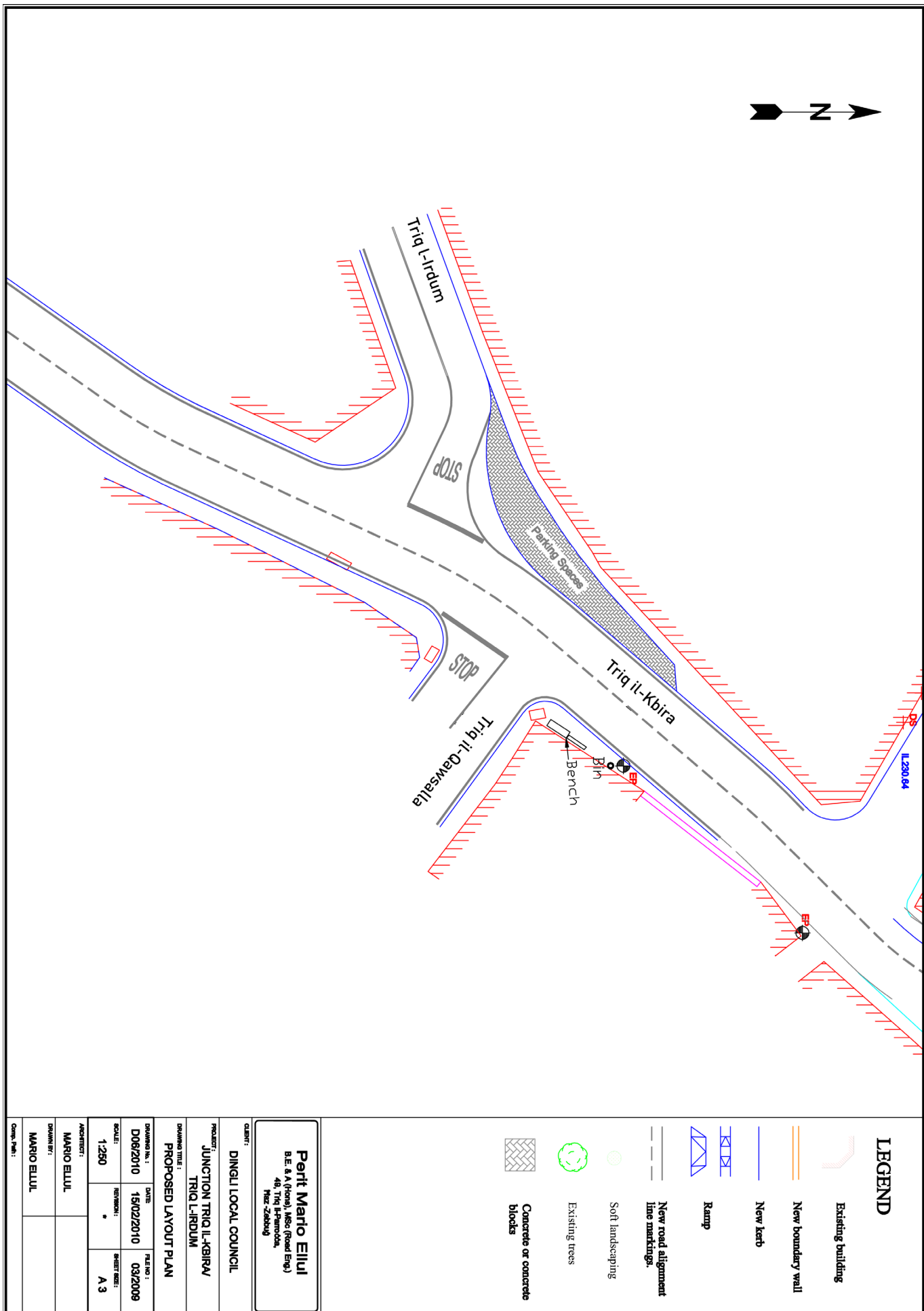
D03/2010: Junction A – Proposed Layout



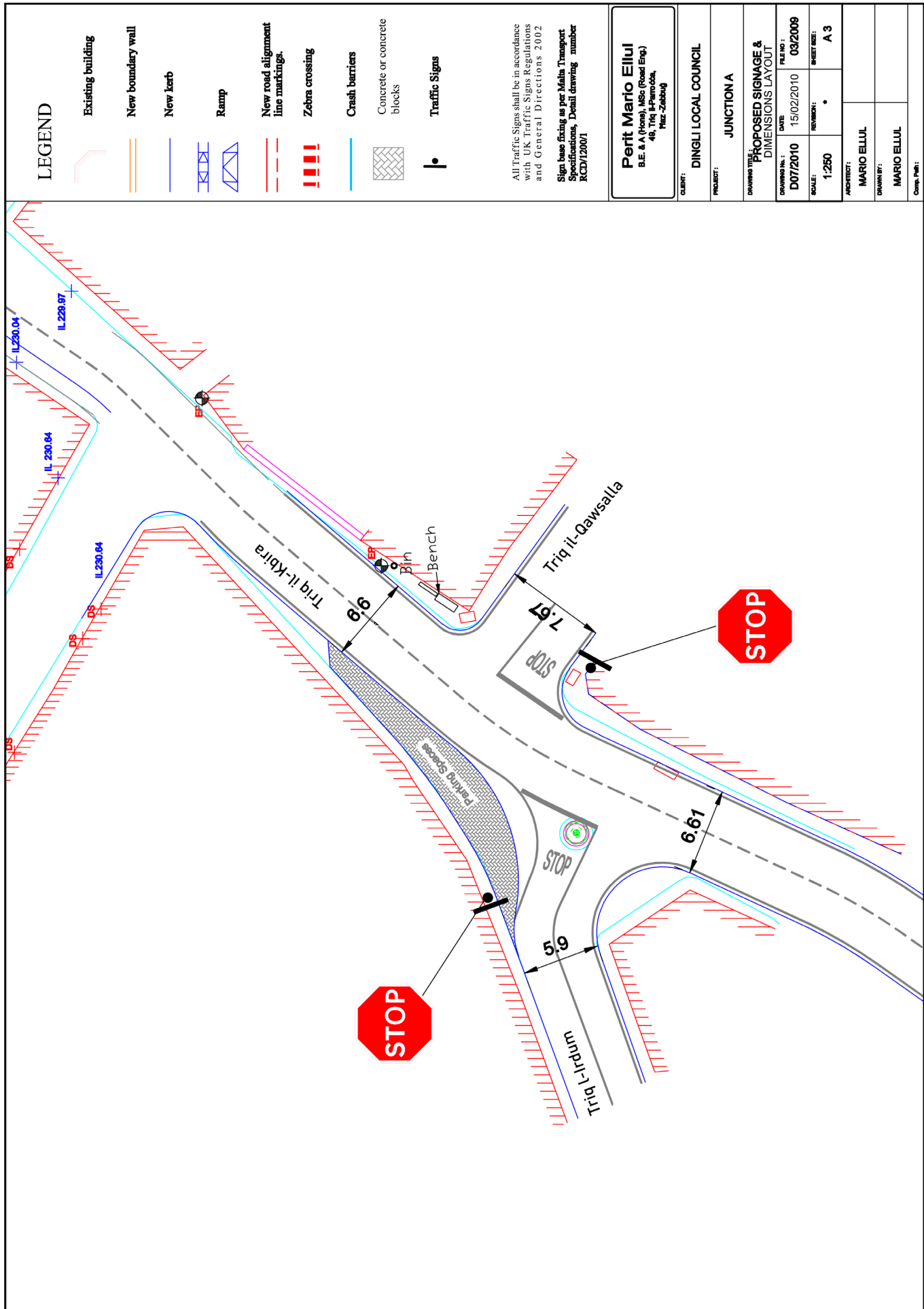
D04/2010: Junction A – Traffic Signs and Dimension Layout



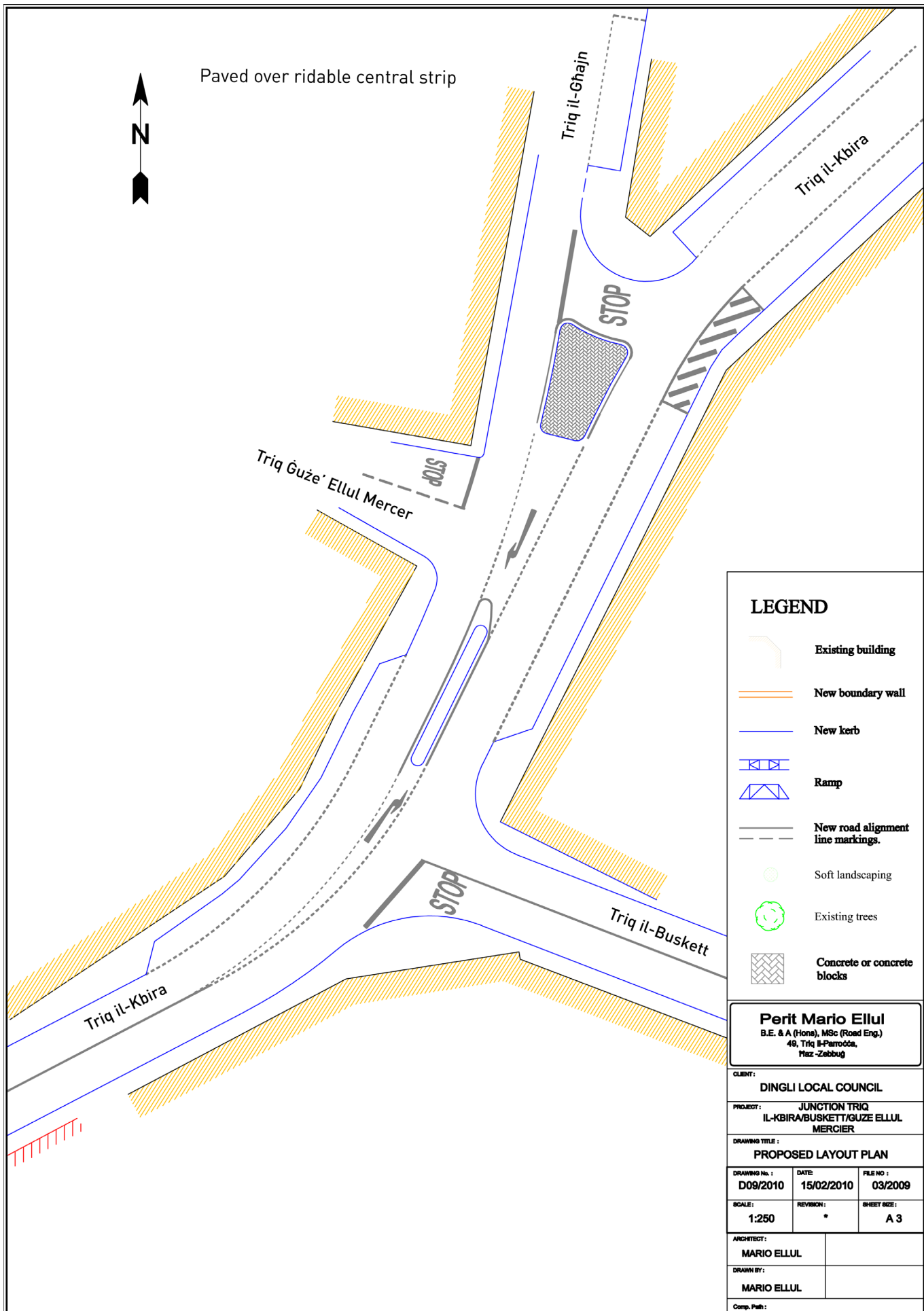
D06/2010: Junction B – Proposed Layout



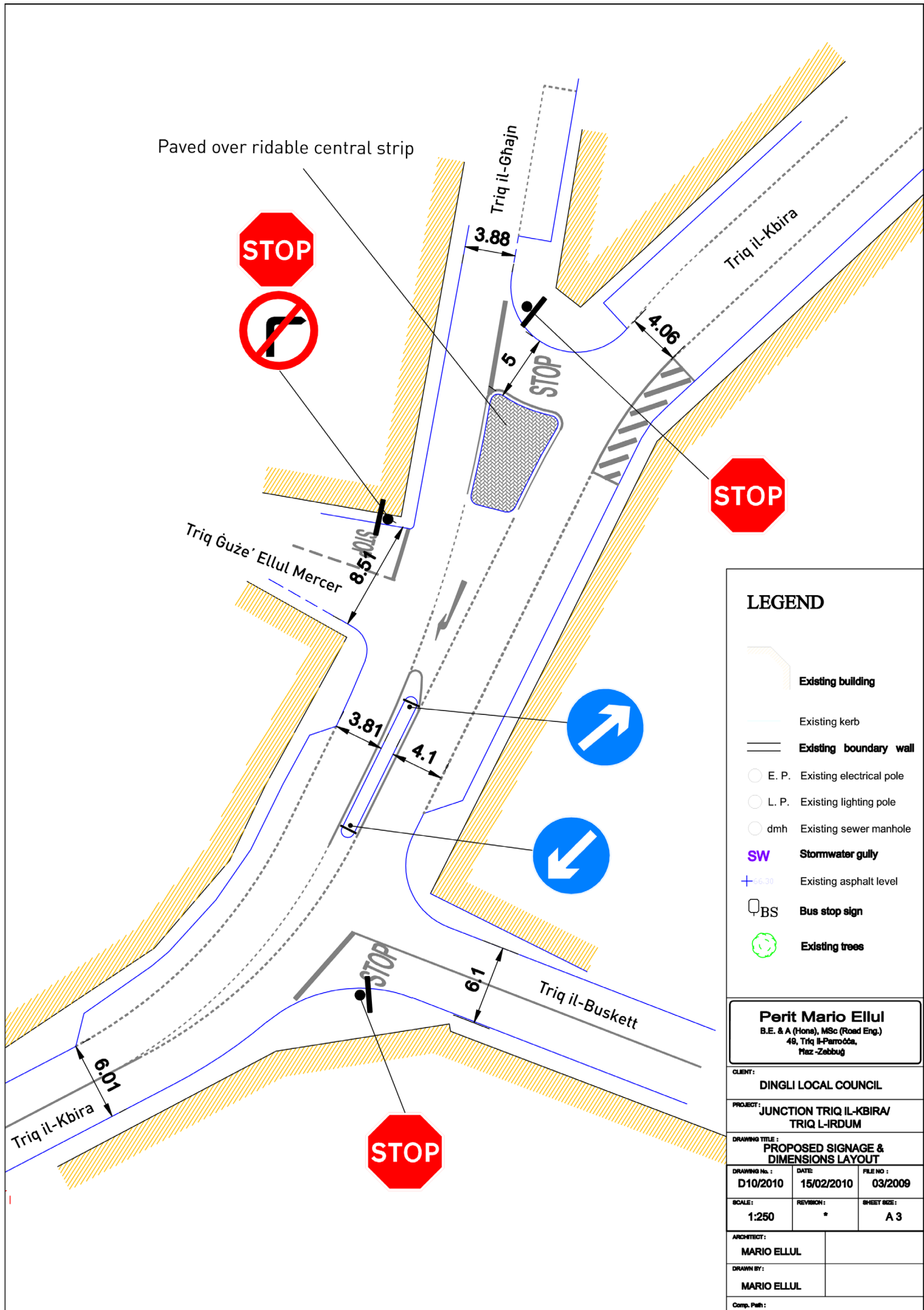
**D07/2010: Junction B – Traffic Signs and Dimension Layout**



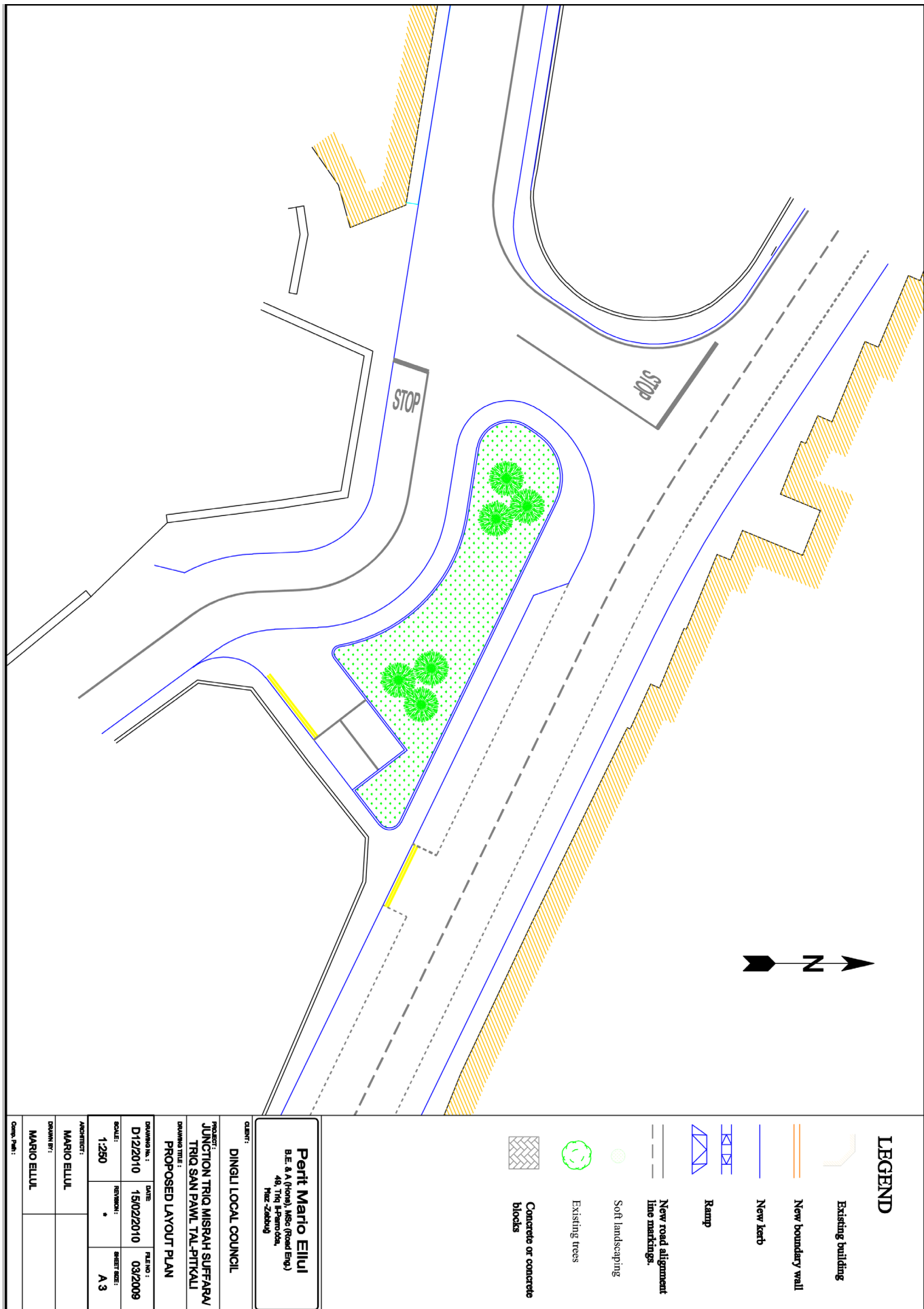
D09/2010: Junction C – Proposed Layout



D10/2010: Junction C – Traffic Signs and Dimension Layout

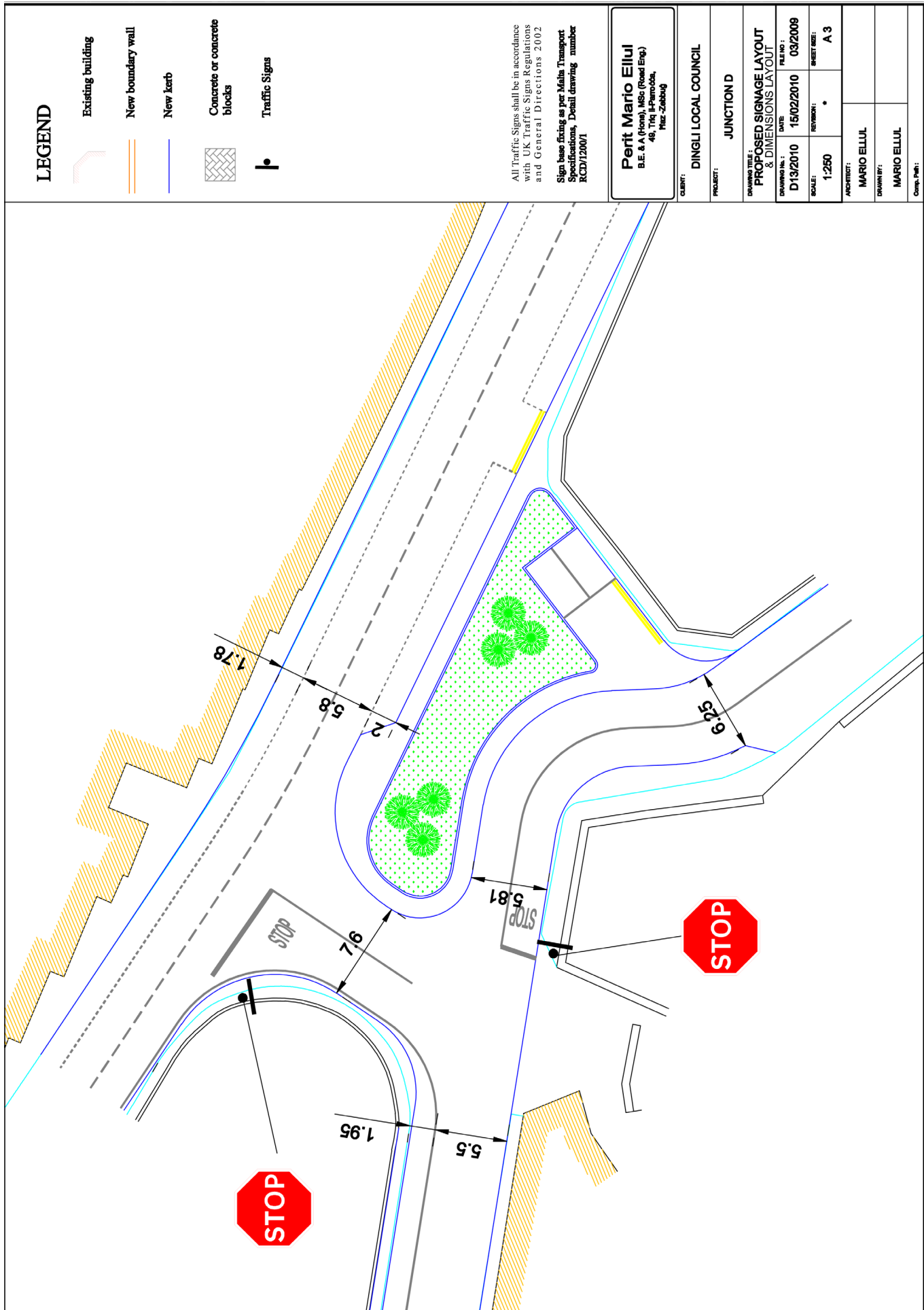


D12/2010: Junction D – Proposed Layout

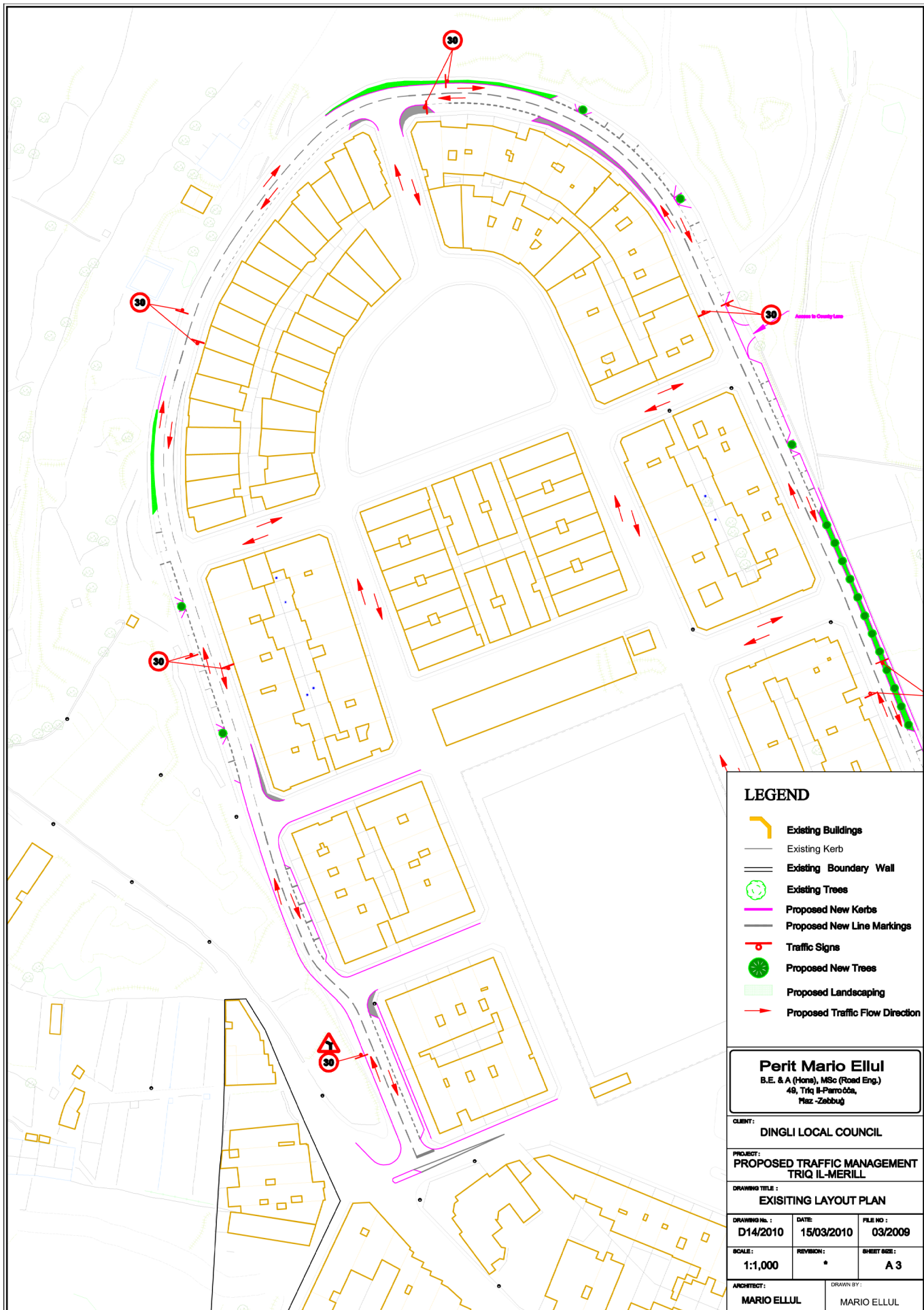




D13/2010: Junction D – Traffic Signs and Dimension Layout



**D14/2010: Proposed Traffic Management Triq il-Merill**



- LEGEND**
- Existing Buildings
  - Existing Kerb
  - Existing Boundary Wall
  - Existing Trees
  - Proposed New Kerbs
  - Proposed New Line Markings
  - Traffic Signs
  - Proposed New Trees
  - Proposed Landscaping
  - Proposed Traffic Flow Direction

<b>Perit Mario Ellul</b> B.E. & A (Hons), MSc (Road Eng.) 49, Triq il-Panoċċa, Maz-Zebbuġ		
CLIENT: DINGLI LOCAL COUNCIL		
PROJECT: PROPOSED TRAFFIC MANAGEMENT TRIQ IL-MERILL		
DRAWING TITLE: EXISTING LAYOUT PLAN		
DRAWING No. : D14/2010	DATE: 15/03/2010	FILE NO. : 03/2009
SCALE: 1:1,000	REVISION: •	SHEET SIZE: A 3
ARCHITECT: MARIO ELLUL	DRAWN BY: MARIO ELLUL	







Chapter 15

# Dingli Urban Conservation Area Upgrading Project

David Vassallo





## Brief

Towards the end of 2008, the Dingli Local Council agreed to commence preparations in connection with a major upgrading project for the central area of the village. The main aim of the project is to enhance

the overall surroundings of the village core and to create a more pleasant environment with better and safer facilities for all road users.

## Description of the area

**Figure 14.1** indicates the extent of the area being considered for the eventual embellishment project. The area under consideration extends along part of Triq il-Kbira and includes also Triq San Rokku, Misrah Ġuże' Abela, Triq il-Parroċċa, Triq id-Dejqa, Misrah Frenċ Abela and Triq il-Kuncizzjoni (refer to map below).

branching outwards as is typical in old Maltese villages. Apart from the main church the area includes the main social and political clubs, the police station, the post office, banking facilities, a youth centre and the main public terminus. The area is very well integrated with a number of shops and other facilities.

**Figure 15.1: Site Plan**



The area considered is the main hub of the village with the main parish church acting as the main focal point and with narrow streets

**Figure 15.2: View towards the main parish church**



## Planning considerations

Map 68 from the approved North West Local Plan indicates that the area earmarked for improvement is designated as the 'Local Centre for Dingli' per policy NWCM2. The area forms part of the Dingli Urban Conservation Area with a maximum building height of 2 floors plus recessed floor as per Map 69 of the above mentioned Local Plan.

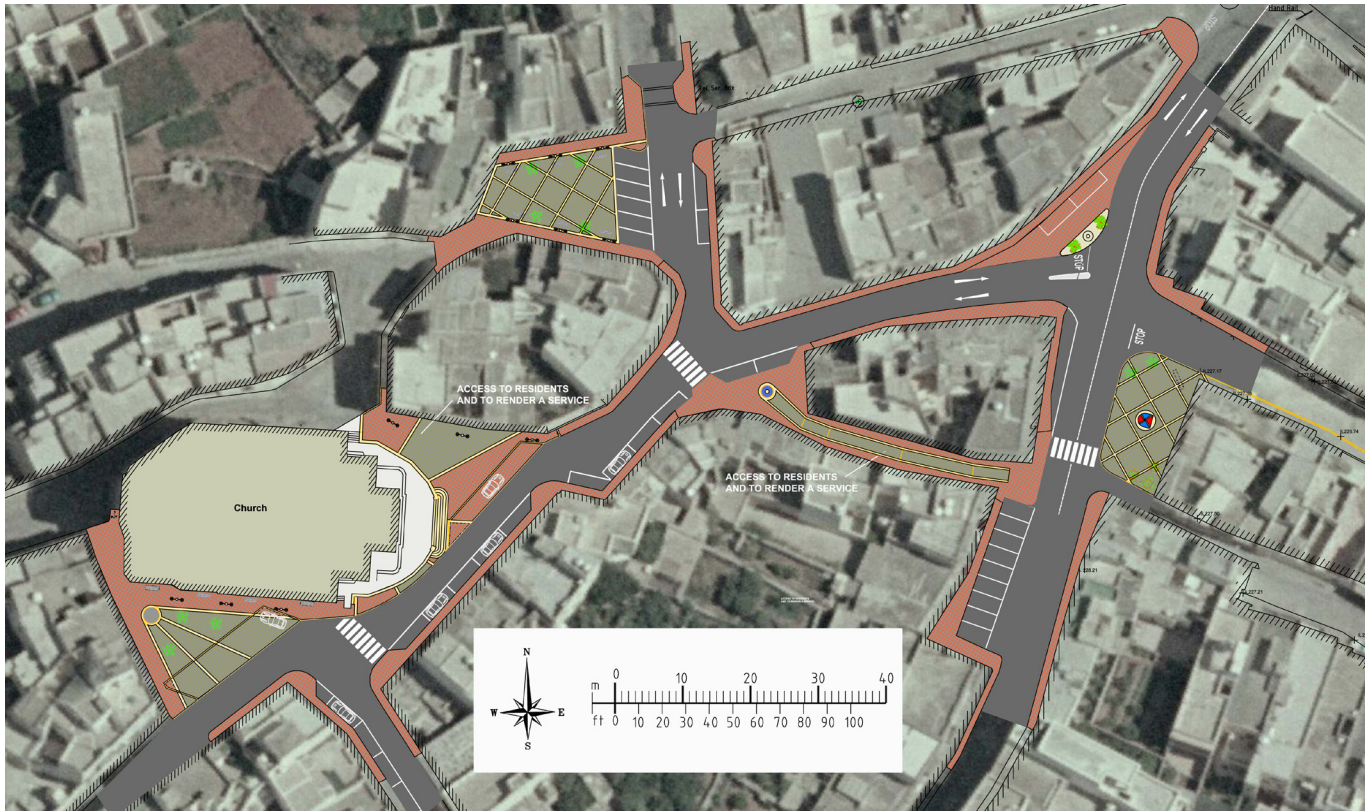
The village core includes various typical architectural features, most notably various niches located on private buildings.

## The Project

Indicates the designated area divided into three main zones where the works will be carried out. The main works involved includes the

pedestrianisation of open spaces, the upgrading of infrastructural works and resurfacing of the main streets.

Figure 15.3: Zoning of the project



The pedestrianisation of small pockets of open spaces includes the main areas around the church, Misrah Frenč Abela, Triq id-Dejqa and an open landscaped space in Triq il-Kbira as indicated in Figure 14.3. These areas will be properly paved with lava stone and new street furniture and light fittings will be installed. The general landscaping of the area will be improved with proper species of plants and vegetation.

The upgrading of the existing infrastructure will include the removal of all cables and wires from the existing facades in order to clean up the overall outlook of the streetscape. This process involves the construction of a number of underground culverts for the passing of electrical installations, water ducts, data cables etc...

The remaining streets will be resurfaced with hot rolled asphalt. The main focus will be on resurfacing Triq il-Kbira which is currently in a very bad state. The newly resurfaced areas will include the upgrading of the existing off-street parking with new road markings clearly indicating the road carriageway and the implemented traffic schemes.

This will run parallel with a new traffic management plan that is currently being drawn up for the village's urban core. The new plan will be implemented following thorough discussions and eventual approval by the Malta Transport Authority.







“Għandna nżommu għajn waħda fuq il-progress,  
u l-għajn l-oħra fuq il-konservazzjoni.  
Infatti progress u konservazzjoni flimkien jagħmlu l-vera ċiviltà”

Francis Ebejer, iben Ħad-Dingli

