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SUSTAINABLE DEVELOPMENT

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INDONESIA AUSTRALIA BUSINESS COUNCIL

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PROLOGUE

- The Universal Scale & Sustainable Development
- Tragedy of the Commons → Collapse of Civilisation → Today's Issues
- The tragedy of the commons

  " ... Living wihin a finite world, encapsulated by the universal image of the earth seen from space ..."

PROLOGUE (Cont'd)

- Tragedy (Greek) ~ an inevitable consequence of actions

The scene:

a) Finite nature of the world
b) Biological energetics of human survival
c) Difficulties in defining optimum populations
d) Complexities of quantifying standards of living
e) Questioning the desirability of total individual freedoms

Imagine an unfenced pasture open to all – a common!

BALANCE OF WATER, FOOD AND ENERGY

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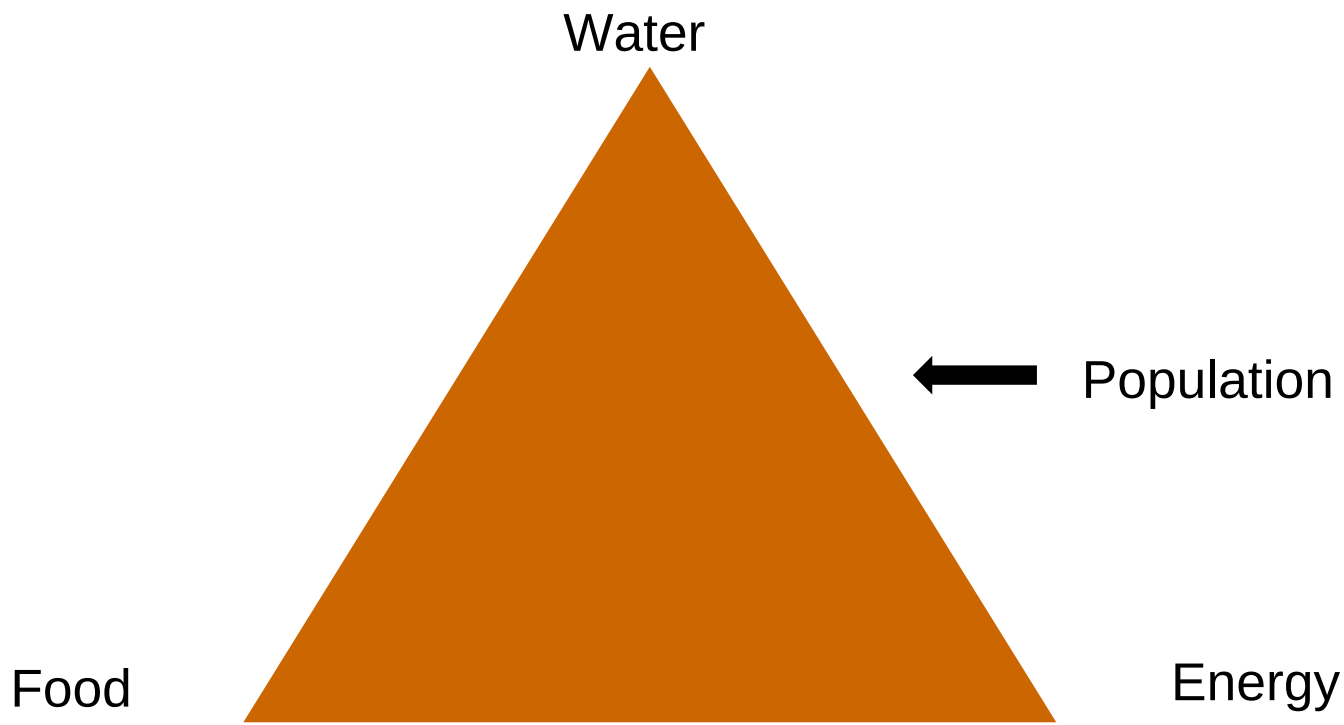

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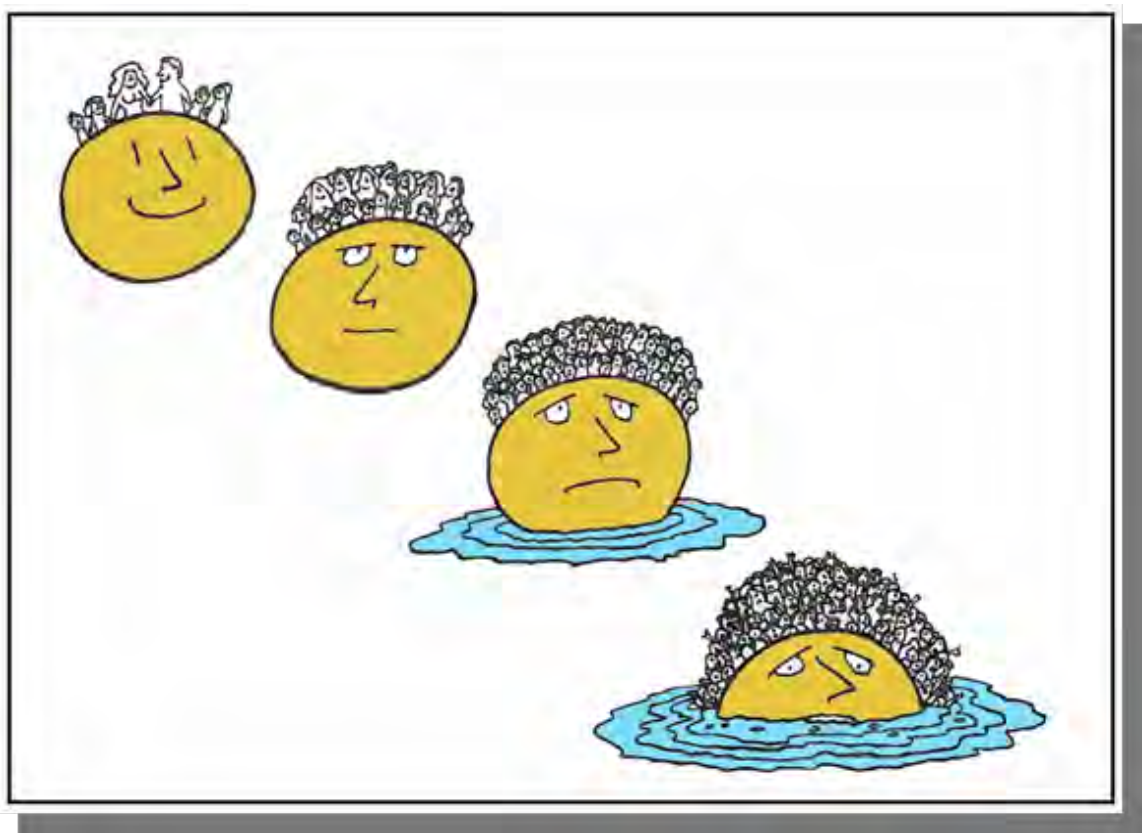
POPULATION



Source: New York Times, 7th November 2011

POPULATION : Indonesia

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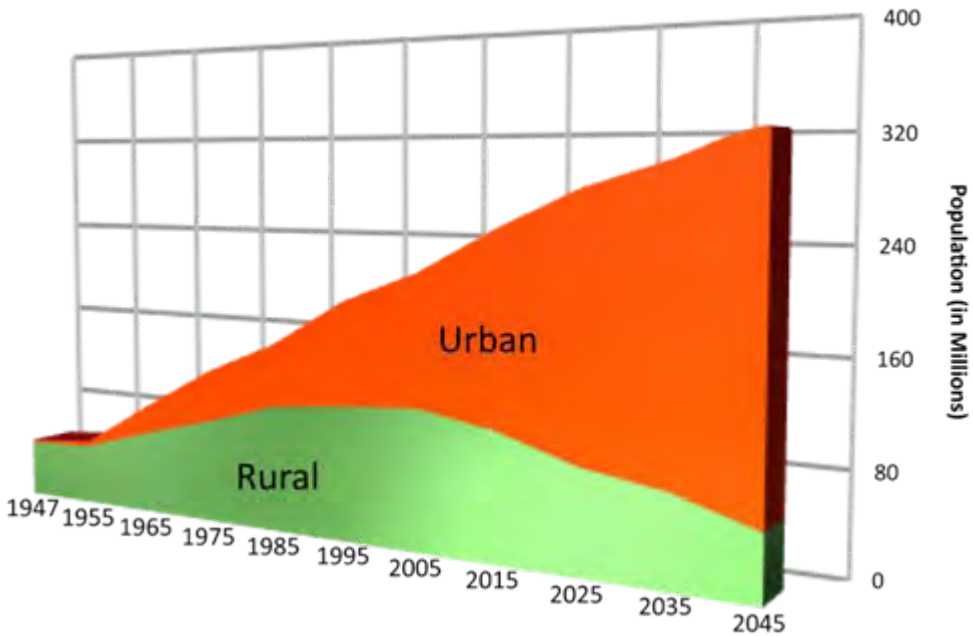

Figure 1. Indonesia Population 1940 – 2045

Population Growth with time

2008 : Urban / Rural ratio ~ 50/50

2030 : Urban / Rural ratio ~ 70/30

Region	Population	%
Sumatera	48,504,717	22%
Java / Bali	140,643,520	60%
NTT / NTB	8,842,789	4%
Kalimantan	12,618,693	5%
Sulawesi	16,403,378	7%
Maluku / Papua	4,955,939	2%
TOTAL	231,969,035	100%

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POPULATION : Urbanization

- Significant changes to expanding urban environment which needs immediate attention.
- A key feature of urbanization is impact on water demand profile – specifically in Java and Sumatra where population density is high.
- Population density of Java exceeds 982 persons/km^2, while the total for the country is only 118 persons/km^2 – and is much less in remote areas.
- Differing solutions for densely populated areas compared with those with sparse populations.

LIFE EXPECTANCY AND INFANT MORTALITY

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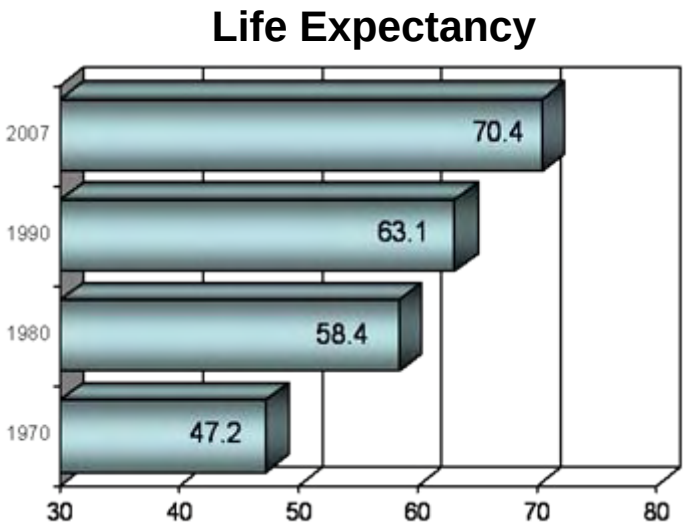
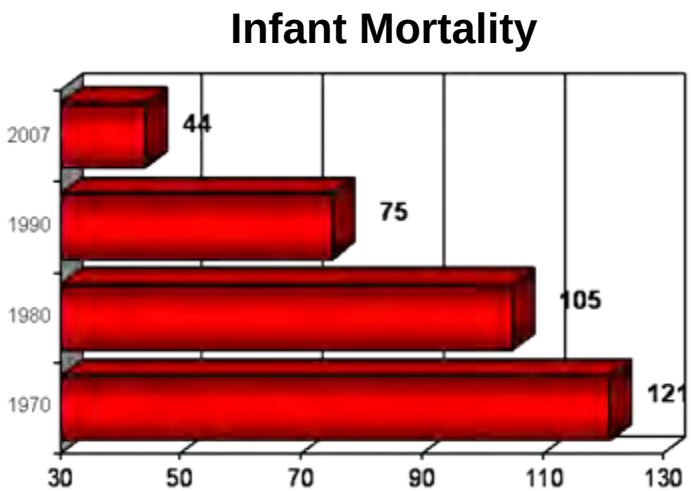


- Improved 50% from 1970 value of 47.2years
- Still have many improvements to achieve in health standards compared to a developed nation
- Ranks at 131 out of 178 surveyed nations

Note: In developed countries significant numbers will live to 100 years by mid-century)

Figure 2. Life Expectancy in Indonesia

Source: WHO Health Report on Indonesia + Indonesian Health Department March 2008



- Improved 50% from 1970 value of 47.2years
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Figure 3. Mortality Rate in Indonesia

Source: WHO Health Report on Indonesia + Indonesian Health Department March 2008

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SUSTAINABLE DEVELOPMENT

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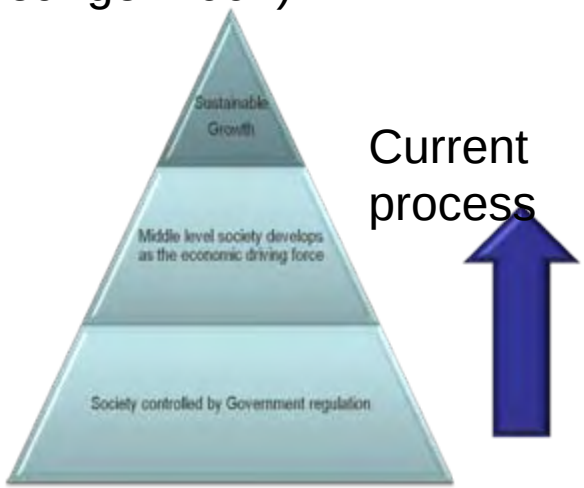
Definition:

The development and utilization of natural resources for economic growth with the exploitation of those resources held compatible with sensible conservation of the environment such that future generations are not impoverished .

(Younger 2007)



Current process

Control Process

(Need both)

Desired process

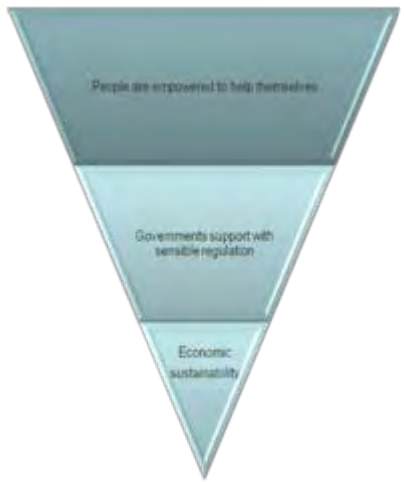


Figure 4. Development Controlled by Central Government

Figure 5. Sustainability with Emphasis at Community Level

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JURISDICTIONAL STRUCTURES

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Table 1. Levels of Jurisdiction

No	Level	Responsibility	Execution
1	Mega	Global	UN, IPCG. WTO. etc
2	Macro	National	Cental Gov't –Cabinet, Legislature, Planning & Line Ministries
3	Meso 1	Provincial	Provincial Governor, Local Legislature, Provincial Gov't Office
4	Meso 2	District / City	Regent, Mayor and Legislature
5	Micro 1	Village /	Village Representative
6	Micro 2	Personal	Personal/Family

- Four interacting areas concerning the governing of a society: social, economic, environmental and political (SEEP).
- Current process in many countries (including Indonesia) is broadly top-down form of governance, while a more desirable process for regional growth is placed on a bottom-up approach.

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JURISDICTIONAL STRUCTURES (Cont'd)

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Table 2. Sustainable Development at Meso Level

- Leadership and Bureaucracy
- Budget –Allocation
  - Operations & maintenance
  - New development

Table 3. Sustainable Development at Micro Level

- Usually starting from low base (poverty)
- Engaging and empowering
- Requiring holistic solutions
- Structuring and Scheduling Development
- Health: Access (if required); learning/teaching (education) approach
- Improving & Forming Family / Community structures – self enterprise Community growth.

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JURISDICTIONAL STRUCTURES (Cont'd)

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Table 4. Importance of SEEP Issues

No	Level	Social (1)	Economic	Environmental	Political	Comment
1	Mega	b/c	a	a	a	Umbrella
2	Macro	b	a (2)	b (3)	a	Top-Down
3	Meso	a/b	a/b	a/b	a/b	Condition
4	Micro	a	b/c	a	a	Bottom-Up

Note:
(1)Includes religion Issues
(2)Measured as macro-economic indicator e.g. GDP
(3)As usually perceived, climate change could raise important issues in some jurisdictions

a. Essential
b. Important
c. Less important

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ALLEVIATING POVERTY: A Rural Case

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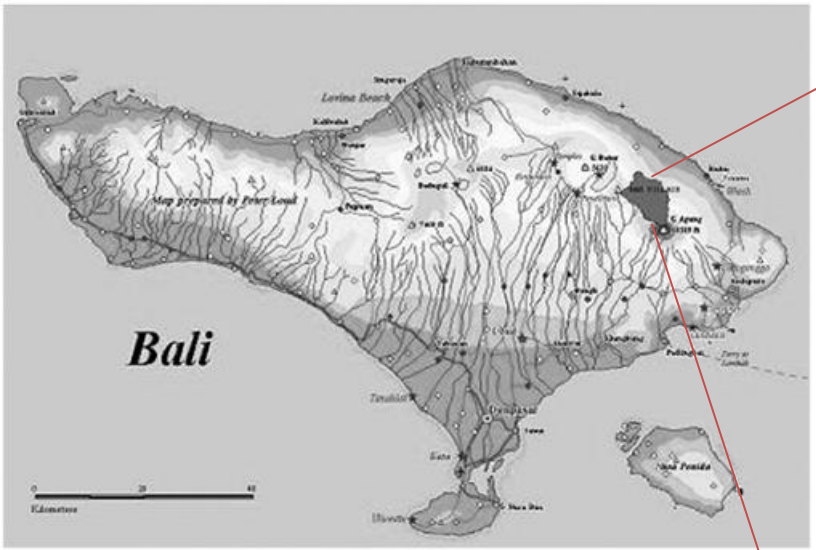

Figure 6. Map of Bali (left)

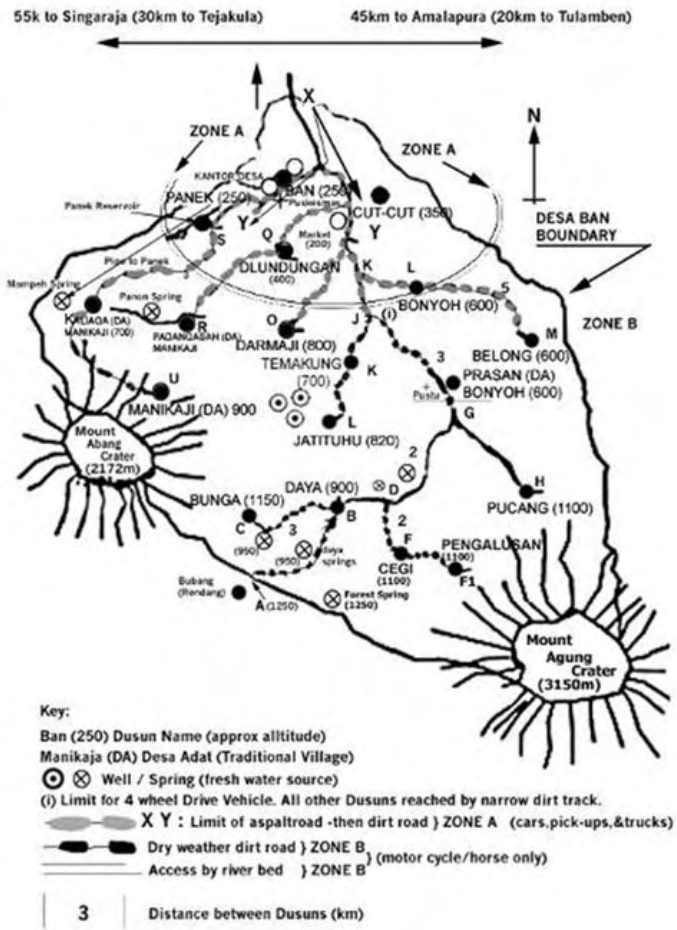

Figure 7. Layout of Desa Ban (right)

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ALLEVIATING POVERTY: A Rural Case (Cont'd)

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Figure 8. Aerial photograph of terrain for communities at higher elevations (above)

Figure 9. Conditions of People at the Beginning (right)

Iodine Deficiency Disorder and cretinism (top)
Endemic impertigo affecting children (bottom)

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ALLEVIATING POVERTY: A Rural Case (Cont'd)

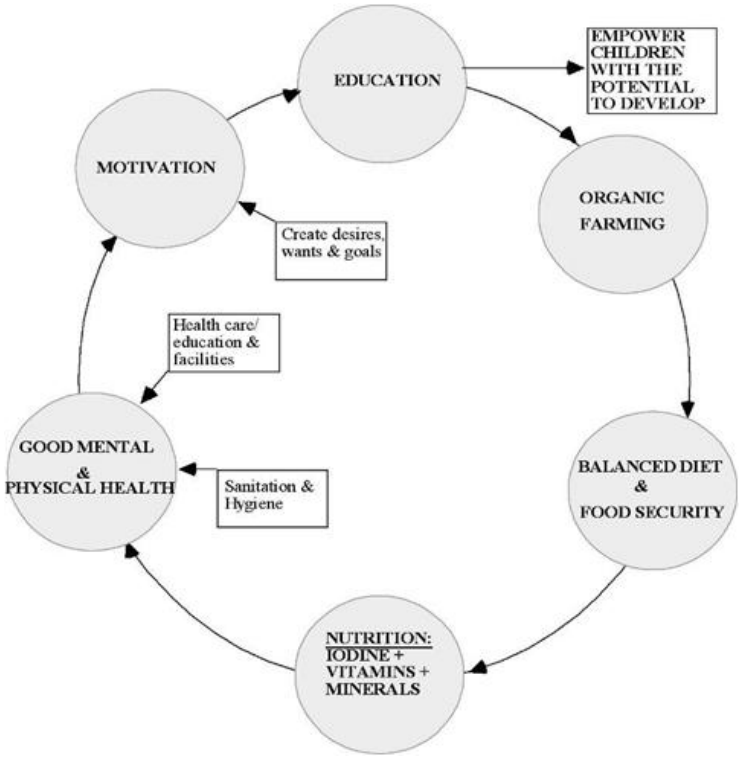

Figure 10. Virtuous Cycle for Sustainable Development

Figure 11. Stages of *Cubang* Construction for Typical Hamlet Family of 5 People

ALLEVIATING POVERTY: A Rural Case (Cont'd)

Figure 12. Pipe Laying Across Dirt Road for Supplying the Community Reservoirs from Mountain Spring

ALLEVIATING POVERTY: A Rural Case (Cont'd)

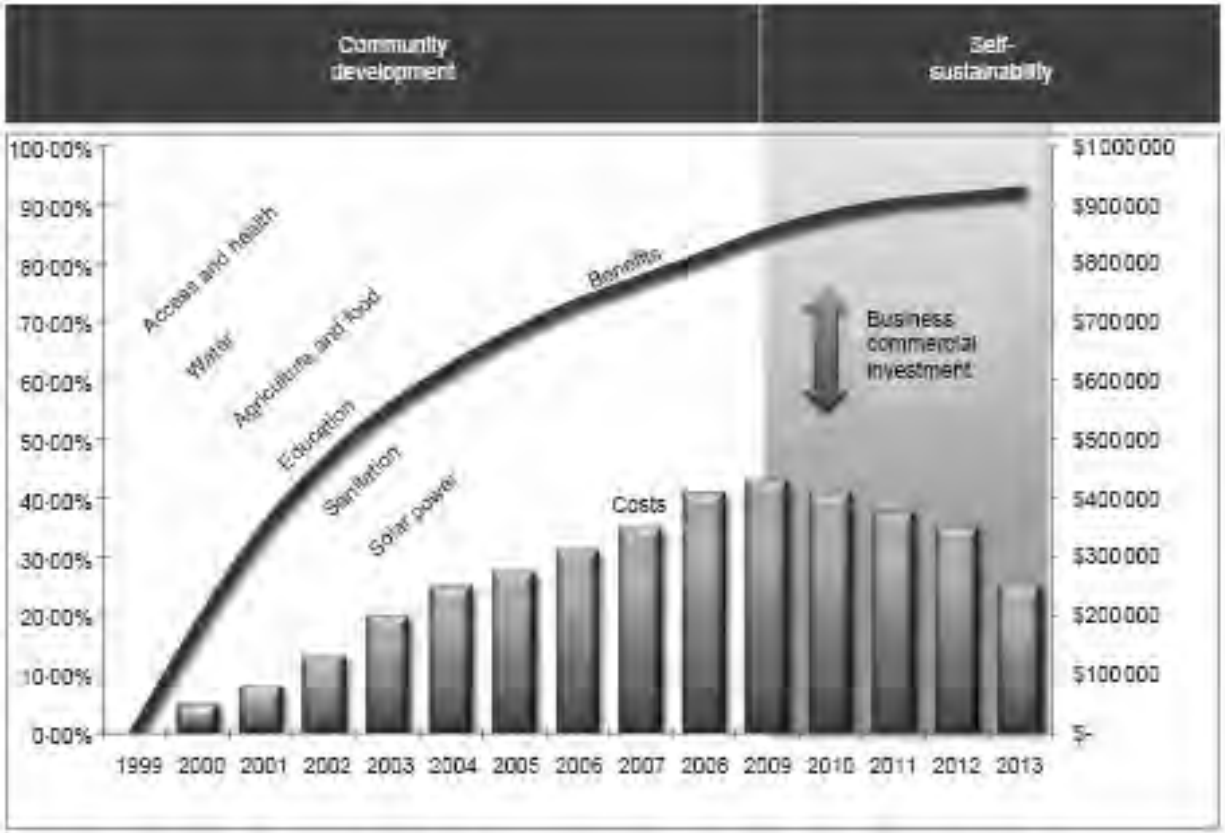

Figure 13 Profile of Cost and Development at EBPP (15,000 people)

ALLEVIATING POVERTY:
The Peri-Urban Challenge

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- Peri urban problems have become a major issue worldwide with large population growth and rapid urbanization – affecting areas of Jakarta, for example, usually (not exclusively) along river banks.
- While there will be significant and steady increase in middle-class numbers, there will also be an expansion in the numbers at the lower income level.
- When catering for property demand at the higher end of the social scale, there will be a substantial requirement to accomodate a growing number of people at the bottom end of the social scale.
- Provision of low lost housing is a serious responsibility for the city government and a politically sensitive issue for the central government. City of Jakarta has drawn up plans for low cost housing with mid rise structures included in the mix.
- During the 20th century, the developed world had a massive rebuild programme to overcome the depredations of WWII and earlier waste issues from the industrial period – with many socio-environmental mistakes and distinctly variable construction standards in the haste for rapid construction

ALLEVIATING POVERTY:
The Peri-Urban Challenge (Cont'd)

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- The overriding lesson that later 20th century planners and developers had to learn was the need to involve the community in the resolution of new works, not just in provision of basic hard infrastructure.
- For succesful development at the lower income level and to encourage communities to not only look after their areas of responsibility in soft and hard infrastructure, the social infrastructure has to be properly defined in a holistic manner.
- Properly carried out, this can provide the foundation for a community to better itself and take pride in so doing.
- In principle the problems and solutions do not vary in substance from those for rural community development; in either case the emphasis is on bottom up development, with empathetic care and assistance provided by mid-level government.
- When planning and developing a peri-urban or lower income development, it is important that plans and execution take a fully integrated approach with the communities being a wholesome part of the decision – making processes.

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CITIES AS A FORCE FOR GOOD

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- The concept of the “City as a force for Good’ or CFG, is comparatively new and has evolved from an attempt to encapsulate something of the benignity of sustainability. The essential challenge of CFG is therefore:
  - How can a city’s water infrastructure be re-engineered to restore the natural capital and ecosystem services of the nature that occupied the land before the city?
  - How can urban infrastructure be re-engineered to enable the city to act as a force for good, deliberately to compensate for the often negative impacts of the rest of man’s iterventions in nature, such as, for example, the non-urban structures of dams and diversions for agricultural irrigation?
- The critical importance of water is highlighted – how a city handles its water infrastructure is key to its sustainable future.
- BAPPENAS have thought of implementing a permanent solution to the steadily sinking north of the city through the construction of a long protective sea wall and the locking in of fresh water as a basis of water supply for north city developments

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SUGGESTED WATER SUPPLY FOR FUTURE JAKARTA

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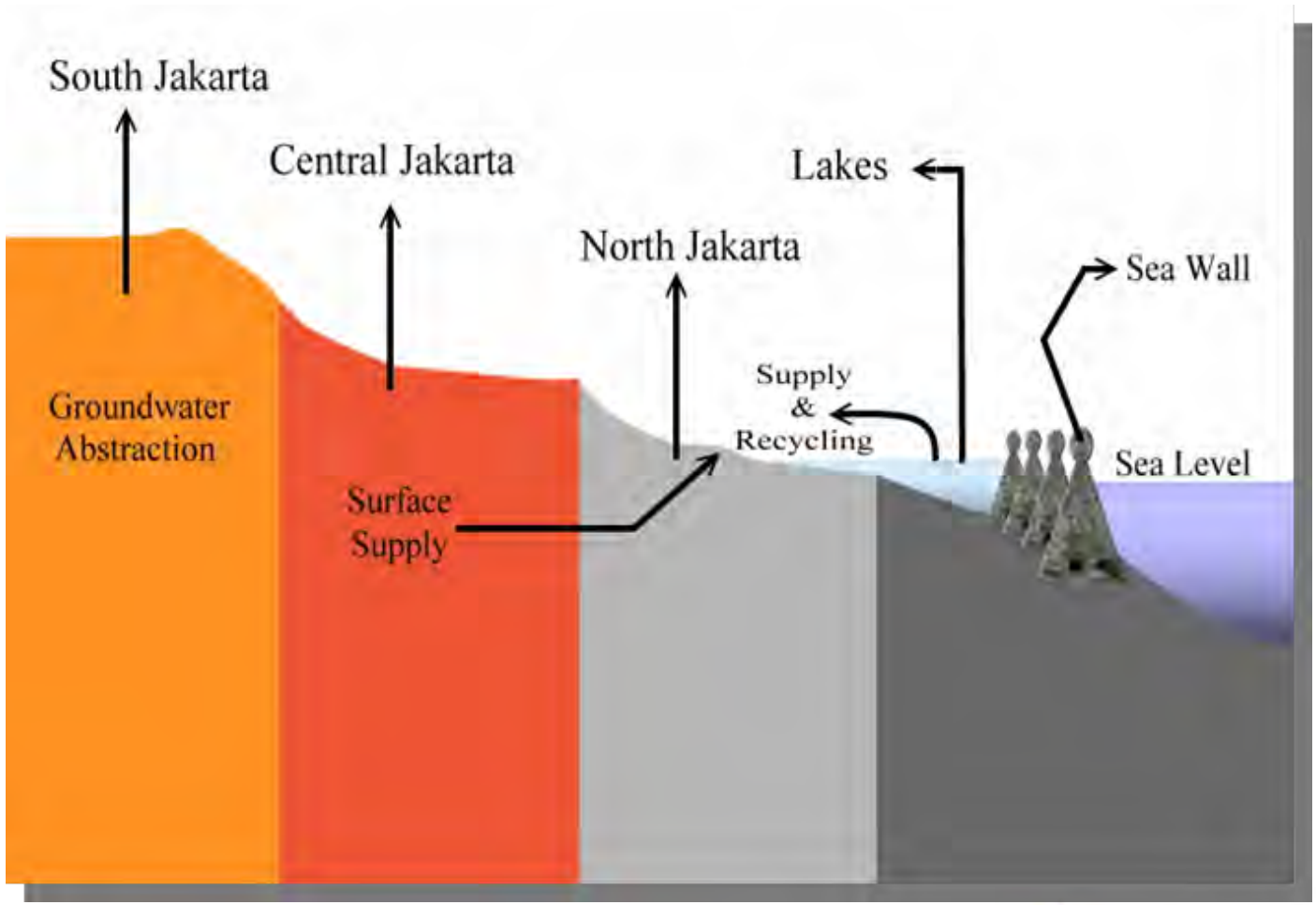

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CITIES AS A FORCE FOR GOOD (Cont'd)

- The captured fresh water can be treated and provide the basis of water supply for housing and commercial developments that already exist and which are or could be planned for the north area of the city.
- The BedZED project in London, was designed to take on board a fulsome sustainable development approach to a new residential community.
- Much was learned both good and unsatisfactory from the Project, and it serves as a basis for further future energy efficient developments. The key features and recommendations put forward have been:
  - Most of the problems in the project related to contractual and commercial issues and the administration structure adopted.
  - Vital to understand the water supply-demand balance of the development.
  - Need to develop a nationally accepted green water quality standard applicable to non-potable water systems.

CITIES AS A FORCE FOR GOOD (Cont'd)

- The other key areas for sustainable cities concern energy demand and how to make very much more efficient use of energy; and transportation.
- Both the water and power considerations can be integrated into a master plan that should follow the new Green Building Code, with energy use balance, and application of comparatively new concepts to deal with solid waste for use as fertilizer (Hydroponic vegetables).
- With regards to sanitation, the thinking for treatment in the future is moving away from main line major treatment works.
- In summary, all this is still only largely not much beyond the concept stage and considerable work is required to take these ideas to fruition – But it is time to start thinking more strategically while incorporating solutions to the many environmental problems that currently exist and building them into a long term condition of sustainability.

DESIGNING FOR SUSTAINABILITY

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- The discussion has primarily concentrated on sustainable development, the issues and the importance of engaging society in solutions.
- The type of professionals needed to play an influential part in hard and soft infrastructure development and in the sustaining of it would need a completely different form of education from that considered appropriate a half century ago.
- There is interesting work going on across the world wherein engineers and architects are now designing today's structures with efficiency in use of energy and water as the underpinning principles in the design.
- This work will attract a different approach with neutral energy balance as the underwriting principle.
- This new "specialist" professional is in contrast to the sustainable development generalist dealing with the "messy" problems referred to above, and equally needs a different training to that served in the 20th century.

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CONCLUDING REMARKS

- Sustainable development and sustainability have only become fashionable ideas over the past 20 years.
- A combination of huge population expansion over the past 60 years in parallel with advances in medicine has put large pressures on resources, and led to many arguments as to the sustainability of the way we live.
- In the past decade there has been increasing interest and practical demonstration on how the manner in which we live can be much more efficiently undertaken. Solutions usually need to integrate several technologies, along with social factors, and there remains much to do in this process and its management.
- Population expansion has led to greater numbers of the world population in poverty, a problem that mankind has never seemed able to resolve.

CONCLUDING REMARKS (Cont'd)

- The argument is presented that alleviating poverty and working towards sustainable development at the poorest end of society requires the energy and enthusiasm of these communities – and results can be quite spectacular.
- Water resources, their use, and rapid urbanization are live problems of today and all fit into the need to find sustainable solutions for human living in the years ahead.
- Protection of water resources is fundamental to optimising food production.
- The pressure will be particularly felt over the next half century, although delay in taking action at this juncture to address problems will cause an unnecessary stress on use of resources and greater costs.

CONCLUDING REMARKS (Cont'd)

- The expertise to manage sustainable development that we need in the years ahead requires a different approach to advanced education and training than adopted for most of the 20th century.
- The huge ability of computers to tackle very complex problems now offers the opportunity to provide a solid foundation to the solution of complex problems in sustainable development and sustainability.
- Practical judgements and decisions must remain, however, with engineering technocrats and a significant number of counterpart disciplines, well-educated for dealing with 21st century problems.

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Terima Kasih

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