

Architecture, Organization and Policies of the Agricultural Mutual Relief Insurance Scheme in Japan

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I. Background and Objectives

- Indonesia now is implementing the agricultural insurance scheme supported by government subsidy. This presentation aims to draw some implication from the experience of Japan.
- Many arguments on “agricultural insurance” are regarded to food security through the protection of farmers from natural disasters under worrying climate change.
- But, my presentation tries to look at another function of agricultural insurance too.
- This presentation pay attention to two roles of agricultural insurance:
 - (1) food security;
 - (2) linking farmers to modern supply chains, e.g., higher-value urban markets and overseas markets under the commercialization of agriculture and globalization.

1. Important Points of Ag. Insurance for food security:

- To be resilient and sustainable scheme

Insurance can be affordable whenever severe crop failure happens.

- To ensure food production in the following seasons and years after a disaster.
- Small and vulnerable farmers can be compensated so to maintain their reservation level of income and to protect their farming continuity.

2. Linking farmers to modern supply chains

- World Bank has focused on the issue of bringing agriculture to the market in its report: in World Development Report 2008:
- Agriculture for Development. Chap.5 titled by “Bringing agriculture to the market” pointed as follows
 - ① Food : improving commodity trading and risk management
 - ② Traditional bulk export commodities: maintaining international competitiveness
 - ③ Higher-value urban markets: linking producers to modern supply chains
 - ④ Higher-value exports: meeting product standards
 - ⑤ Agribusiness for development.

(WDR 2008, pp.118-137)

- In Chapter 6: Supporting smallholder competitiveness through institutional innovations, WDR focuses on **Insurance to manage risk as an Institutional innovation.**
- **WDR** says:
 - “ in addition to enhancing the supply of agricultural credit, insurance can make potential borrowers more willing to bear the risk of conventional collateralized loans.
 - As always, there is a tradeoff.
 - Insurance is costly and leads to higher overall costs when added on to a loan.”
 - (WDR 2008, p.148)
- For accessing developing agricultural markets, farmers are required collateral to use credits, supplied by banking system.
 - In this case, insurance is expected to perform as an effective credit guarantee.
- We have observed some cases of non sustainable technical innovation due to the lack of agricultural insurance.
 - Indri Nugraheni and Keiichi Ishii (2017).
 - Dian Adi Anggraeni Elisabeth, Hitoshi Yonekura, and Nina Takashino (2013).

3.Objectives:

- To Introduce the AMR (Agricultural Mutual Relief: NOSAI) Insurance Scheme in Japan and extract lessons from it.

Viewpoints:

- (1)architecture, (2)organization and governance of scheme, (3)assessment of failure, (4)insurance policy & incentives.

Focusing points are:

- Mutual relief, partly compulsory and government support that make farmers participate the Scheme
- Farmers/ villagers are regarded as the critical human resources, not like clients of insurance business but as leading players (stakeholders)
- Linking with rural institutions to create ag. Insurance pool.

II. Architecture of the Agricultural Insurance Scheme (NOSAI) in Japan

World Bank Stance:----(WDR2008)

1. Defining government's role in agricultural insurance: The track record of agricultural insurance directly supplied by governments is not encouraging.
 2. MFIs cannot necessarily address moral hazard or adverse selection, two major obstacles to providing insurance.
 3. One innovation that might do so is insurance indexed to an objective indicator of weather, such as rainfall or temperature.
 4. Because weather is not affected by individual behavior, indexed insurance can address both monitoring costs and moral hazard.
- World Bank suggests the superiority of the weather index base insurance scheme. How about Japan, monsoon Asia?

In Japan

Weather Index has not been applied in Japan----however, keeping sustainability of crop insurances since 1947 and recently it is introducing income insurance program.

Characteristic of Risks and Insurance

Risks are diversified per:

(1) crop, (2) farm unit, block or limited territory, local area, nationwide etc., (3) time/ days, season, year, several years, etc. (4) different degree of impact on the production decrease.

Types of Insurance:

Crop Insurance:

MPCI (yield base), Named Peril (damaged base), Crop Revenue, Index based,

Livestock Insurance:

Various risks of Accident and Mortality, Index based, Epidemic Disease

Delivery Channels/ Stakeholders: unified by NOSAI (association) in Japan

Brokers, Insurance brokers, Stock agents and banks, Cooperatives and farmer's association,

(Cooperative is not necessarily elaborate but considered important delivery channels as "insurance agents.")

Farmer's Commitment: Voluntary vs. Compulsory

Damages: Named Perils

- Paddy and upland rice, wheat, barely
- Upland crops: potato, soybean, red bean, butter bean (haricot), sugar beet, sugar cane, tea (first reaping), buckwheat, sweetcorn, onions, pumpkin, sericulture (cocoon)
- Livestock: dairy cow, grazing cow, horse, breeding pig, fattening pig
wind hazard, flood, drought, cool summer damage, snow disaster, other meteorological disasters (including earthquake, eruption, tsunami), fire, disease and insect damage, damages by wild life (beats and birds)
- Fruits and trees: oranges, apple, pear, grape, persimmon, chestnut, ume plum, plum, loquat, peach, kiwi, pineapple
Fruits trees: dried death, washout, loss, lie buried, depredation, etc. caused by meteorological disasters
- Greenhouse: glass greenhouse, PVC greenhouse, weather shed (rain cover)
wind hazard, flood, drought, cool summer damage, snow disaster, other meteorological disasters (including earthquake, eruption, tsunami), fire, burst/explosion, crash or minor collision of aircraft, fallen matters from aircraft, clash or minor collision of automobile/ its loaded matters, pest and disease, damages by beats and birds

Availability of Crop and Livestock Insurance in Selected Developed and Developing Economies

Table Availability of crop and livestock insurance in selected economies					
Country	Crops (peril)	MPCI	Revenue	Live stock	Index-based
Subsidized					
Austria	x	x		Mortality	
Canada	x	x	X	All risk	Crops
Cyprus	x				
Czech Republic	x			Mortality	
France	x	x		Mortality	
Israel	x			Mortality	
Italy	x	x		Mortality	
Japan	x	x		All risk	
Portugal	x	x			
Slovenia	x			All risk	
South Korea	x	x		Mortality	
Spain	x	x		Mortality	Crops
Switzerland	x	x		Mortality	
United States	x	x	X	Price/Margin	Crops, rangeland
Philippines	x	x		Mortality	Crops

Source: Celia M. Reyes et al., 2017.
 Note: x means in point. MPCI: multi-peril crop insurance.

Architecture of the AMR Insurance Scheme in Japan

- The scheme starts as the local farmers' cooperative action to establish a joint reserve fund by accumulating the contributions as premium for the purpose of making up for the loss.
 - This is the insurance by the Agricultural Mutual Relief (AMR) Associations or municipal governments.
- Because of the vulnerability of the agriculture in its nature, the risk cannot be adequately dispersed within the limit of local communities or even prefectures. Therefore, this **insurance program is operated as a device of dispersing risk**, in which
 - (1) liabilities by the AMR Associations and the municipal governments are
 - (2) reinsured by their prefectural federation, and further,
 - (3) the federations' liabilities are re-reinsured by the national government.
- Strict mandatory control:
 - Only legal bodies commit to the insurance scheme in-between individuals and the central government. Voluntary base body without legal status can't commit. This is to avoid moral hazard and adverse selection.

Predominant Feature of NOSAI Scheme

- Mutual relief system committed by farmers themselves
- Coverage: Production risk only, market and management risk are not insured. It is not too much ambitious
- Agricultural Insurance Penetration: about 60 % of agricultural outputs



Three dimension of Government Subsidy

- (i) Subsidies on premiums to farmers: 50% premium is subsidized
- (ii) Operational subsidies to insurers to cover some of the high administrative costs associated with underwriting insurance contract; and
- (iii) Reinsurance: 100% insurance liability is guaranteed by reinsurance



Sustainable base is maintained by government support

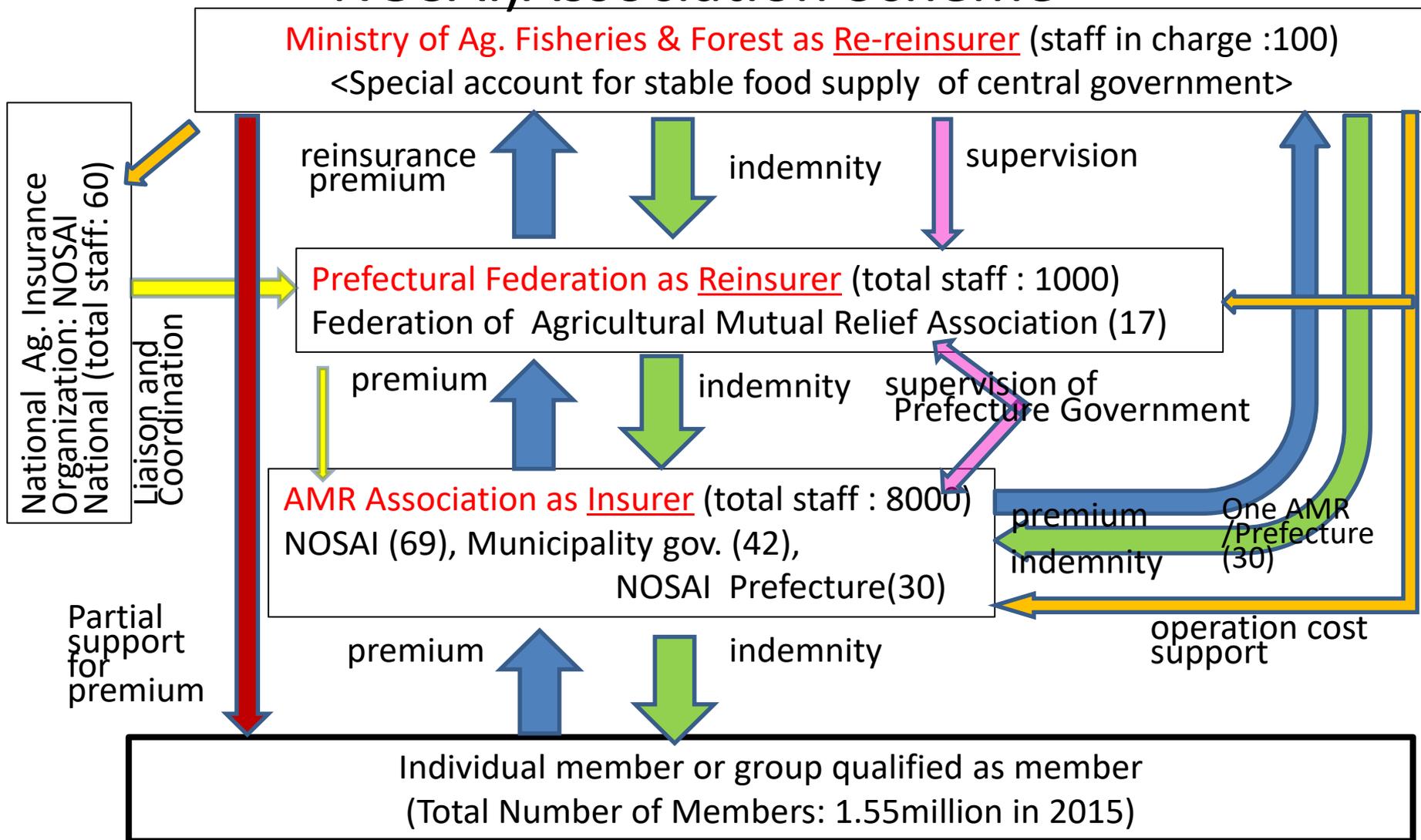
Agricultural Mutual Relief Insurance Scheme (NOSAI) in Japan

	農業共済 Insurance of Agricultural Mutual Relief (AMR) Associations	農協の共済 Insurance of Agricultural Co- operative
Law	農業災害補償法 the Agricultural Disaster Compensation Law (Law No.185 of 1947)	農業協同組合法 Agricultural Co-operative Law
Program	Rice, wheat and barley Livestock Fruits and their trees Upland crops, Sericulture Greenhouse Houses (short term: non-refundable) , Equipment /Machines(short term non- refundable or savings-type insurance)	Human life, Mobiles, Houses (long term)
Participation	Rice and other grains: compulsory Others: compulsory or voluntary	Voluntary
Government support for premium	40~55%	Non
Implementing Institution	NOSAI (AMR Association)	JA (Japan Agri. Cooperatives)

III. Organization and Performance

- An agricultural insurance pool could act as a risk aggregator, providing farmers and herders with affordable and effective agricultural insurance that is financially sustainable in the long term without heavy public subsidies. (Mahul and Stutley, 2010, p.163)
- NOSAI seems to be an “Agricultural Insurance Pool” backstopped by the government support.
but, it needs big amount of gov. subsidies.

Organization of AMR (Agricultural Mutual Relief: NOSAI) Association Scheme

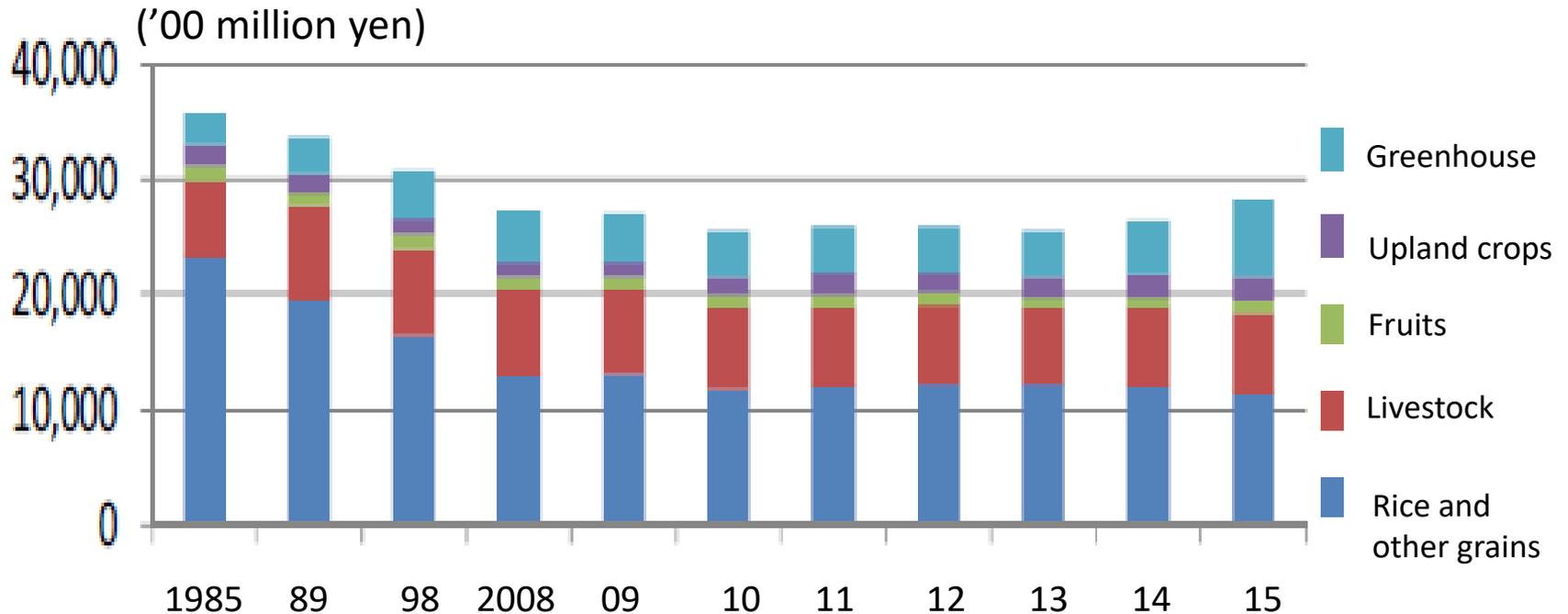


Source: NOSAI homepage and MAFF processed by author.

Note: Number of staffs as of 2007. Number of associations/ federation as of 2017.

Coverage of Insurance

- Insurance: max amount about 2.8 trillion yen equivalent to approximately 60% of total value of agricultural products.
- Rice, wheat and barley share about 40% over total insurance. Livestock shares about 30%.



Source: MAFF (Ministry of Agriculture, Forestry and Fisheries).

- Rice, wheat and barley share about 40% of total insurance. Livestock shares about 30%.
- The participation rate of insurance:
rice and the other grain crops, dairy cattle:
high rate more than 90%

Item	Rate of insuring (%)
Paddy rice	92
Wheat and barley	98
Dairy cattle	93
Beef cattle	67
Fruits(harvesting)	24
Upland crops	70
Green house	47

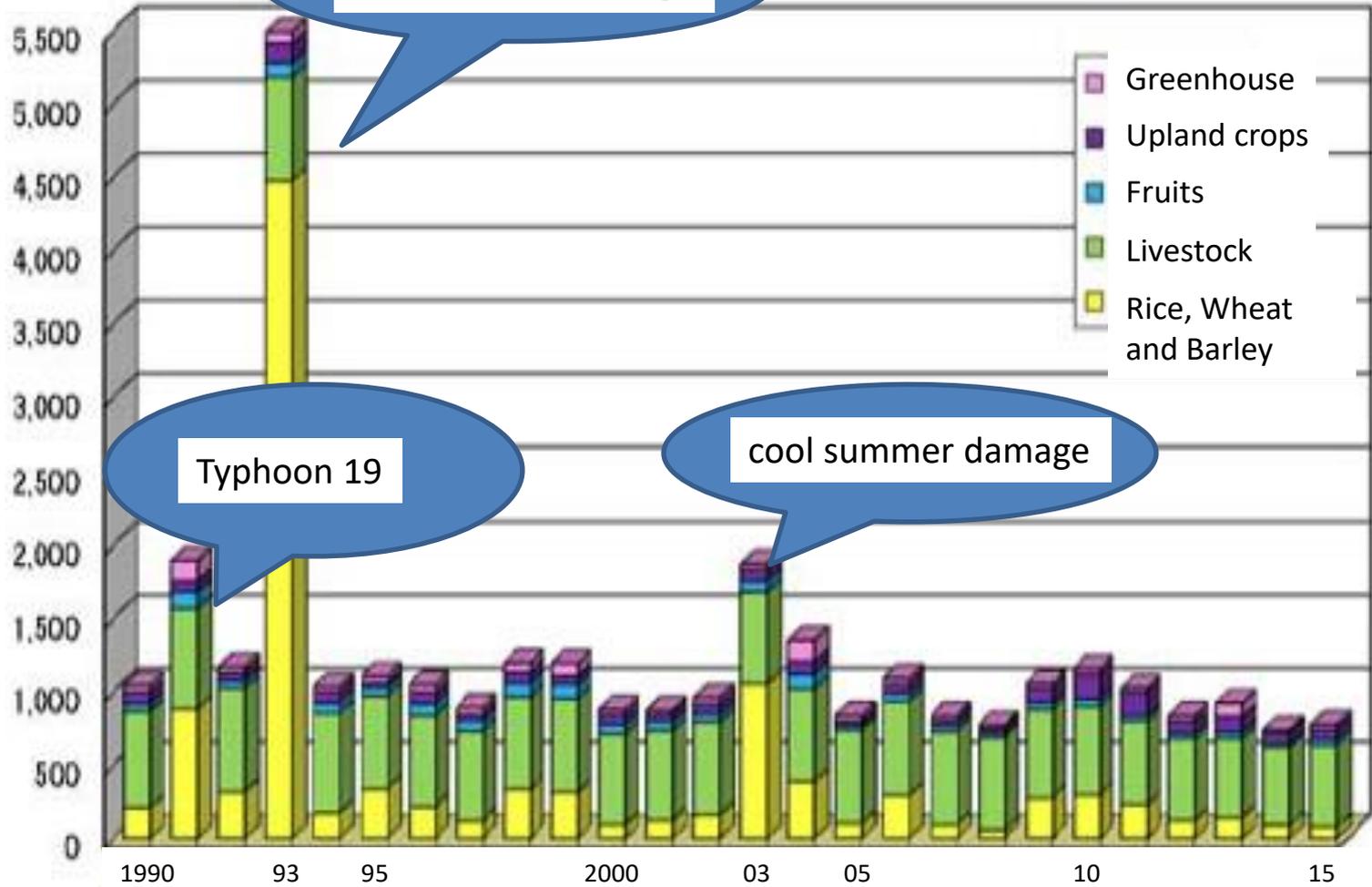
Compulsory Participation for the AMR

Territory	Aim of AMR	Minimum area (ha)
Prefecture	Paddy rice	0.2 ~ 0.4
	Upland rice, Wheat, Barely	0.1 ~ 0.3
Hokkaido	Paddy rice, Upland rice	0.3 ~ 1.0
	Wheat, Barely	0.4 ~ 1.0

Note: Farmers who cultivate more than the minimum area are obligated to join the AMR scheme. The minimum area is fixed by the governor of each prefecture.

Disbursement of Indemnities

'00million yen



Year 1990-2015

Source: MAFF.

IV. Insuring Method of Insurance Policies

- Practical to ensure yield rather than “yield loss”
- Insurance policy is selective.

Disasters often attack in various diversified manner, by plot , etc.

Helpful for farmers to mitigate the mal impact of disasters.

- Recent days farm income compensation is being introduced under the development of book keeping and tax collection system.

Menu of Insurance Policy by Program

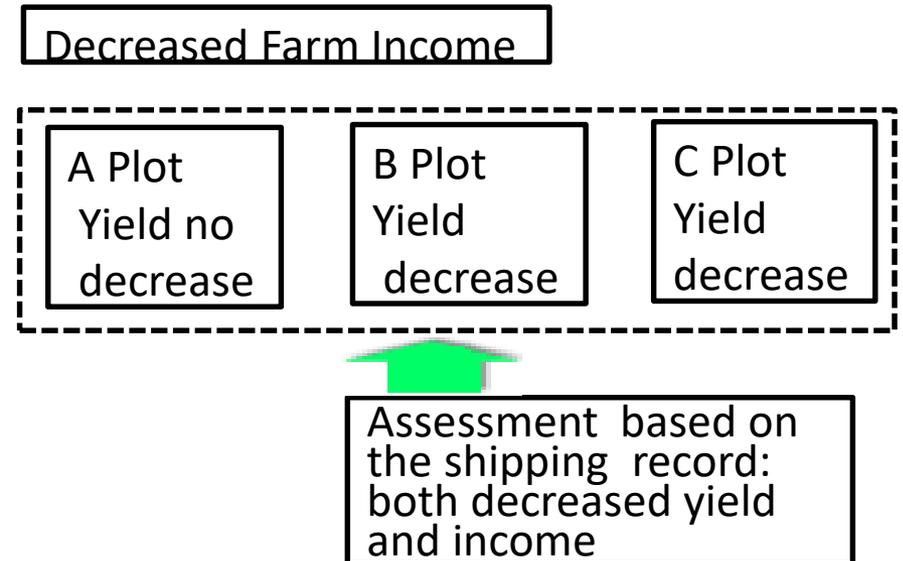
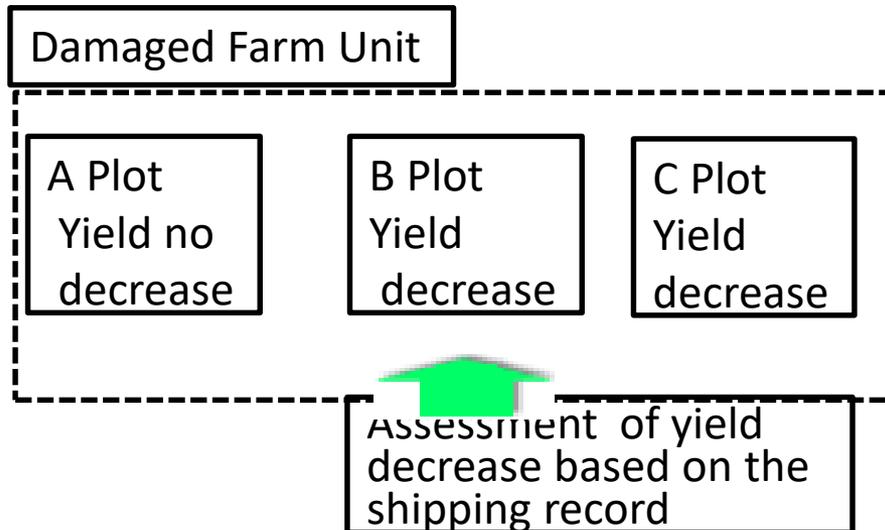
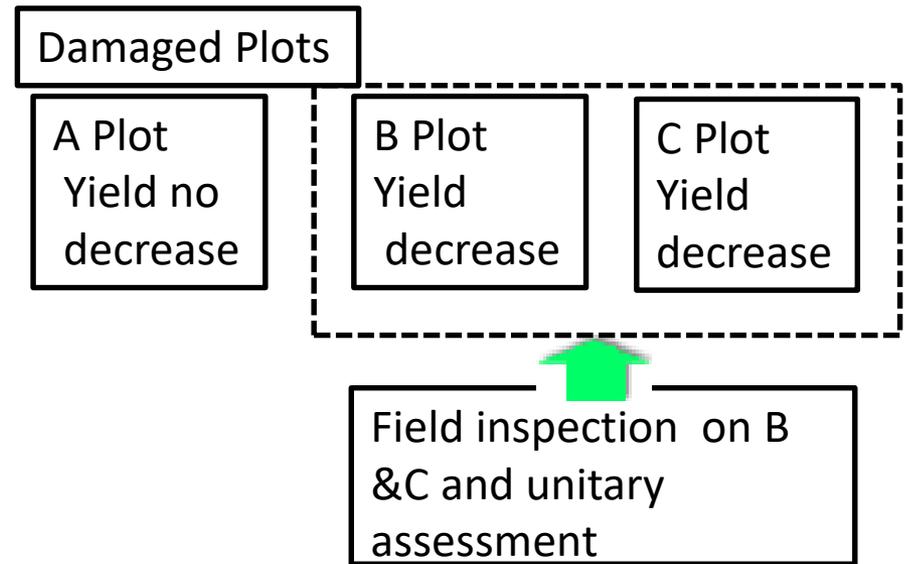
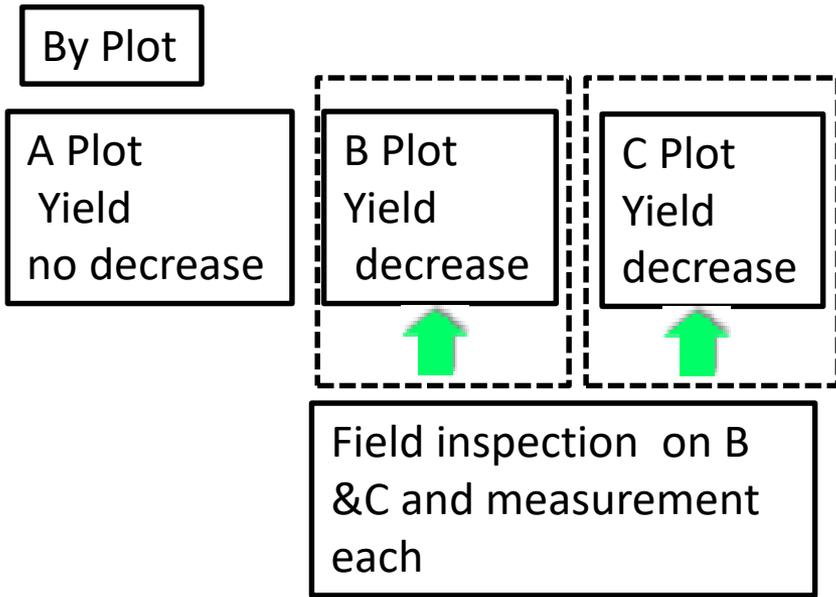
Insuring Method	Program Rice , wheat and barely	Fruits	Upland Crops (fixed by each crop)	
			e.g. Soybean	e.g. Sugar beat
Yield by Plot	○	○	○	
Yield by Damaged Plots	○	○	○	
Yield by All Plots of a Farm	○	○	○	○
Decreased Farm Income	○	○		

Source: MAFF.

Note: ○ means under coverage.

Assessment of Damage by Insuring Method: Example of A Farm with Three Plots

Source: MAFF.



Option of the Guaranteed Yield by Insuring Method: Paddy Rice

Insuring Method	Guaranteed Yield (or income) (%)	Premium (yen/10 are)
Yield by Plot	70	264
	60	160
	50	93
Yield by Damaged Plots	80	379
	70	188
	60	97
Yield by All Plots of a Farm	90	735
	80	351
	70	184
Decreased Farm Income	90	858
	80	355
	70	163

Source: MAFF.

Preference of Insuring Method by Members

(%: in 2015)

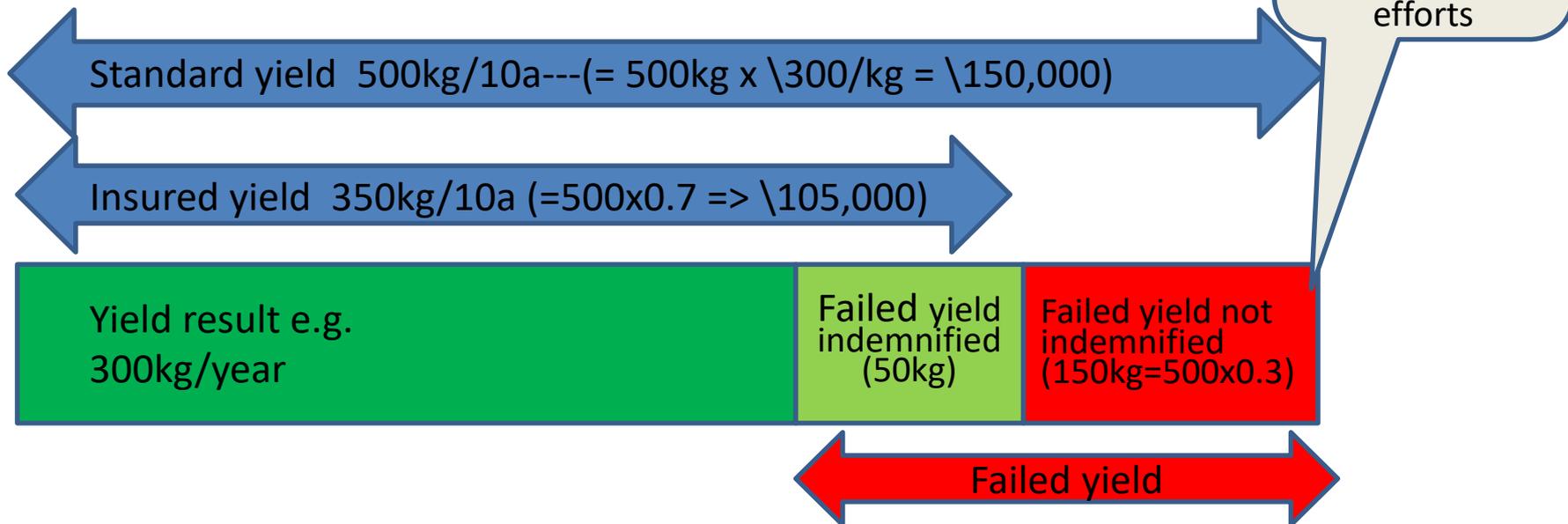
Insuring Method	Rice and other grains			Fruits			Upland Crops	
	Paddy rice	Wheat, barley	Total	"Unshyu" orange	Apple	Total	e.g. Soybean	Total
Yield by Plot	79	7	68	-	11	10	15	6
Yield by Damaged Plots	9	0	8	34	89	62	3	10
Yield by All Plots of a Farm	9	10	9	0	-	2	83	84
Income by Farm Unit	3	84	15	65	-	26	-	0
Total	100	100	100	100	100	100	100	100

Source: MAFF.

Note: "Unshyu" orange is the most popular orange in Japan

Calculation of Indemnity: Paddy Rice Per Plot

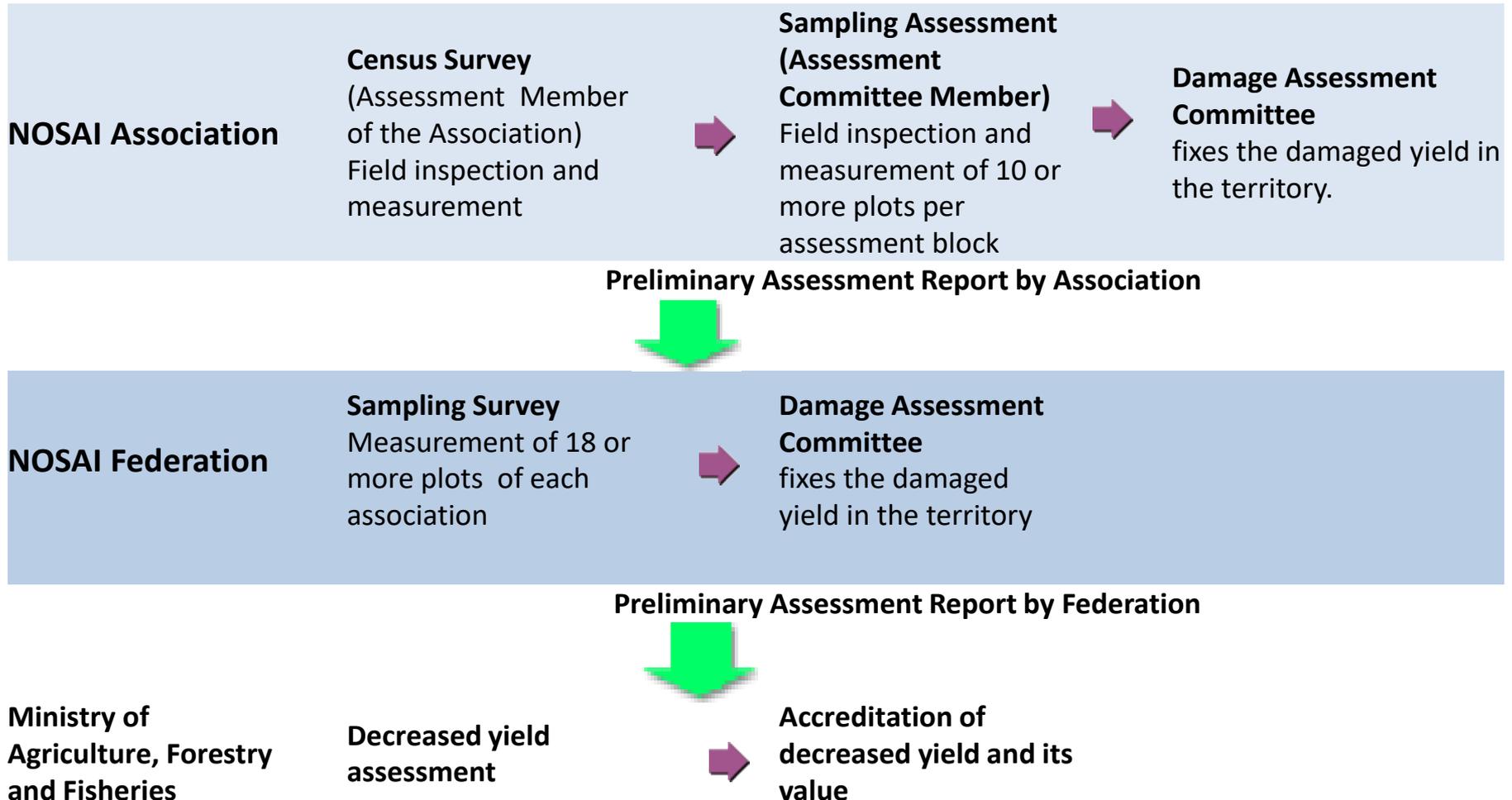
Guaranteed level of crop failure: 70% of standard yield (other options: 60%, 50%),
Unit value of insurance $\backslash 300/\text{kg}$ (fixed by insurance policy),
Standard-yield 500kg/10are, and
Actual yield 300kg.



V. Mechanism for Reducing Moral Hazard and Adverse Selection and Its Government Cost

- Procedures for Approval & Settlement of Claims → see figure
 - ① claim from members ---- peer monitoring/ assessment of damages,
 - ② double assessment at an association level
peer monitoring of members + random survey by association staff
 - ③ triple assessment: association level, federation level and national level
- The assessment at the association level has been operated in a manner of voluntary and peer.
- Individuals and legal bodies are allowed to commit to the AMR (NOSAI) Scheme. Non-legal body can join the scheme but it must be legally qualified by AMR.
- Experiences of 70 years: sustainable operation has been maintained
- Problem: This operation, however, become difficult due to the depopulation of farmers and aging of them.

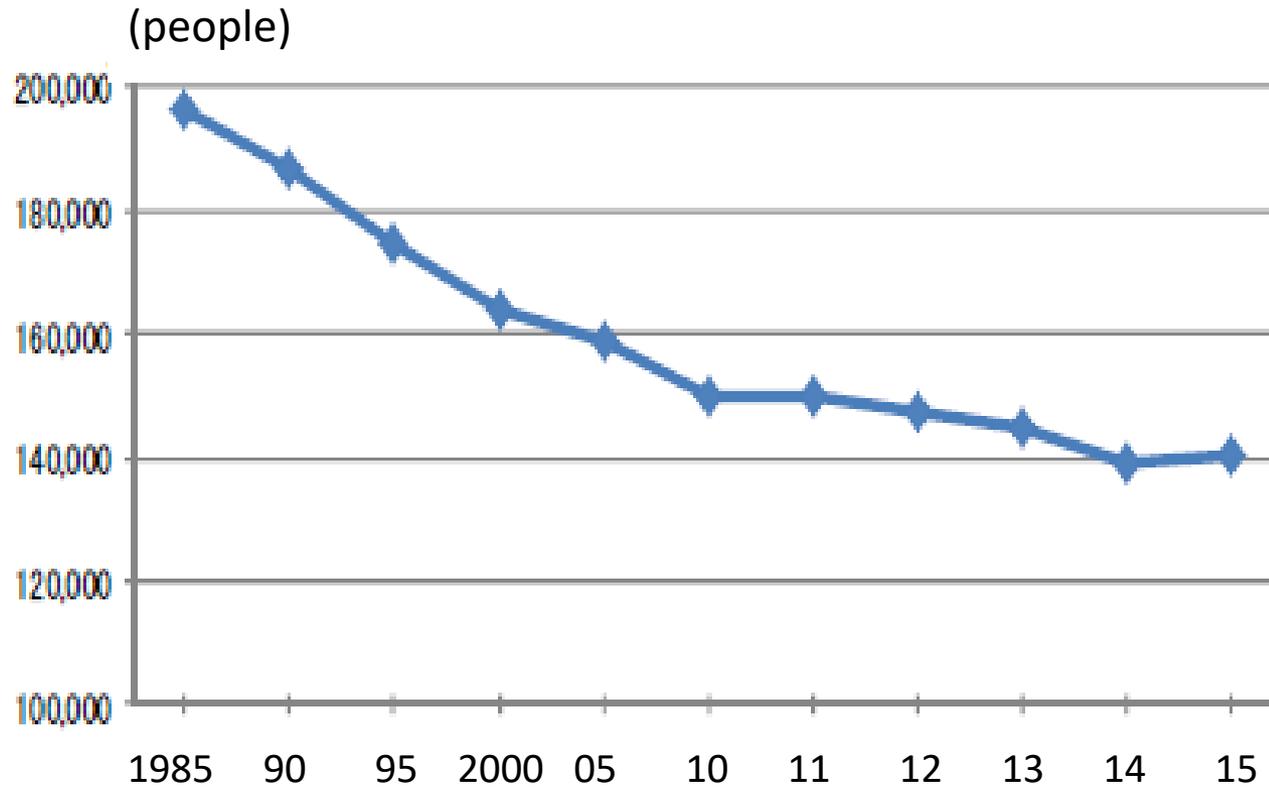
Claim System



Source: NOSAI homepage.

http://nosai.or.jp/nosai_kasou/nosai_page05.html (in Japanese).

Depopulation of Members for the Damage Assessment



Source: MAFF.

Qualified non-legal body can join the AMR Scheme

- Member of AMRA must be individual farmers.
- A certain farmers group, although not individual nor legal body, can be eligible as a member of the AMR association.

Qualification:

- It has the mandate and regulates the rule of premium payment and distribution of received indemnities.
- All group members must live within the territory of the AMRA.
- Program is opened only for the farmers of rice, wheat and barley, upland crops and fruits.

This is very essential to identify the locus of responsibility and avoid the diffusing responsibility at the time of damage and default of farm economy.

Qualified Group Participating the AMR	Member of Qualified Group
Rice, Wheat and Barely	4,074
Fruits	17
Upland crops	1,440
Total	5,531

Insurance brokers can not work to get rent seeking.

Increasing the group participation may be caused by the development of *Syurak-einou* (of rural community farming , etc.)

Indemnities of Agricultural Insurance in 2015

		The number of damaged farmers ('000 farmers/heads, contracts)	Indemnities (million yen)	Reinsurance: Indemnities subsidized by the government (million yen)	Loss Ratio (Indemnity/Premium)	Damage Rate (Indemnity/Insurance) (%)	
Rice, wheat and barley insurance	Paddy rice	51	5,306	1,065	0.571	0.5	
	Upland rice	0.03	3	1	1.500	15.0	
	Wheat and barley	15	2,833	92	0.272	2.6	
	Total	66	8,142	1,158	0.413	0.7	
Livestock insurance	Life insurance (thousand heads)	Dairy cattle	149	18,611	9,305	0.978	11.9
		Beef cattle	58	7,404	3,710	0.923	4.7
		Horse	1	461	230	0.961	3.3
		Breeding pig	4	196	98	0.820	2.5
		Fatting pig	173	1,489	745	0.827	7.3
		Total	385	28,161	14,088	0.955	7.7
	Health insurance (thousand contract)	Dairy cattle	1,323	17,182	3,511	*	*
		Beef cattle	1,051	9,860	1,857	*	*
		Horse	14	212	33	*	*
		Breeding pig	7	50	10	*	*
		Fatting pig	--	--	--	*	*
		Total	2,395	27,304	5,411		
Fruit and fruit-tree insurance	Fruits	16	4,928	2,452	1.146	5.1	
	Fruit-tree	0.2	48	1	0.960	0.9	
	Total	16	4,976	2,453	1.131	4.9	
Upland crops insurance	Fields crops	21	5,219	2,015	0.405	2.6	
	Seri culture	0.02	1.5	0.5	0.500	1.5	
	total	21	5,220	2,016	0.405	2.6	
Greenhouse insurance ('000 houses)		27	3,316	511	0.518	0.5	
Total		--	77,119	25,637	0.761	2.7	

Source: MAFF and author's calculation.

Performance of the Scheme

in normal year (in 2015): varied by insured item/ program

Loss Ratio (Indemnity/Premium) average 0.761

Damage Rate (Indemnity/ Insurance) average 2.7(%)

Budget for the AMR Scheme Implementation (’00 million yen)

	2011	2012	2013	2014	2015	2016	2017
AMR Budget Total	91,103	89,345	89,199	89,136	89,023	88,589	88,235 (100%)
Government share of Premium (/ indemnity)	50,110	50,110	50,110	50,110	50,110	50,110	50,110 (56.8%)
Operational cost of AMR	40,285	38,685	38,585	38,525	38,425	38,025	37,689 (42.7%)

Source: MAFF

Note: The government share of Premium is, in principle, 50% of total premium.

Revenue and Expenditure of the Central Government: Surplus - -> Re-reinsurance Special Account

(Unit: million yen)

Program Account	Cumulative total for fiscal	2001	2002	2003	2004	2005	2006	2007	Cumulative total for fiscal
	1947 to 2000								1947 to 2007
Agriculture: Rice and the other grain	9,877	32,368	27,622	-58,277	-2,709	22,870	10,596	19,993	62,339
Livestock	28,141	1,353	331	257	512	2,280	-129	1,995	34,740
Fruits and Fruit-tree	-38,993	1,844	2,483	1,263	-3,503	2,580	1,057	1,528	-31,741
Green house	13,432	1,193	714	874	-3,182	649	808	1,174	15,661
Total	12,457	36,758	31,150	-55,883	-8,883	28,379	12,331	24,690	80,999

Source: NOSAI Japan home page.

http://www.nosai.or.jp/nosai_kasou/nosai_eng_07.html 2017.7.26

Reform under the Era of Globalization

From crop insurance to income insurance

- declared income: blue form for income tax (*Ah-oiro Shinkoku*) is required although suffering from 9-6-4 (*Kuroyon*) problem.
- Farmers must become blue return taxpayer.

This can be in line with improvement of the effectiveness and efficiency of tax collection system.

This can be expected to promote to prevent moral hazard and adverse selection through precise assessment of damages in term of income.

VI. Summary and Implication of the AMR Scheme

Features of NOSAI (AMR) Scheme of Japan could be worthy of consideration for further development of agricultural insurance scheme in Indonesia

1. Mutual relief principle: ownership of the scheme is restored to member farmers
2. Architecture, organization and policy options of AMR to reduce moral hazard and adverse selection: ① peer monitoring, ② policy options fixed by member him/herself and ③ non-indemnified part as for incentive, ④ multilayered damage assessment, ⑤ Individuals or mandated-groups; eligible as member of the NOSAI scheme.
3. Reinsurance mechanism by the AMR federation and the central government: resilient and sustainable insurance even hit by sever disasters (cool summer, foot-and-mouth epidemic)
4. Budgetary sustainability for 70 years: coverage is not ambitious, major programs were limited and has extended step by step.
5. Credibility of the scheme: contribute to the business continuity by linking with banking system.
6. Forming an agricultural insurance pool sustains the scheme: AMR members, municipality (village) government, AMR and its Federation, the central government, banking system and other human resources.

Implication Extracted: My Concerns

- Where is the ownership of the scheme in Indonesia? A farmer as a contributor of food security is just a client of insurance business or someone else?
 - ① Mutual self insurance is the fundamental principle of the scheme in Japan.
 - ② Collaboration with municipalities in Japan: even as an association and/ or federation member
- Sustainability: ensuring the scheme after finishing the project phase.

In Indonesia, no village administration/ municipality administration is used. Only nation wide administration instrument, e.g., extension workers, commit the project.
- Can mitigate the damage even at sever disasters? Determined reinsurance system?
- Legal status of farmers group, *kelompok tani*, *gapoktan*, is mandated by written document?
- Linking with agribusiness/ supermarkets: under the commercialization of agriculture, e.g., vegetables, fruits, and livestock that aspire new urban markets or overseas markets must confront higher business risk.

When farmers can not make the shippin weight and quality of crops set by the contract, penalty could be charged to the farmers.
- Can banking system accreditate the insurance as collateral?

If yes, agricultural insurance scheme is expected to mitigate such business risk at the case of default caused by disasters .
- Outside resources: extension workers, facilitators for rural development (e.g., BUMDesa), municipality (village) administration, rural financial institutions (eg., BRI Unit Desa), budget for the insurance schemes/ projects, etc. There seems no Agricultural Insurance Pool.

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Thanks