

# A Tool for Measuring Sustainable Capacity Development with Agent-Based Spatial Asset Mapping

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1

## Research Contents

### ■ Backgrounds

### ■ I. Related Works and Challenges

#### 1. International CD Model & Assessment Frameworks (UNDP, WB etc)

### ■ II. New Analysis of CD and Creation of SCD

1. Agent-Based Model for CD & Asset-Based Model for SD
2. New creation of Sustainable Capacity Development (SCD)

### ■ III. Mechanism between CD and SD

1. Capital-based SD approach to CD
2. Agent-Based Spatial Asset Mapping

### ■ IV. Measuring SCD using Agent-Based Spatial Asset Mapping

### ■ V. Conclusion and Contributions

2

## Backgrounds

- Int'l CD's Concept, Models & Assessment Framework are enough mature to meet present needs of well-being & sustainability ?

- How CD could support SD and What does SCD means ?

1. Agent-Based Model for CD and Asset-Based Model for SD
2. Creation of Sustainable Capacity Development (SCD)

- Agent-Based Spatial Asset Mapping

1. Implementing concept of SCD
2. Assisting integrated surveying services & supporting CD Task force UN organizations

- Comparisons UN Model and Research Model

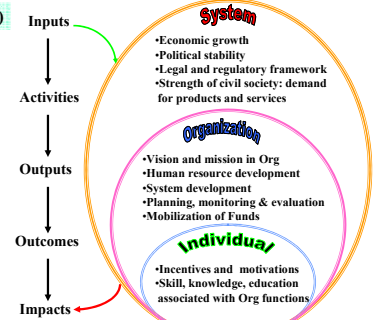
3

## I. International Definition & Model of Capacity Development (CD)

### Capacity Development (CD)

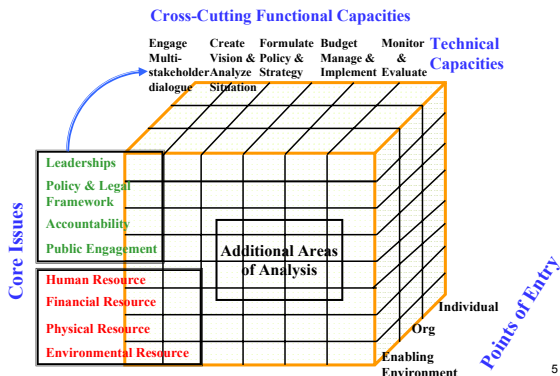
- CD is the process through which the abilities to do so are obtained, strengthened, adapted and maintained over time (UNDP, 2006)

- Capacity Assessment is an analysis of the state of current capacities against desired future capacities (UNDP, 2006)



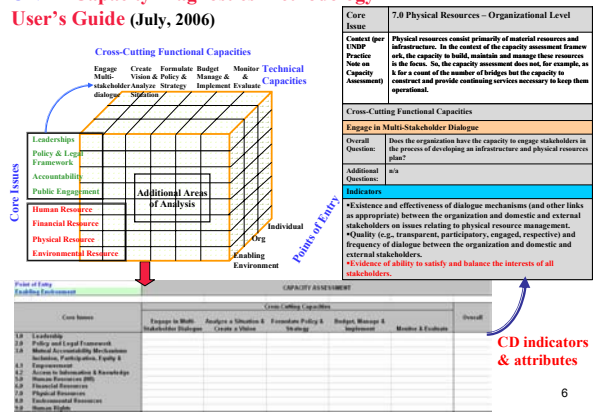
Logical Model for CD (UNDP, UNFPA, 2003) 4

## UNDP Capacity Assessment Framework (2006)



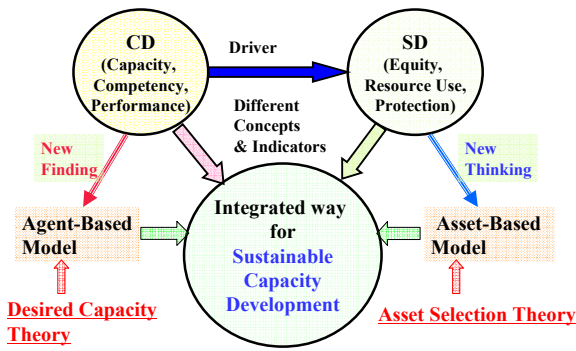
5

## UNDP Capacity Diagnostics Methodology User's Guide (July, 2006)



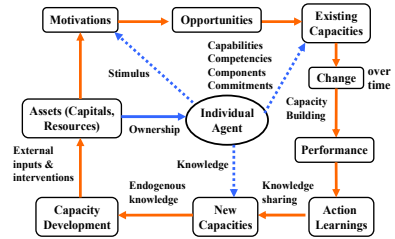
6

## II. New Analysis of CD and creation of SCD



7

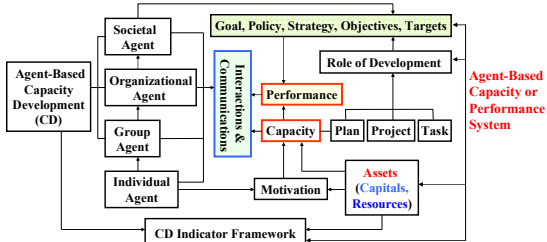
## CD Process with asset's (capitals & resources) ownerships



- CD considered as endogenous course of actions & long-term process of knowledge learning based on existing capacities and assets (capitals, resources)
- Agent is used to describe different natures of people, things, associations, organizations and societies that have goal-oriented properties
- Agent understands discourse of his capacity and how to cope with CD changes over time

8

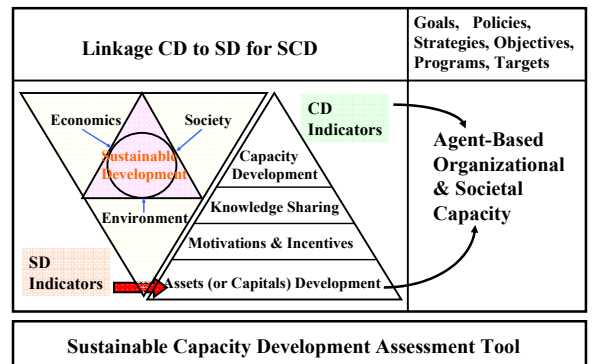
## Agent-Based Model for Capacity Development



- Agent capacity that links goals and behaviors (goal-oriented entity)
- Dynamic simulation of capacity's (e.g. knowledge) transfer among agents
- Effective representation of diverse types of capacities, motivations, attributes and properties of agents
- Full supports for existing CD models through agent's **Interaction and Communication Method**

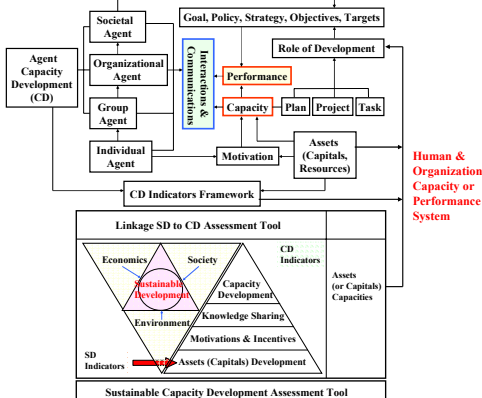
9

## How could SD distill into CD ?



10

## III. Mechanism between CD and SD



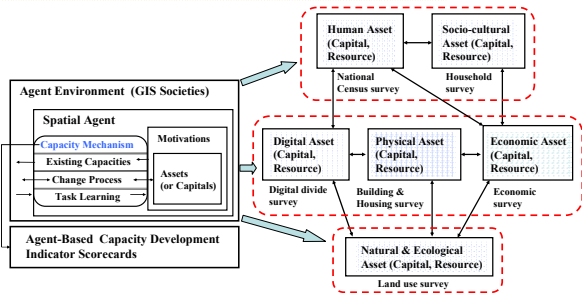
11

## Spatial Asset Mapping for Measuring SCD

- An asset becomes capital when it is invested. Capitals are considered to be stocks of assets.
- Asset Mapping is a process of making inventories of the capacities of individual, community, and society, and requires capacity inventory in an **Asset Map Database** as a tool for Sustainable Livelihood & Community Capacity Building
- Capacity = Asset (or Capital)+ Agent (Use, Business, Application, etc) based on **Asset (or Capital) Selection Theory** with **Dynamic Simulation of Asset's (or Capital) Flow**
- Spatial Asset Mapping is used to identify & measure capacity by analyzing **spatial location & distribution of assets** related to **sustainable community (or regional) development**

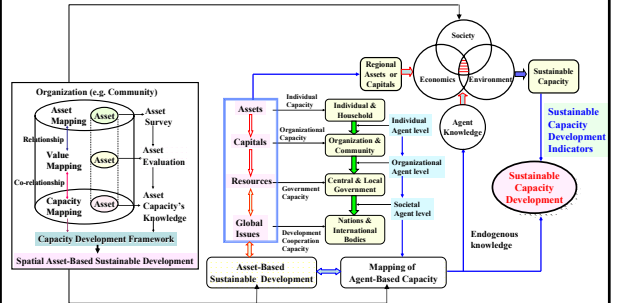
12

## Agent-Based spatial asset mapping for integrated surveying services



13

## IV. Measuring SCD using Agent-Based spatial asset mapping



SCD is defined as sustainable capacity for agent's ability to perform their functions, ensure better quality of life and, achieve CD through sustainable use of assets, capitals and resources

14

## Comparison between UN model and Research model

	UN Model	Research Model
Definitional Capacity Measures	Ability of Individual, Organization & Society	Asset (Capital)-Based with Selection Theory
CD Methodology	Logical Model	Agent-Based Model
CD Indicators	<b>SMART</b> (Specific, Measurable, Attainable, Relevant, Timebound)	<b>Asset's Capacity and Agent's Ability</b>
Capacity Assessment	Points of Entry, Core Issues Functional Capacity	<b>Asset, Value, Capacity (Mapping)</b>
Applicability	<b>Static &amp; Limited</b>	<b>Dynamic &amp; Practical</b>
Support for SD	<b>Unidentified</b>	<b>Full support</b>
Connection with GIS	<b>No Linkage</b>	<b>Spatial Agent</b>
Support for SCD	<b>No Linkage</b>	<b>4D Spatial Asset Mapping with ABM<sub>s</sub></b>

## Contributions and Future Works

- Agent-based model for CD & Asset-based model for SD
- Solution for combination between CD and SD
- New approach to measuring SCD using Agent-Based SAM
- Agent-Based Spatial Asset Mapping (SAM): **Sustainable Livelihood (WB, UNDP), Sustainable Community Development, Community Capacity Building (UNHABITAT, UNEP, etc) and Socio-Economic Polarization Reduction**
- --- ---
- **Asset Selection Theory & Desired Capacity Theory will be required for further implementation of SCD**
- **Asset Selection Theory for a new finding of Asset Economics in Geo-Space (???—!!!: Spatial Asset Economics)**
- **More supports for UN organizations (UNDP, WB, UNEP, UNHABITAT, etc) and national governments (Hong Kong, Sweden, Kostarica, German, USA, etc)**

16

## Web Site

- <http://www.capacity.undp.org>
- <http://www.unep-unctad.org/cbtf/>
- [http://www.fig.net/pub/fig2006/papers/ts74/ts74\\_01\\_liou\\_0516.pdf](http://www.fig.net/pub/fig2006/papers/ts74/ts74_01_liou_0516.pdf)
- [http://www.fig.net/pub/fig2006/ppt/ts74/ts74\\_01\\_liou\\_ppt\\_0516.pdf](http://www.fig.net/pub/fig2006/ppt/ts74/ts74_01_liou_ppt_0516.pdf)

Thank you for your participation and comments

17