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Capacity Building to Address Food Security under increasing Climate Change Effects

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Content

- Cambodia development context
- Agriculture and climate change issues
- Proposed actions and practices in agriculture to adapt to climate change
- Needs in education for deal with climate change in agriculture
- Lesson learnt





CHINA
BURMA
LAOS
THAILAND
VIETNAM
Phnom Penh
Philippine Sea
PHILIPPINES
MALAYSIA
INDONESIA
Indian Ocean
AUSTRALIA
GREAT SANDY DESERT

181,035 square km; 25 provinces

- 183 districts
- 1,621 communes
- 14,073 villages

Est. population 15.63 in 2016 million with annual growth of 1.44%

- 0-14 years <30%
- 15-25 years 20%
- 25-54 years 40%
- <55 years 5.57%.

Cambodia development context

- Cambodia has achieved 7% annual growth for the last 14 years (ADB 2011)
- Poverty has fallen from 47.8% in 2007 to 18.9% in 2012*
- Income per capita increased from $879.2 in 2011 to $1,094.6 in 2014 (WB 2015)
- Economic engine: Services (40.7%) agriculture (34.8%), industry (24.5%)
- 80% population lived in rural areas in 2009
- Poverty rate is higher in rural than urban areas, in particular Plateau / Mountains is the poorest region (with 52% poverty rate), Tonle Sap (42%), plains (32%), coastal (27%) and PP (4.6%) (MoP 2014)

*ADB 2014. Cambodia – country poverty analysis

Sources of Livelihood for Farming Community

- Agriculture contributes 37% to the GDP and employed about 67 percent of the workforce in 2012
  - **80% of the population live in the rural area of which 68 % of labor forces work in Agriculture.**
  - 3.7 million hectares of cultivated land,
    - 75% for rice, primary commodity and source of income for the majority of farmers
    - 25 % for other food and industrial crops (rubber)
  - **67% keep cattle, 46% raise pigs, 90% practice backyard poultry.**
  - **Other income: fishing, NTFP, etc.**

Natural Resources dependent

	Aver. Annual Compounded Growth Rates over 2003-2012			Contribution to Production Growth of Different Factors		
Crop	Land	Yield	Production	Land	Yield	Other
Rice	3.2%	4.5%	7.8%	41.0%	57.2%	1.8%
Wet Season	2.6%	4.4%	7.1%	36.9%	61.5%	1.6%
Dry Season	6.8%	3.6%	10.6%	64.0%	33.7%	2.3%
Maize	9.7%	3.0%	13.1%	74.5%	23.3%	2.3%
Cassava	33.1%	6.4%	41.7%	79.4%	15.5%	5.1%
Vegetables	4.6%	7.8%	12.8%	36.2%	61.0%	2.8%

Source: ACI 2014

ENVIRONMENTAL DETERIORATION AND CONSEQUENCES

- Expansion of economic activities and utilization of natural resources with limited consideration on the ecological or environmental consequences.
- Trend shows an accelerated increase in natural resource demand and related environmental consequences (i.e. agrochemical use, expanding cultivated land, burning of agriculture residues, etc.).
- Cambodia lost an average of 142,500 ha or 1.1% of forest annually ➔ from 61.15% in 2002 to 57.07% in 2010 (RGC, 2012).
- Flooded forests were 614,000 ha in 1960s and 362,000 ha in 1991 (RGC, 2012).
  - 39% and 38% of villages in Cambodia are experiencing flooding and drought respectively (NIS 2015)

Constraints for agriculture growth

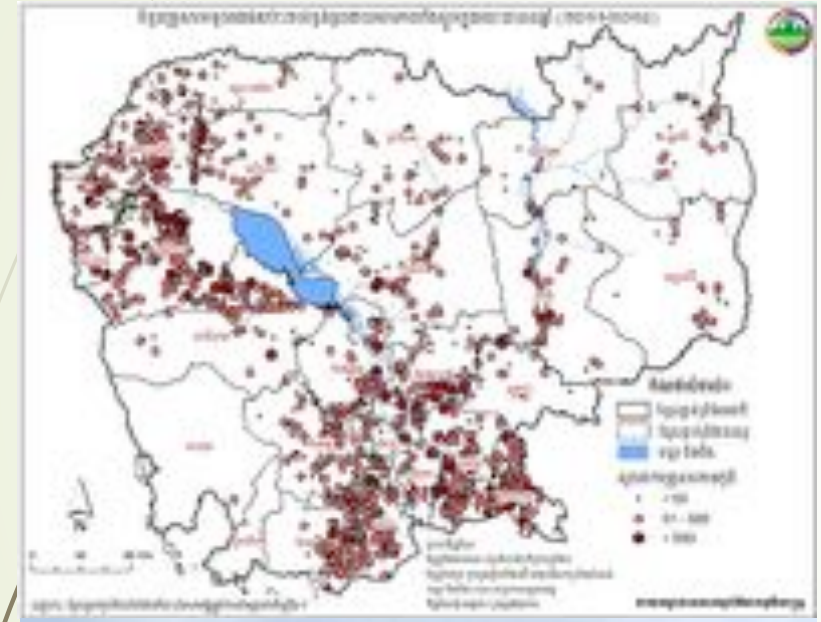
- Low education – on average with 4.33±0.16 grade.
- Poor investment in agriculture – 1% of farm families get access to agriculture extension services.
- Rain dependence of agriculture.
- Poor and uncertain market access.
- Climate change issues

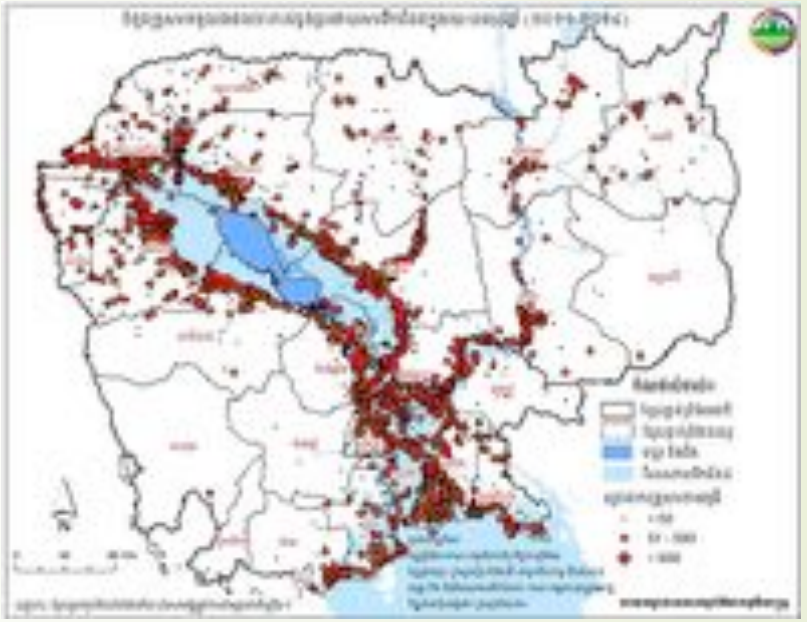
Climate Change Response Capacity
SWOT Analysis - Weaknesses

- Weak knowledge and science-based decision making;
- Lack of clear procedure for integration of climate change in the national development plans;
- Limited capacity of the national institutions responsible for climate change and limited participation of stakeholders;
- Out-dated information to address climate impacts;
- Limited human resources;
- Climate change planning is not a common practice;
- Limited knowledge, research and technology;
- Limited financial resources;
- Low adaptive capacity among citizens

Source: Cambodian Climate Change Strategy 2014-2023

Population affected by flood and drought 2011-2014





Dealing with climate change issues

- Climate Change Mitigation activities in Cambodia can be group into two themes,
  - 1) activities falling under the Clean Development Mechanism (CDM), and
  - 2) those connected with Reducing Emissions for Deforestation and Forest Degradation (REDD).
- Climate Change Adaptation is the accumulation of processes, autonomous and or planned, that result in adjustments to new conditions, stresses, and natural hazards that enhance people's resilience to climate change.

Proposed action for climate change adaptation

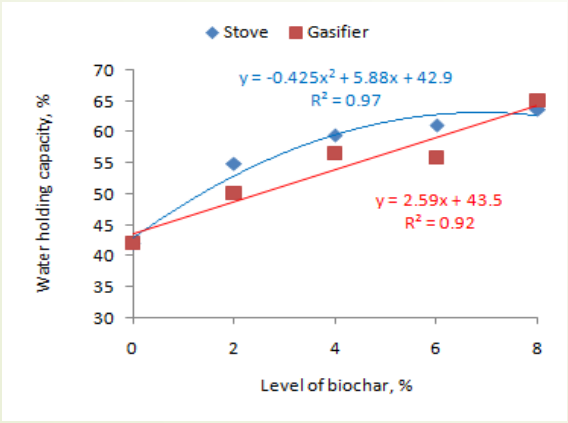
- Provide training to agricultural extension workers to cope with climate change issues
- Build farmers' adaptive capacity to cope with climate extremes and diversify farming activities
- Introduction of High-yielding, flood-resilient, heat and drought resistant crop varieties
- On-farm demonstration of climate-smart seed/crop varieties and farming techniques
- Better resource utilization including land and water management and farm residues
- Efficient crop management and agricultural practices
- Make weather and climate variability forecasting available to farmers
- High-carbon cropping or soil carbon enrichment and restoration

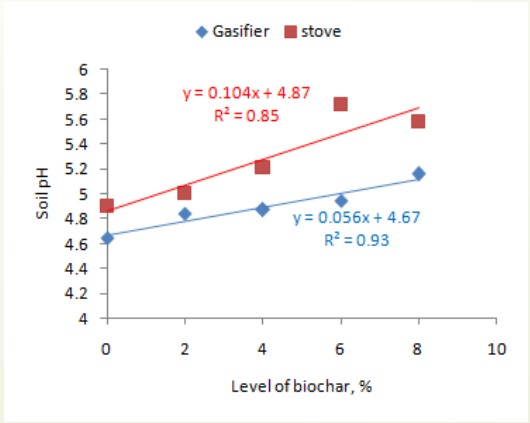
Changing agriculture practices to adapt climate change

- 55% cultivates one crop per year and 45% does 2 crops (mostly early monsoon rice with 3 months varieties) – adopting new rice cultivar that can stand longer flooding or a short term 3 months rice varieties – in progress
- Diversification of cropping systems from rice to vegetables and short term less water requirement (water and winter melons, pumpkin) – more common
- Diversification of farm components to invest more on those less risk to climate change – livestock moveable when flooding – in project stage

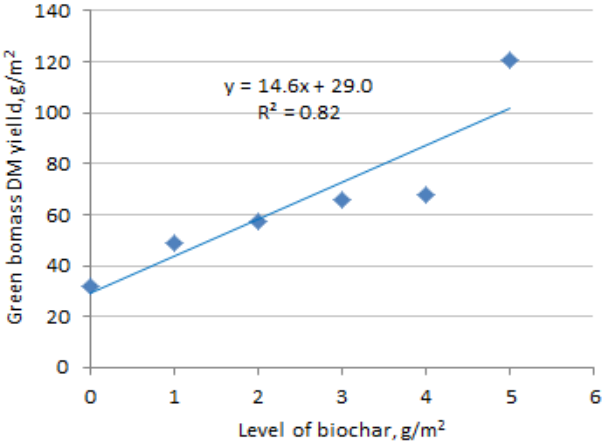
Changing agriculture practices to adapt climate change

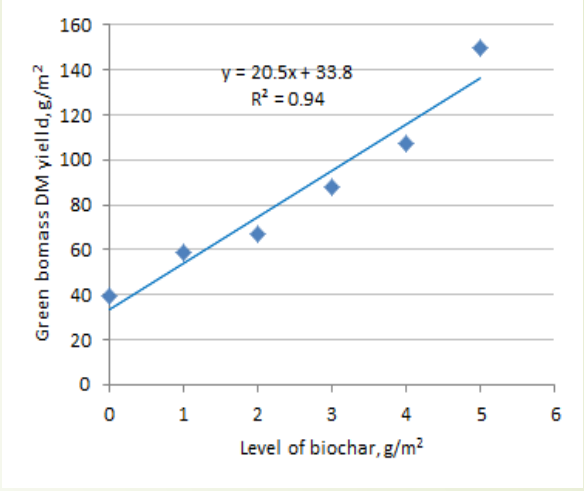
- Changing agriculture practices such mulching, cover cropping and zero tillage – experimental and demonstration stage
- Micro watershed management by digging family as well as communal ponds – project stage
- Adding new agronomic inputs mixing biochar with other nutrients – in progress



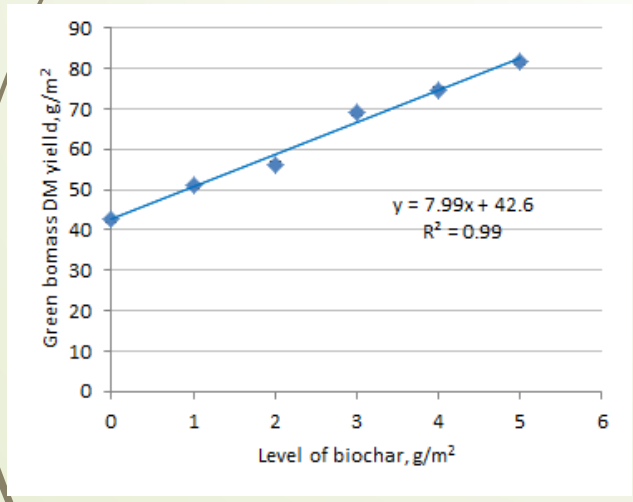



Celery cabbage


y = 14.6x + 29.0
R² = 0.82
Green bomass DM yield, g/m²
Level of biochar, g/m²

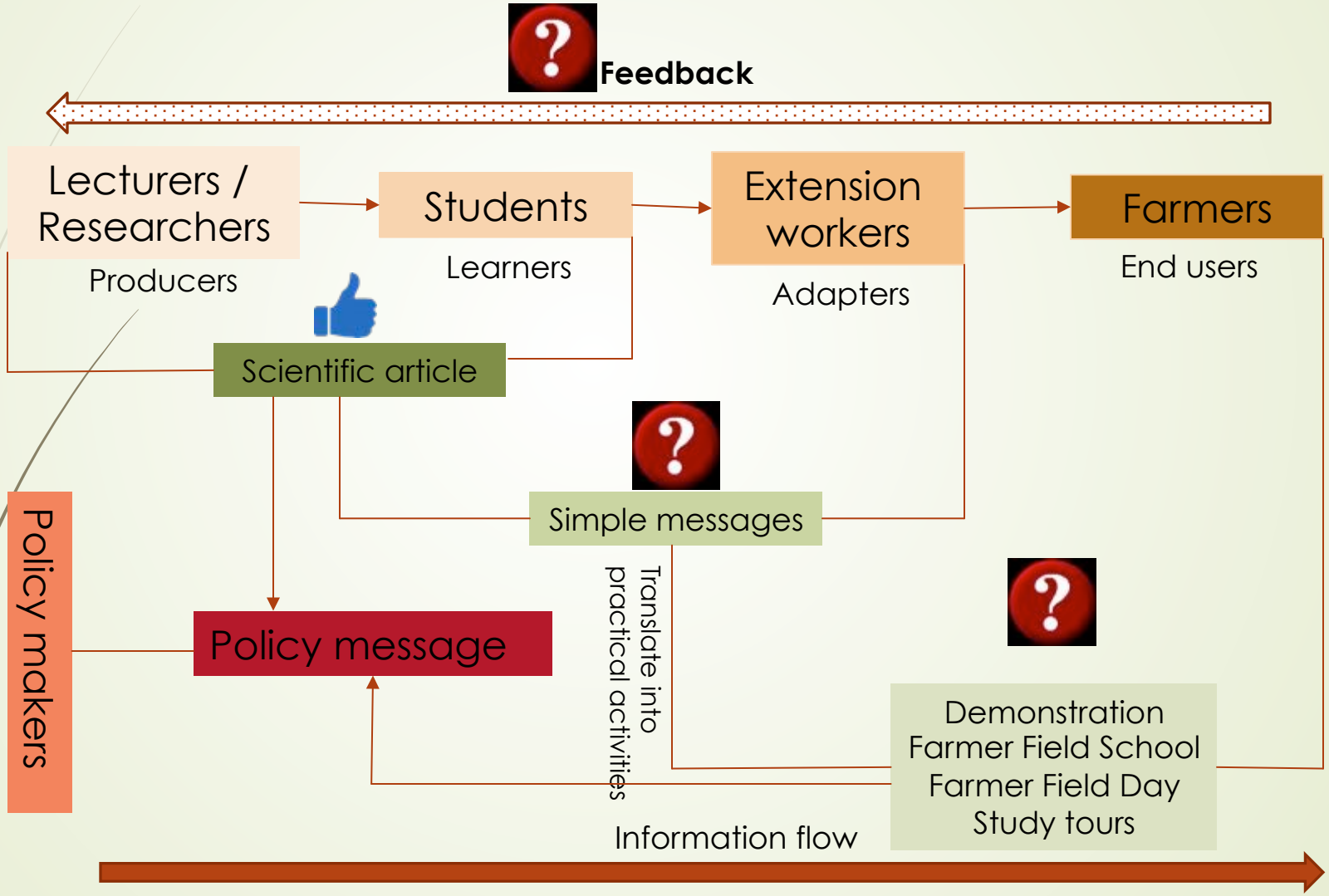

y = 20.5x + 33.8
R² = 0.94
Green bomass DM yield, g/m²
Level of biochar, g/m²


Green mustard


y = 7.99x + 42.6
R² = 0.99
Green bomass DM yield, g/m²
Level of biochar, g/m²


Chinese cabbage

Mechanism for information utilization



Understanding farmers issues and problems

Issues to be addressed in research must reflect farmers needs

Engage students in research activities

Training of Extension workers

Farmer Field School

Approach is "Learning by Doing"

Farmers doing it with a facilitator

Training venue of FFS

Discussing farmers' innovation

Monitoring the progress

Alternatives food and income for farmers

Farmers' Field Day

"Sharing results with other farmers"

Demo farmer explain other farmers

Measuring and comparing different practices

Participation of farmer's in measuring outputs

Lesson learnt and Recommendations

- Climate change becomes a risk factor for agriculture growth especially the food security of the smallholder farmers, building capacity helps addressing the issues of CC – train and facilitate to incorporate CC in their research agenda
- Farmer Field School and Field Day have been proven to be the effective tools for capacity building of farmers – train extension workers on methods, tools and techniques of FFS
- Farming communities quickly adapt and become more innovative to alternative technologies for the diversification of their farm activities – organize consultation farmers and concerned stakeholders for the development of research agenda
- Poor linkages and communication between researchers and extension workers affect the efficient utilization of research results – incorporating issues of linkages between research and extension into the research proposals

Thanks for attention

Needs	Actions