Human Environment Analysis Reasoning Tool (HEART)
Integrating the Human Dimension into Operational Planning and Analysis

Phil Jones, Tim Bacon, Sofi Blazeski, Abigail Davison-Jenkins, Laurie Fenstermacher, Gemma Warren, Nina Hellum , Mikael Lundin, Albert "Bull" Mitchum, Eric Ouellet, Thomas Peters, Luminita Stemate, Anders Tavemark, Peter Tikuisis, Tony van Vliet

NATO Research Task Group

System Analysis and Studies (SAS) 074

June 2011

Overview

1. Motivation and purpose
2. Approach
3. Description of tool (including summary examples of Use Cases)
4. An example of using the tool on a fictitious case of avoiding food crisis among minorities in a conflict zone
5. Current Status of Tool
6. Potential Future Developments
7. Recommendations

HEART: Motivation and purpose

Motivation for this work:

> The observation that although the human is central to operations, most operational planning currently does not use social science to its full potential.

Purpose of the tool:

> To facilitate understanding of the human environment in an operational context, and assist the development of appropriate courses of action that take into account the human aspect.
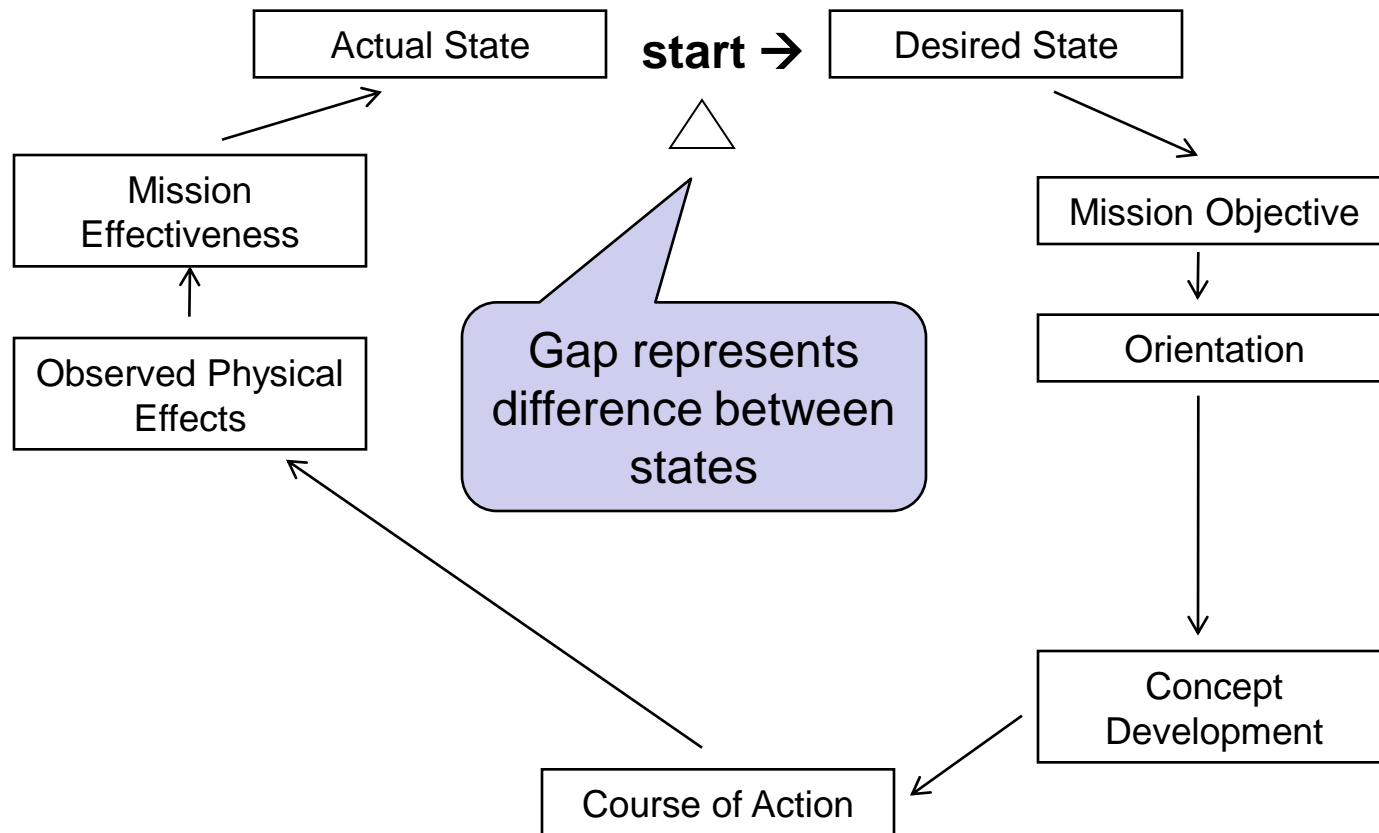
Potential users of the tool:

> Operational planners and analysts
> Scenario developers
> Trainers (for the two categories above)

A Simplified Representation of the Planning and Execution Cycle (no explicit integration of human aspects)

Actual State

start →

Desired State

Mission Effectiveness

Mission Objective

Observed Physical Effects

Orientation

Gap represents difference between states

Concept Development

Course of Action

Explicit Integration of Human Aspects into the Simplified Representation of the Planning and Execution Cycle
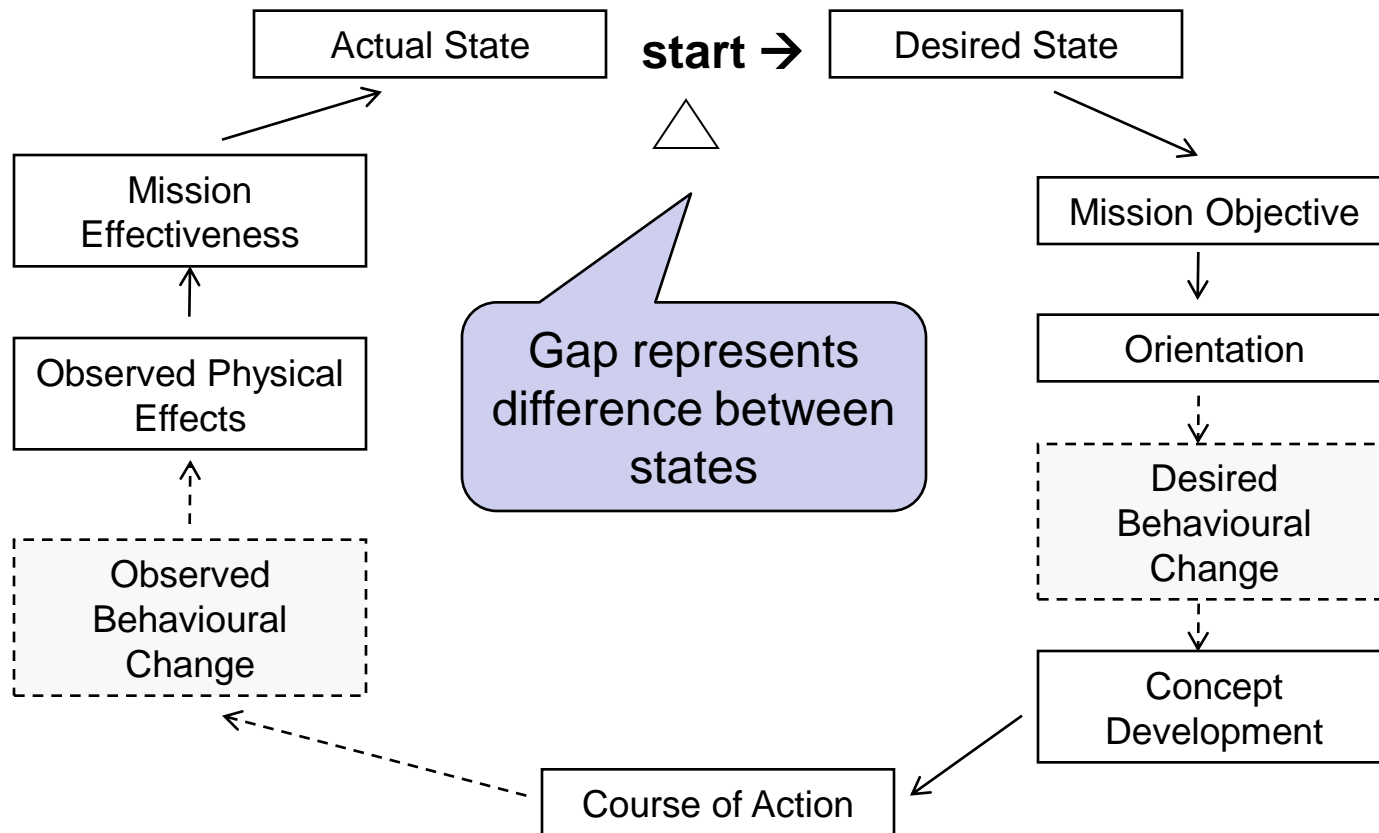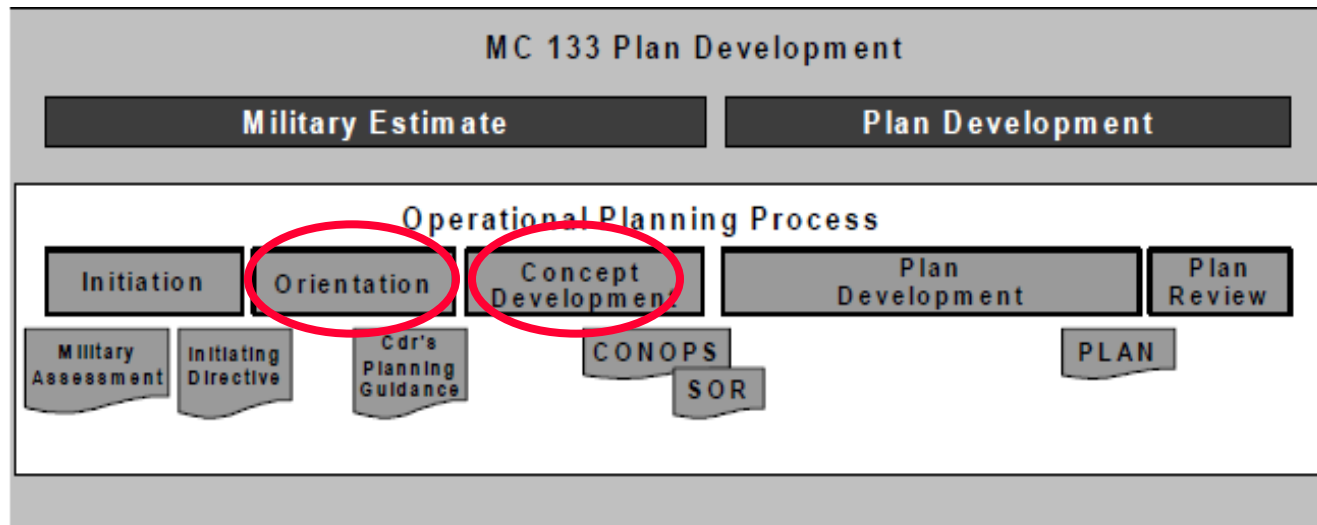
Approach

1) Architecture

Free to download at
www.cmap.ihmc.us

CmapTools
knowledge modeling kit

The IHMC CmapTools software empowers users to construct, navigate, share, and criticize knowledge models represented as Concept Maps

Approach

2) Aligned with *Orientation* and *Concept Development* phases of NATO's Operational Planning Process

But can be used with national planning processes or as a general knowledge resource!

Simplified View

Understand the human and social environment

Integrating this understanding into the development of courses of action

Orientation
What needs to be accomplished?

Concept Development
How best to do it?

Supporting guidance

and resources

HEART Home Page

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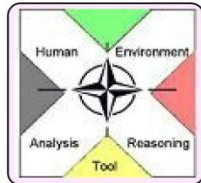
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Read me first !

contains →

Advice on alternatve modes of use

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Reports, presentations, & related material

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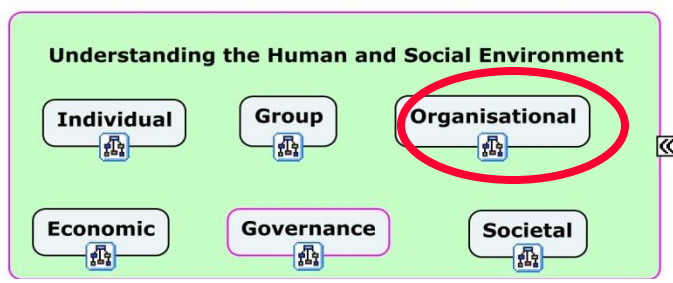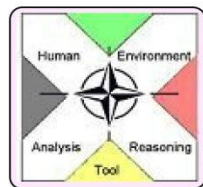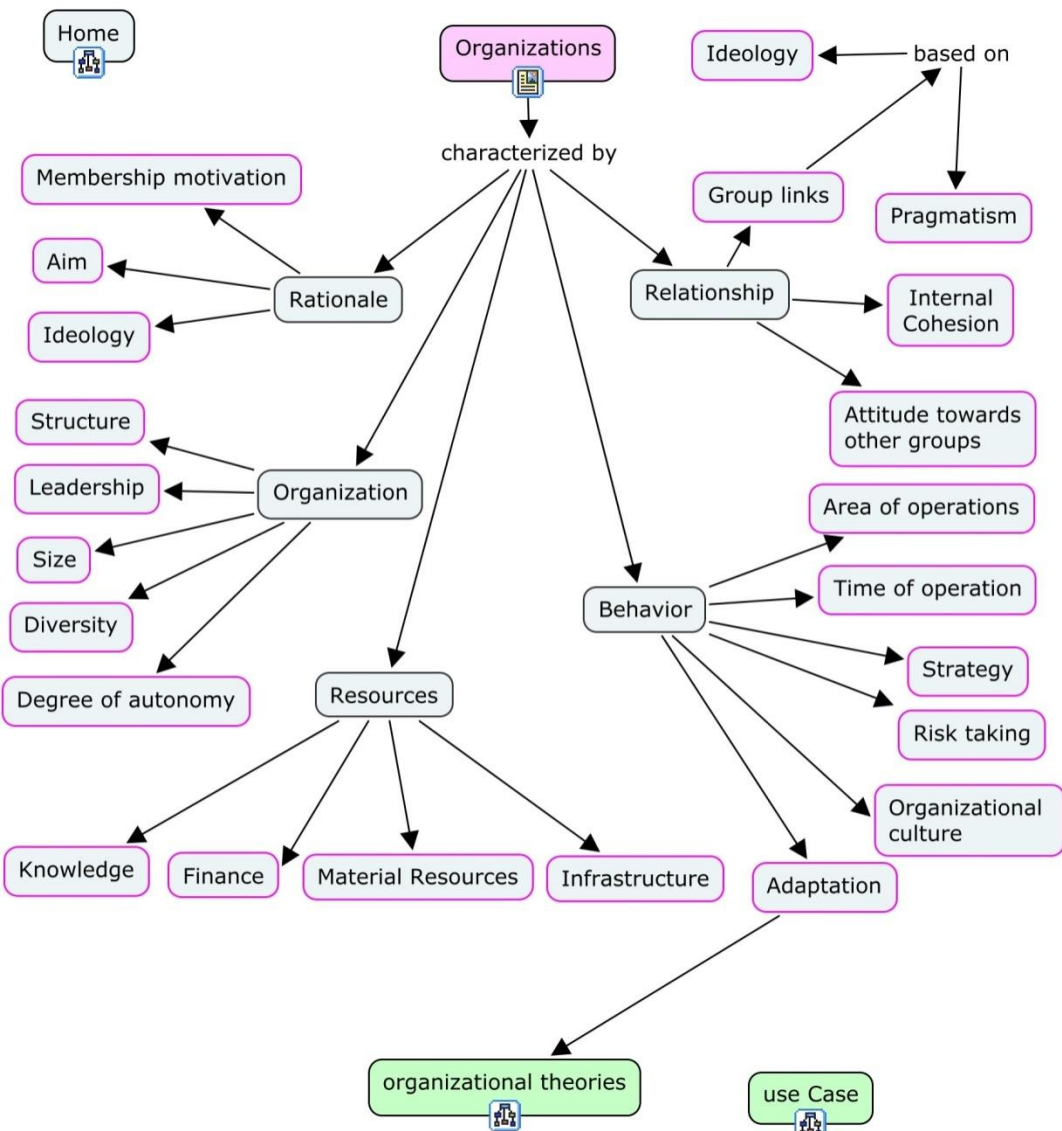
Given an operational problem that needs to be addressed

this guidance supports

Military Planning Processes ← → **Understanding, changing and analysing the human and social environment**

Human | Environment
Analysis | Reasoning
Tool

Understanding the Human and Social Environment

Individual   **Group**   **Organisational**

Economic   **Governance**   **Societal**

"Orientation"

Organisational Orientation

Home

Organizations

characterized by

Ideology → based on

Group links

Pragmatism

Membership motivation

Aim

Rationale

Ideology

Relationship → Internal Cohesion

Attitude towards other groups

Structure

Leadership

Organization

Size

Diversity

Behavior

Area of operations

Time of operation

Degree of autonomy

Resources

Strategy

Risk taking

Knowledge   Finance   Material Resources   Infrastructure

Organizational culture

Adaptation

organizational theories

use Case

Statement of Purpose:
To aide initial exploration of a organization of interest an generate an overview of key characteristics.
The CMap will help develop a framework within which an organisation can be considered. To this end, the guiding questions are there to guide the exploration rather than produce definitive answers.

Guiding questions:

Is it an organization? Is it a group of groups with a common aim?

What is the aim and ideology of the organization?
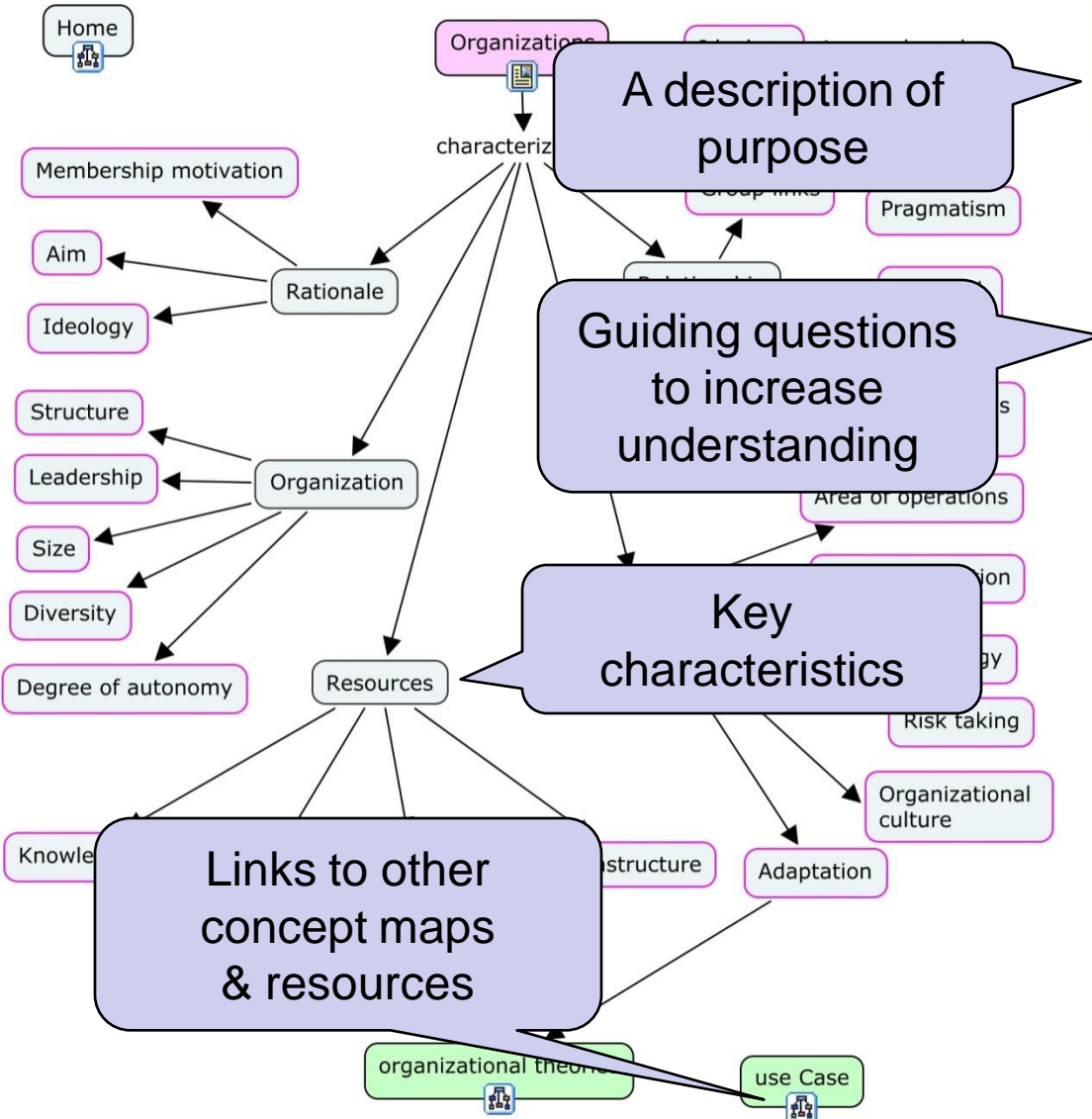Why are people motivated to join the organisation?

What is the structure of the organization?
What are the physical properties of the organization?
Is the intent of the leadership followed by the members of the organisation?
How would you characterise the leadership of the organisation?

How does the organization generate income?
What level of resources does the organization have access to?
What are the specific skills, knowledge and experience that the organisation has access to?

Where and when does the organisation operate?
How does the organisation try to achieve its aim?
What risks is the organisation willing to take?
What is the ethos and/or ideology that the organisation tries to instil with its members?
How does the organisation adapt to its changing evironment?

To what other organisations is the organisation linked?
Are these links hostile or friendly or both?
How influential is the organisation in its linkages?
Are these links predominantely ideological or pragmatic?
How tightly are the different parts of the organisation linked?

Organisational Orientation

Home

Organizations

characteriz...

Membership motivation

Aim

Ideology

Rationale

Structure

Leadership

Organization

Size

Diversity

Degree of autonomy

Resources

Knowle...

Group links

Pragmatism

Relationship...

Area of operations

...tion

...gy

Risk taking

Organizational culture

...structure

Adaptation

organizational theorie...

use Case

A description of purpose

Guiding questions to increase understanding

Key characteristics

Links to other concept maps & resources

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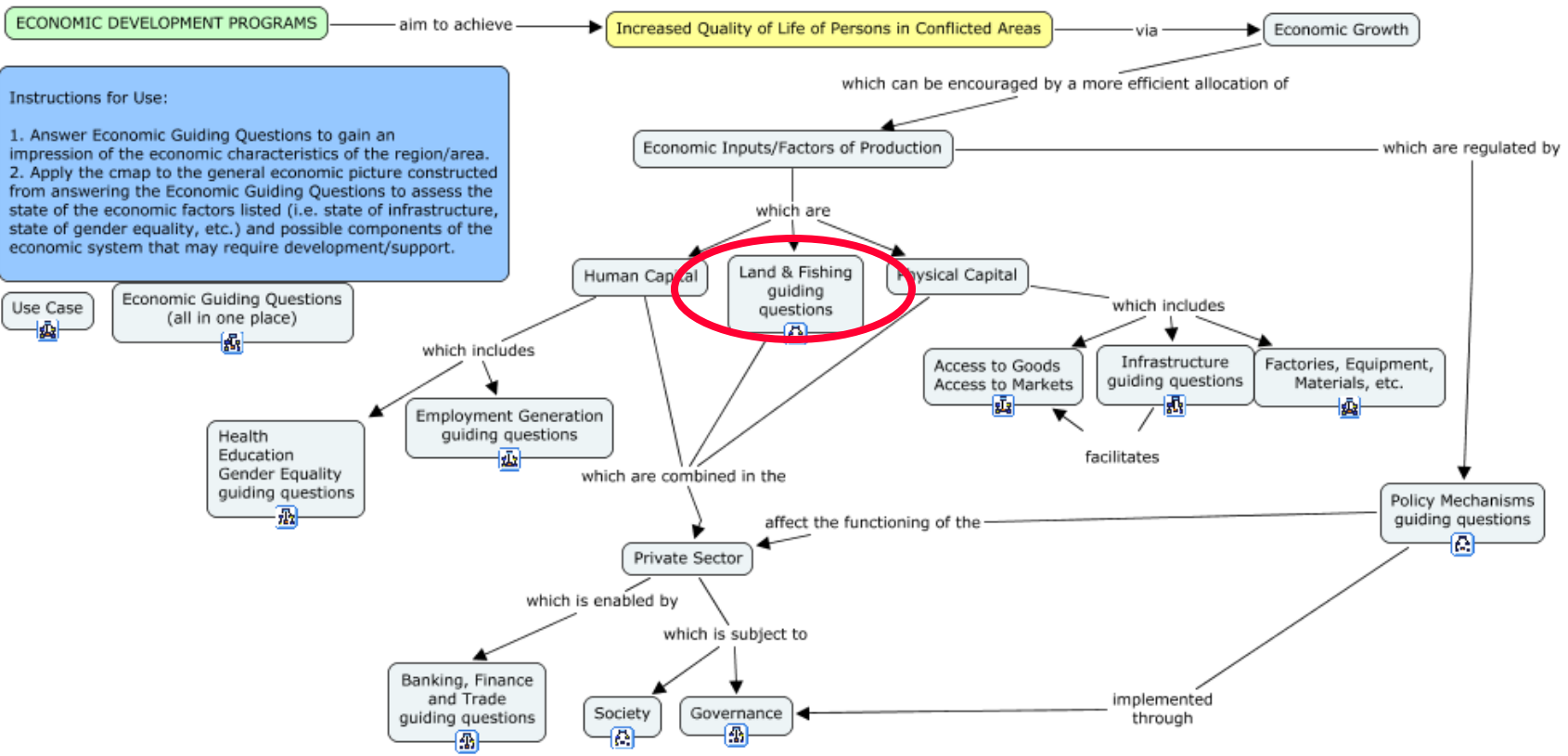
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An example: The Case of Avoiding Food Crisis in a Conflict Zone

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This Cmap provides an overview of the general factors that influence economic growth in a developing country. In addition, there are inumerable political, social, cultural and operational factors, outside of the economic, that are essential when determining what programs should or can be implemented in a given conflicted/post-conflict region.

Home

References

ECONOMIC DEVELOPMENT PROGRAMS —— aim to achieve —→ Increased Quality of Life of Persons in Conflicted Areas —— via —→ Economic Growth

Instructions for Use:

1. Answer Economic Guiding Questions to gain an impression of the economic characteristics of the region/area.
2. Apply the cmap to the general economic picture constructed from answering the Economic Guiding Questions to assess the state of the economic factors listed (i.e. state of infrastructure, state of gender equality, etc.) and possible components of the economic system that may require development/support.

which can be encouraged by a more efficient allocation of

Economic Inputs/Factors of Production —— which are regulated by

which are

Use Case

Economic Guiding Questions (all in one place)

Human Capital

Land & Fishing guiding questions

which includes

Employment Generation guiding questions

Health Education Gender Equality guiding questions

which are combined in the

affect the functioning

Private Sector

which is enabled by

which is subject to

Banking, Finance and Trade guiding questions

Society

Governance

The country, given its desert climate, has limited arable land, fragmented into very small units that have limited efficiency. Hence, the country can only meet about 25% of its food demand. Fishing options are also limited. The net result is that the country imports most of its food.
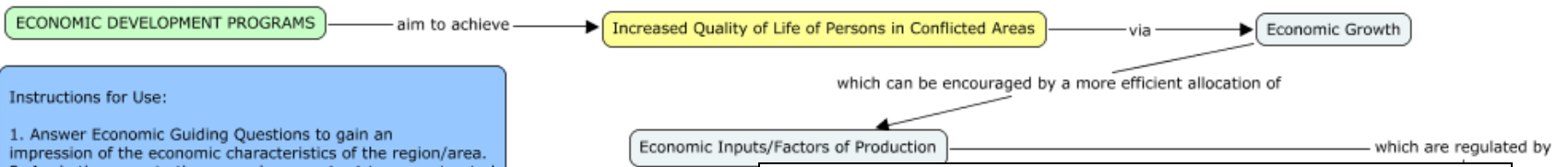
Food imports are mostly financed through income generated directly and indirectly by the oil industry (which used to be almost 95 % of the country's export income). Since the conflict started, the oil industry is only functioning at 1/3 of its capacity, in part due to the violence and in part due to the foreign expertise and labor fleeing the country. The deteriorating economic situation of the country may cause food shortages, and may affect more adversely minority groups.

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Education
Gender Equality
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Employment Generation
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Private Sector

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which is subj

Banking, Finance and Trade guiding questions

Society   Governa

The country has 2 key minority groups, namely the Blue (up to 10% of pop), and the Red foreigner (up to 20% of pop). In both cases, the regime, which is mostly Martian, has shown various forms of discriminatory attitudes towards these minorities. However, the Blue population has a diverse attitude towards the regime.
Among the key Blue tribes, the Azur have sided with regime while the Navy Blue tribe has sided with the opposition. The Azur are mostly employed in trade and transport industry and their loyalty with the regime has been long standing, while the Navy Blue are mostly engaged in farming in rural areas. The foreigners are usually found in urban areas in low paying employment.

Achieving Behavioural Change

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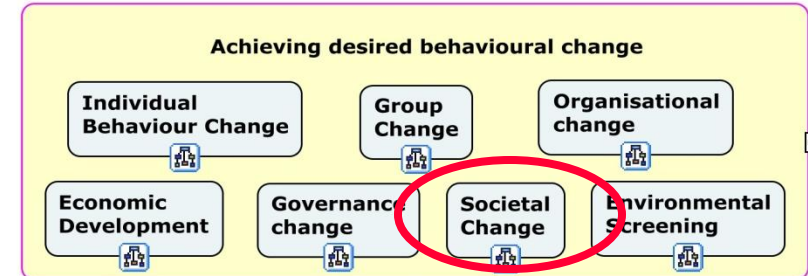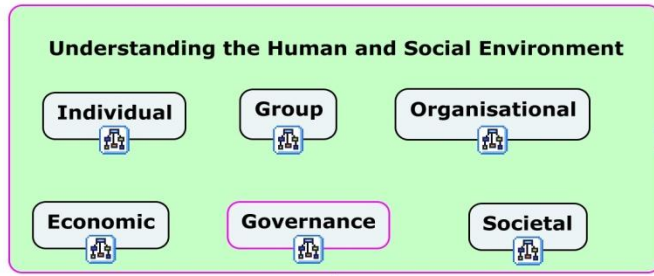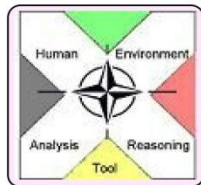
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Military Planning Processes

Understanding, changing and analysing the human and social environment

Understanding the Human and Social Environment

| Individual | Group | Organisational |
| Economic | Governance | Societal |

Achieving desired behavioural change

| Individual Behaviour Change | Group Change | Organisational change |
| Economic Development | Governance change | Societal Change | Environmental Screening |

"Concept Development"

Societal Change

Purpose: this is intended to stimulate thought on potential intervention strategies and courses of action, but shouldn't constrain thinking.

What social dynamics are going against the achievement of the desired end state?

start with

Assessing social and cultural existing tensions by using findings from Societal CMap

evaluate

the main source of societal resistance to the desired end state

which can be one or more of the following

Social inequity is favoring groups opposed to desired end state

Social power, through either tradition or formalized structures, favors groups opposed to desired end state

Historical legacy and/or ethnic divisions tensions hinder the achievement of the desired end state

Religious and / or ideological tensions hinder the achievement of the desired end state

consider

consider

consider

consider

developing programs that empower groups supportive of the desired end state

developing programs that provides incentives for those who hold social power to become supportive of the desired end state

developing programs designed to build trust and jointly responsibilize all involved parties

developing programs that empower moderate leaders and institutions

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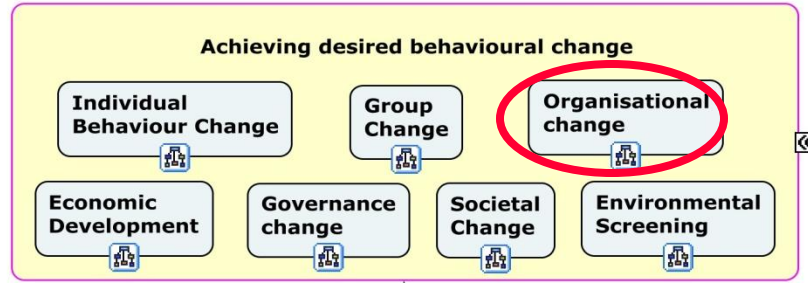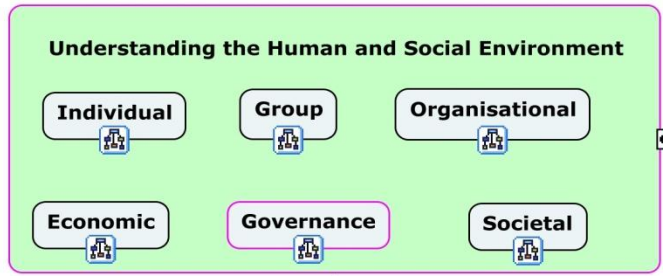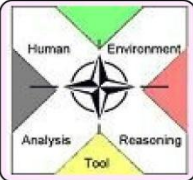
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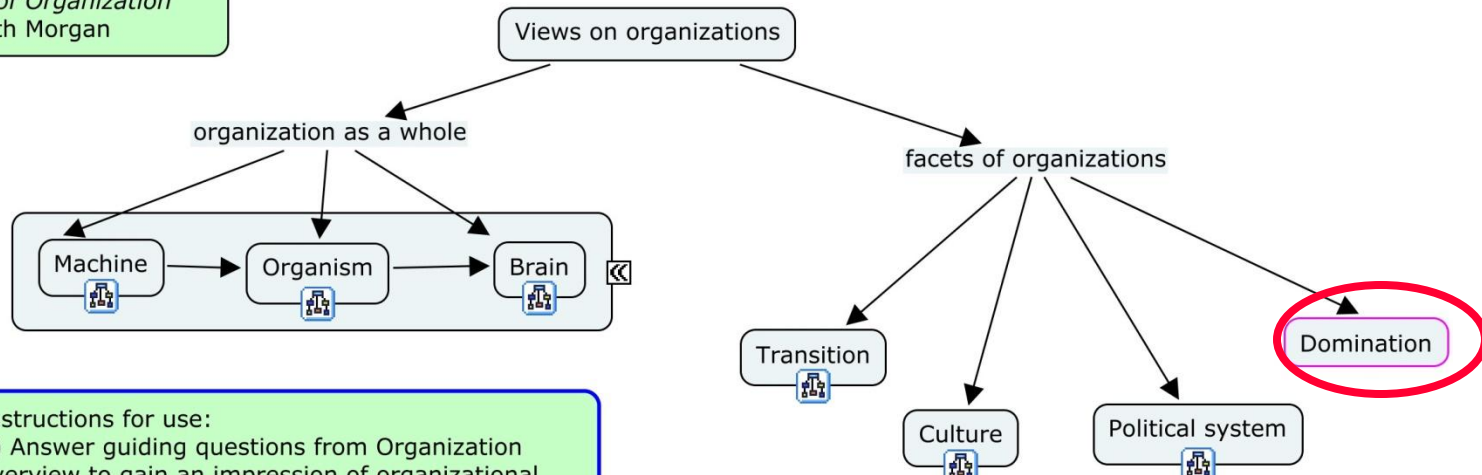| Individual Behaviour Change | Group Change | Organisational change |
| Economic Development | Governance change | Societal Change | Environmental Screening |

"Concept Development"

An example: The Case of Avoiding Food Crisis in a Conflict Zone

Some metaphors will be more fitting than others depending on the characteristics of the organization identified in the orientation activity. In turn this highlights likely organizational strengths and weaknesses to help develop appropriate courses of action.

Uses the ideas drawn from *Images of Organization* by Gareth Morgan

Views on organizations

organization as a whole

Machine → Organism → Brain

facets of organizations

Transition

Culture

Political system

Domination

Instructions for use:
1) Answer guiding questions from Organization overview to gain an impression of organizational characteristics
2) Apply each of the organizational metaphors for whole organizations (machine, organism, brain) and consider which are relevant to all or parts of the organization
3) Also consider which of the facets of the organization may also be relevant
4) Based on relevant metaphors identified, develop CONOPS for organizational change.

For foreigners and non-Azur Blue in government held areas, the international community could use the regime's seized funds in foreign banks to purchase food and deliver it in coordination with the naval interdiction policy (i.e. ensure that only humanitarian is coming through). However, a fair distribution of food in these areas will be difficult to implement given that the international community has limited leverage.

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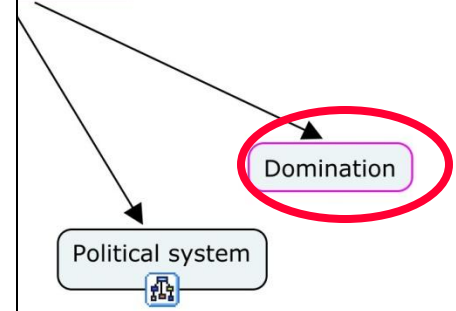
Uses the ideas drawn from
Ima
by C

The regime has been constructed over the years as a dynamic system where various factions are continually played against each other to the benefit of the leader and his close circle. The regime remains determined to stay in power in spite of the substantial opposition supported by the international community. As well, religion does not play a crucial role in the political life of the country and cannot be used for creating an effective mean of influence. Hence, intra-regime disruption does not appear to be an effective path for action at this time.

An area of weakness for the regime is its will to ensure some sort of survival, even if it is through exile. Survival in turn requires that it keeps a degree of international legitimacy, especially if exile becomes the only option left.

A possible course of action is to "trade" some international legitimacy (for future use by the regime) for a fair distribution of food. Given the leader's long involvement with the Venusian Union (VU), an VU led-mission in government held areas could ensure that minorities would receive a fair share of the food distribution.

anizations

Domination

Political system

ase

Use cases

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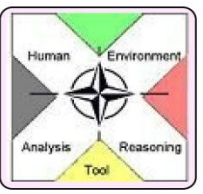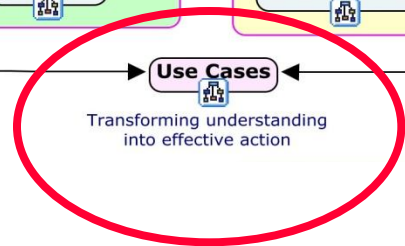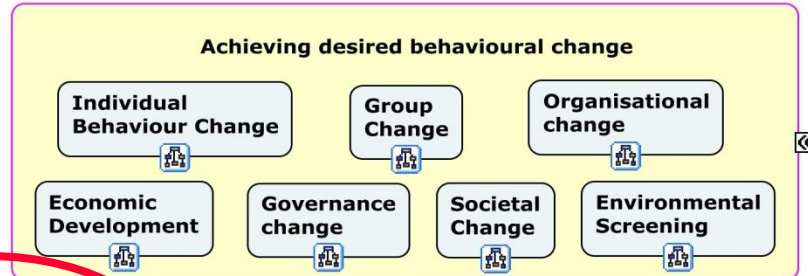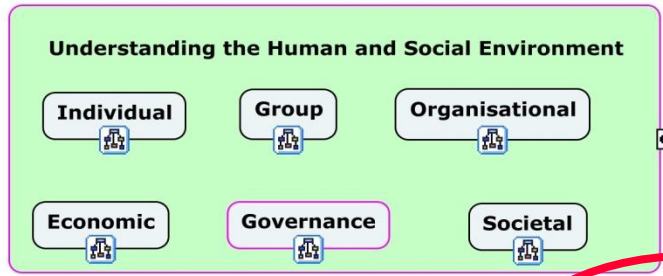
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Human Environment

Analysis Reasoning

Tool

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Group

Organisational

Economic

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Individual Behaviour Change

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Environmental Screening

Use Cases

Transforming understanding into effective action

e.g., Economic Development Use Case

Economic Development Use Case (cont'd)

Human & Social Analysis Resources

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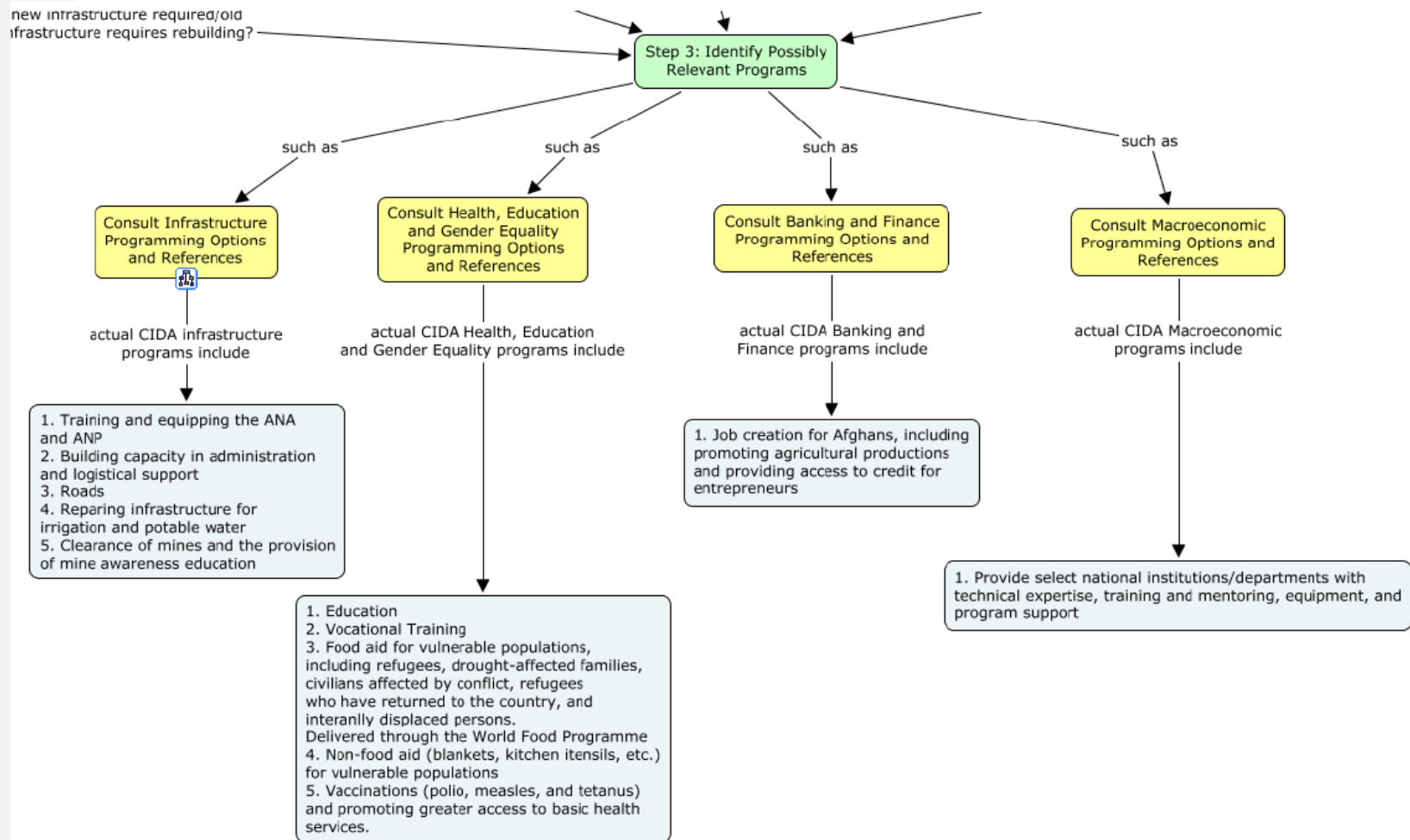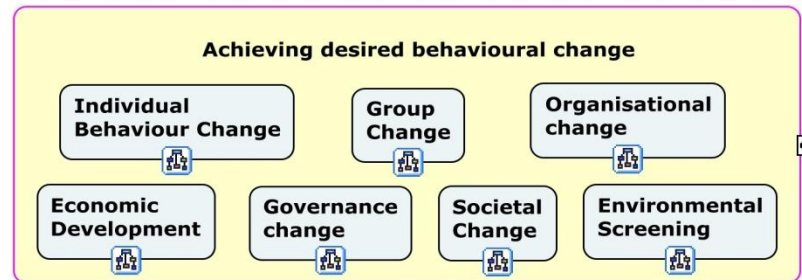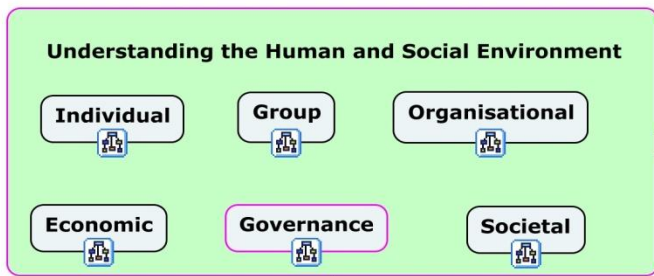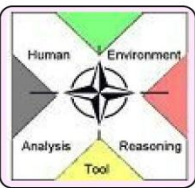**Understanding, changing and analysing the human and social environment**

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Transforming understanding into effective action

Human and Social Analysis Resources

Monitoring the human and social environment and evaluating interventions

Qualitative Research Methods

Problem structuring and decision support methods

Computational analysis methods

Statistical Methods

Selection and use of appropriate theories, methods and models

Human Environment Analysis Reasoning Tool

An Example of Drill-Down Capacity in HEART

This CMap suggests ways of monitoring the human and social environment and evaluating the impact of specific interventions

Monitoring the human and social environment and evaluating interventions

Home

is achieved using a combination of

Proactive engagement

Language skills

Cross-cultural competence

Data collection and analysis methods

may require

include

First level of drill-down from the "Monitoring of human and social environment and evaluation of intervention strategies" sub-module of the "Resources" module.

Effective use of Interpreters

Direct methods

Indi

Face-to face encounters

Use Matt

Surveys and Polls

Ope a

such as

Interviews

Clos A

Routine Patrols

Community group Interviews

Mo

Focus groups

Key leader engagement

Soc Mo

Direct Observation

An Example of Drill-Down Capacity in HEART (continued)

Effective use of Interpreters
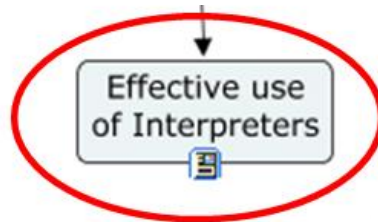
Second level of drill-down...

USE OF INTERPRETERS: BEST PRACTICE

KNOWLEDGE OF LANGUAGE AND INTERESTS. Ideally interpreters should not only have the required linguistic abilities, but also be trained in the research field so that they might best understand the line of thought or objectives of the researcher.

CONTINUED TRAINING. Training is not something to be done at the outset and then dispensed with: it should be understood as lasting throughout the research. Discussions and debriefings after interview sessions should be a regular practice, where difficulties of translation can be discussed.

BACK TRANSLATING. For quality assessment. This involves having one interpreter translate a text from the investigator's language into the local language, and thereafter have another interpreter translate it back again. The two versions are then compared and the discrepancies discussed with the interpreters.

...

References & Data Resources

Human Environment Analysis Reasoning Tool Home Page
This Concept Map provides the 'home page' to take users through a generic process to:

* Understand the human and social environment in a specific operational context.
* Develop and evaluate desired changes and associated courses of action.
* Make appropriate use of associated theories, methods and models.

The process may be incorporated within military planning and analysis processes, or provide a knowledge resource for operational analysts and others within a military HQ.

It was developed by NATO SAS RTG-074.

has

Details of the SAS-074 Group and CMapTools
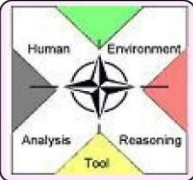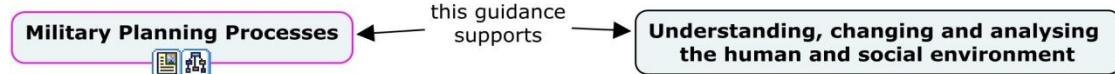
An Overview and User guide Read me first !

Advice on alternatve modes of use

contains

Important information about the assessed fitness for purpose of the tool.

A pink border means that more info can be obtained by moving the mouse over the concept. This feature is currently not available on the web page view of the Concept Maps.

Clicking on an icon below a concept provides links to other resources (other Cmaps, reports, www links etc.).

Given an operational problem that needs to be addressed

this guidance supports

Military Planning Processes

Understanding, changing and analysing the human and social environment

Human | Environment
Analysis | Reasoning
Tool

Understanding the Human and Social Environment

| Individual | Group | Organisational |

| Economic | Governance | Societal |

Achieving desired behavioural change

| Individual Behaviour Change | Group Change | Organisational change |

| Economic Development | Governance change | Societal Change | Environmental Screening |

Use Cases

Transforming understanding into effective action

Human and Social Analysis Resources

| Monitoring the human and social environment and evaluating interventions | Qualitative Research Methods | Problem structuring and decision support methods |

| Computational analysis methods | Statistical Methods | Selection and use of appropriate theories, methods and models |

Reference and data resources

| Reference sources | Socio-cultural data sources |

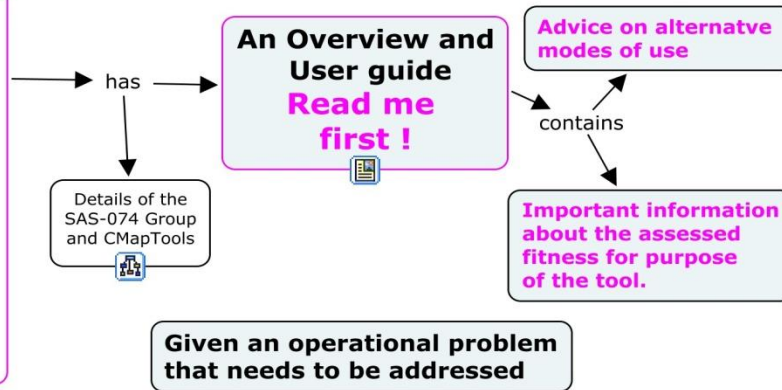| Selection and use of SMEs | Fitness for purpose test: UNTAES mission in Croatia |

e.g., Reference Sources

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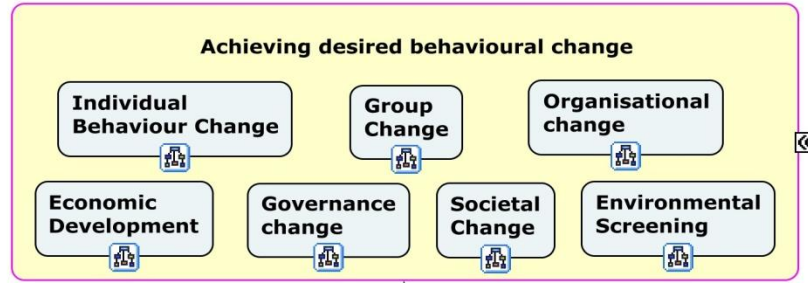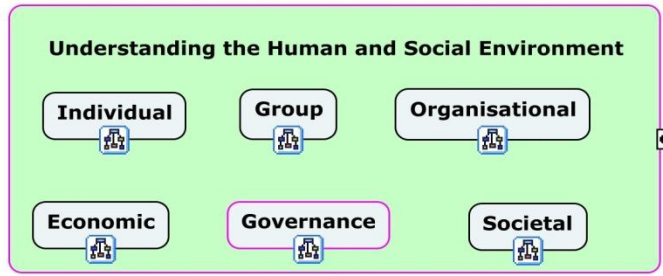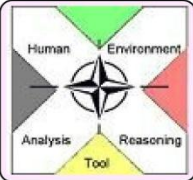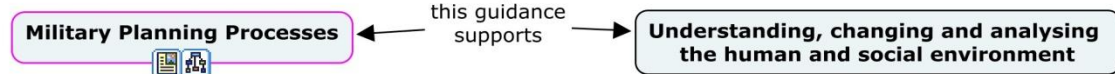
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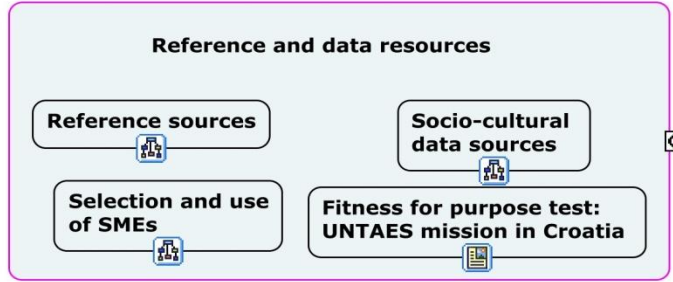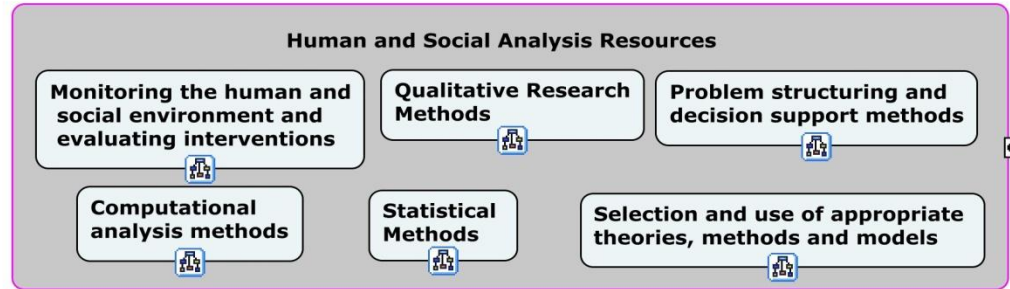
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How to Access HEART

As Concept Maps
• The tool can be viewed using the CMaptools program which is available for free from www.cmap.ihmc.us. General help and advice on using CMaptools are also available from this site.
• Once CMaptools is opened, the SAS 074 CMaps are held in 'Shared Cmaps in Places', in sub-folder IHMC Public Cmaps (3) > Users (create your own folder) > SAS 074.
• You will then be asked to supply a user name and password. Read-only access is available using user name 'visitor' and password 'gateway'.
• The 'home page', illustrated in Figure 3, can be accessed by clicking on *'00 SAS-074 Process View Shortcut'*.
• Users are strongly encouraged to read the user guide before proceeding further.

As HTML Pages
• The tool may also be viewed as Internet-based html pages using the url: **SAS 074**
• You will be requested for a user name and password: 'visitor' and 'gateway'.
• The main disadvantage of viewing the pages in this manner is that the 'mouse over' feature used to gain more information about individual concepts does not work. The SAS 074 Concept Maps make extensive use of this feature: concepts that have extra 'mouse over' information are identified with a pink border.

Status of the tool

- A concept demonstrator
- The Netherlands have already taken the idea further with their ADAPT tool
  - In a simulated Brigade HQ planning experiment it was beneficial in improving the planning process
- Evaluation was undertaken with several sets of potential users during development
- Was awarded the Ken Bowen Award (DSTL) for innovation

Potential Future Developments

- Improve usability of tool (make it more intuitive and user-friendly through development of new user interfaces)
- Further in-depth testing and evaluation of tool
- Enhance visual representation by using additional software packages (e.g. a wiki back-end and topic-centered mind maps)
- Increase portability of the tool (e.g. as an executable on an external disk drive or USB stick)
- Produce a video (or online tutorial) on how to use the tool
- Tune the tool to national and NATO requirements

Recommendations of SAS-074 RTG

- Socialization of HEART by means of a NATO Lecture Series
  - NATO Defense College in Rome
  - US National Defense University
  - Other National Defense Colleges
- HEART should be hosted on, or advertized from, the NATO Research and Technology (RTO) and Allied Command Transformation (ACT) websites
- Further technical enhancements to the tool would be better achieved through a full-time effort that could be undertaken by NATO ACT, potentially supported by NC3A. An RTG could be created to provide direction and oversight of such developments

Contact Information

Point of Contact	Country	Email
Philip Jones (SAS RTG-074 Lead)	UK and other nations	prjones@dstl.gov.uk
Peter Tikuisis	Canada	Peter.Tikuisis@drdc-rddc.gc.ca
Tony van Vliet	Netherlands	tony.vanvliet@tno.nl
Nina Hellum	Norway	nina.hellum@ffi.no
Anders Tavemark	Sweden	anders.tavemark@foi.se
Laurie Fenstermacher	USA	Laurie.Fenstermacher@wpafb.af.mil

The SAS RTG-074 group at the NATO Defense College Rome