Don’t accumulate but integrate farm components for higher profits.

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Summary
We analysed the effect of the integration of farm components on income in two zones of the Vietnamese Mekong Delta, with data from 144 interviews. Next to the farm area, the number of farm components providing cash income to the household contributed significantly to the level of well-being and to the cash income that farmers derived from agriculture. The integration of components in the hills was hampered by the distance to the fields and a small homestead, and in the delta by a small total farm area. The total number of components and the components providing cash determined two clusters of gross income from agriculture.

Keywords: Vietnam, income, integration, agriculture, aquaculture.

Introduction
Specialised industrial agriculture arises concern for ecological, economic and social sustainability. Mixed farming systems might have the potential to maintain ecosystems’ functions and to absorb shocks of the natural and economic environment (Holling, 1995; Luu, 1999). Inversing the global trend towards specialisation might be feasible if integration gives higher profits. Contrary to the global trend of specialisation, in Asian countries like e.g. Viet Nam, integrated aquaculture agriculture farming systems (IAAS) emerged (Prein, 2002). Since 1986 the Vietnamese family farms in the Mekong Delta (MD) changed from systems producing mainly rice for marketing to IAAS marketing a large variety of products (Nhan et al., 2003). Was this diversification a mere accumulation or an integration for higher profits?

Materials and Methods
Choice of study site
We sampled in the two agro-ecological zones in the MD where IAAS can be found: the fresh water alluvial zone (delta) and the zone with hills and uplands (hills). In the delta, we included three hamlets of an existing sample representing the agro-ecological variation that had been selected for having a land-use policy allowing the development of IAAS (Phong et al., 2004). The hill zone is mainly located in the districts Tri Ton and Tinh Bien at the border with Cambodia, where we retained three hamlets that had dominantly rain-fed agriculture.

Sampling and data collection
In the six hamlets we selected 24 farm households through proportional random sampling after stratification in three categories of well-being: poor, medium, and better-off. During on-farm interviews with the head of the household or his wife, we collected the resource flows, standard farm characteristics, and information on cash income from the farm components.

Data analyses
Farm characteristics and descriptive information were entered in a database (MS-excel). The extent of the integration of various components was quantified by assigning the value 1 to each flow between two components: e.g. when rice bran was fed to pig a value 1 was attributed to the flow field-livestock, when manure was returned to the field the total value became 2. The cumulated values represent an Indicator for the Integration of Components (IIC). The income was distinguished in net cash from: on-farm activities (CAF) and off- and
non-farm activities (CON). Statistical analysis, including the non-parametric Spearman’s rank correlation (rho = r) and a two step cluster analysis, were done in SPSS (version 12.0).

Results and Discussion
The participatory wealth ranking for the sampling procedures was corroborated by a positive correlation coefficient of the 3 classes of well-being with the total income (r=0.4; p<0.01). The rank of well-being was related to the family farms’ total land area (r=0.43; p<0.01) and the CAF (r=0.45; p<0.01). In the delta 58% of the families earned from both CAF and CON and in the hills 36% had both; mean CAF and CON were close to 12 x10^6 and 6 x10^6 VND yr^-1, respectively. The total farm area and the number of components contributing to cash income (CCI) were the only factors explaining the variation in CAF significantly. The average total farm area was 1.0 ±1.8 ha in the delta and 2.1 ±2.3 ha in the hills.

![Figure 1: The average total net cash income of agriculture (million VND/year) as a function of the Number of Components (NC), the Indicator for Integration of Components (IIC) and of the number of Components contributing to Cash Income (CCI), in the two zones of the Mekong Delta.](image)

The average number of farm components (NC), the IIC and the CCI were all significantly higher in the delta than in the hills: respectively 5.5 vv 3.8; 4.5 vv 2.5; and 3.7 vv 2.7 (p<0.001). The CCI was positively correlated to the rank of wealth (r =0.4; p<0.01) in both delta and hills, and the NC and the IIC in the delta only (r =0.3, p<0.01). In the delta both IIC and CCI correlated significantly to the CAF (r =0.3; p<0.01), but in the hills the CAF was correlated significantly to the CCI only (r =0.3; p<0.05). The NC and CCI determined 2 distinct clusters of CAF: 15.2 ±1.6 and 10.0 ±1.2 x10^6 VND yr^-1. In general farms having at least 3 CCI performed better (Figure 1). In the hills the farm size and the distance between homestead and fields dominated the effect of the IIC; the correlations were r = 0.3 (p<0.01) and r = - 0.3 (p<0.05), respectively. Especially in the delta, farms with an IIC of 4 and higher had a higher income. Only in the delta the correlation between the farm area on the one hand and the IIC and CCI on the other were significantly positive (r =0.3, p<0.01).

References